The 5th International Conferences on Agriculture and Life Sciences (ICALS)

ABSTRACT BOOK

Accelerating Transformation in Industrial Agriculture Through Sciences Implementation

Jember, Indonesia
November 3rd - 4th, 2021

Organized by

Faculty of Agriculture
University of Jember

IsDB
البنك الإسلامي للتنمية
Islamic Development Bank

Pusat Unggulan Ipteks Perguruan TInggi
Bioteknologi Tanaman Industri
(PUI-PT BioTin)

ABSTRACT BOOK

THE INTERNATIONAL CONFERENCE ON AGRICULTURE AND LIFE SCIENCE 2021

November 3th-4th, 2021
Jember, East Java, Indonesia

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Dr. Ir. Iwan Taruna, M.Eng, IPM. (Rector University of Jember)

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Foreword from Chairman Committee ICALS 2021

Assalamualaikum Wr. Wb.

First and foremost, it is my great pleasure to welcome all of our distinguished forum guest and invited speakers, presenters, and participants of the 5th International Conference on Agriculture and Life Sciences 2021 (ICALS 2021). It is an ongoing effort by the Faculty of Agriculture University of Jember, starting from 1st ICALS as International Seminar and Workshop of Plant Industry (ISWPI) on 2017, the International Seminar and Workshop of Plant Industry (ISWPI) on 2018, 3rd International Conference on Agriculture and Life Sciences (ICALS 2019) on 2019, and 4th International Conference on Agriculture and Life Sciences (ICALS 2020) on 2020.

1. The ICALS is proudly co-organized with Faculty of AgricultureUniversity of Jember, Graduate Program University of Jember, Implementation Programs Unit of Islamic Development Bank University of Jember, and Center of Excellence on Crop Industrial Biotechnology (PUI-PT-BioTIn).
2. In this ocassion, I would like to inform you that this event consists of three programs including webinar series that have successfully held on the last month, the International seminar that start from today until tomorrow, and workshop of organic farming for sustainable agriculture that will be held on the day after tomorrow. The International seminar presents keynote speakers, from the University of Jember and from the Ministry of Agriculture, Republic of Indonesia. Also, the guest and invited speakers from China, Malaysia, Philipines, Germany, France and Indonesia also will participate in this conference to share their knowledge and expertise.

ICALS 2021 is remotely attended by 1262 participants from academician, researchers, students, farmers, private business, governments in Indonesia. Among this number, 216 participants will disseminate their scientific result related to this conference topic, "*Accelerating Transformation in Industrial Agriculture Through Sciences Implementation* "

Last but not least, I would like to express blessed gratitude to our University for their support to this conference and also, a heartfelt wish to all the committee involved in ICALS 2021, without you, ICALS 2021 will not be a reality.

Representing the organizer, I proudly welcome all of you at ICALS 2021. Wishing all participants, fruitful and memorable experience for these two (2) days.

Thank you.

Wassalamualaikum Wr. Wb.

Dr. Ir. Didik Pudji Restanto. M.S.
The ICALS 2021 Chair

SCHEDULE OF ICALS 2021

"*Accelerating Transformation in Industrial Agriculture Through Sciences Implementation*"

Wednesday, November 3th, 2021. International Conference Symposium and Plenary session
Join Zoom Meeting

Time (GMT+7)	Program	Remarks
07:30 - 08:00	**Preparation**	**HOST :** Tri Handoyo, S.P., Ph.D **Co-Host:** Student
08:00 - 08:25	**Opening Ceremony**: University of Jember and Faperta National Anthem "Indonesia Raya" Hymne University of Jember Mars Faculty of Agriculture Report by General Chairman of ICALS Welcoming remark by Dean Faculty of Agriculture Prof. Dr.Ir. Soetriono, M.P Welcoming remark by Rector of University of Jember Dr. Ir. Iwan Taruna, M.Eng.	**MC**
08:30 - 08:35	Pray	Ahmad Zainudin, S.P., M.Si
Symposium Session		
08.35 - 09.20	**Keynote Speaker 1** Dr. Ir. Iwan Taruna, M.Eng. Rector of University of Jember **Title**	**Moderator:** Ir. Kacung Hariyono, MS. Ph.D. **Notulen:** Dr. Desy Cahya Widianingrum, S. Pt.
09.20 - 10.05	**Keynote Speaker 2** **Ir. Gatut Sumbogodjati, MM.** Director of Processing and Marketing of Food Crops Title	
Plenary Session I		
10.05 - 10.50	**Guest Speaker 1** **Prof Peng Zhang** Shanghai Center For Cassava Biotechnology (Sccb), China **Undestanding the starch boliosynthesis in root crop towards breeding application** Discussion	**Moderator:** Hardian Susilo Addy, S.P., M.P., Ph.D **Notulen**: Ika Purnamasari, S.Si., M.Si.
10.50-11.35	**Guest Speaker 2**	

	Prof Alexander Flor University of The Philippines Open University **Socioeconomic Dimensions of Farmer-Smart Agriculture in The Fourth Industrial Revolution.** Discussion	
11.35-12.45	Break	Commitee
Time (GMT+7)	**Program**	**Remarks**
Plenary Session II		
12.45 – 13.30	**Guest speaker 3:** **Prof. Tri Agus Siswoyo, S.P., M.P., Ph.D** University of Jember **The tandem-repeat strategy for high yield peptide production** Discussion	**Moderator:** Wahyu Indra Duwi Fanata SP., M.Sc., Ph.D. **Notulen:** Melinda Erdya Krismaputri, S. Pt., MSc
13.30-14.15	**Guest Speaker 4:** **Sebastien CUNNAC** France **Crop Protection by Advanced Biotechnology** Discussion	
Plenary Session III		
14.15-15.00	**Guest Speaker 5:** **Prof. Dr. Velavan** Institute of Tropical Medicine, University of Tübingen, Germany **Agricultural products for the prevention and treatment of covid-19** Discussion	**Moderator:** Ir. Jayus, Ph.D. **Notulen:** Nurul Dwi Novikarumsari, S.P., M.Si.
15.00 – 15.15	Closing for day 1	**MC**

SCHEDULE OF ICALS 2021

"*Accelerating Transformation in Industrial Agriculture Through Sciences Implementation*"

Thursday, November 4th, 2021. Main Room (Room A)
Join Zoom Meeting

Time (GMT+7)	Program	Remarks
06.30-07.00	**Preparation to Main Room**	Committee **HOST ROOM** **A.** Rizki Hidayatullah MC
Parallel Session		
Preparation to Plenary Session		
Plenary Session IV		
12:00 – 13:00	**Preparation to Main Room**	
13.00 – 13.45	**Guest speaker 6:**	**Moderator:** Tri Handoyo, , S.P., Ph.D **Notulen:** Suci Risfiyana, S.T.P., MSc.
	Prof. Fahrul Zaman Huyop	
	Universiti Teknologi Malaysia	
	Micro-Molecular biology method for understanding pollutant degradation from the perspective of dehalogenases	
	Discussion	
13.45-14.30	**Guest Speaker 7:**	
	M. Rondhi, SP, MP, Ph.D.	
	Universitas Jember	
	Title	
	Discussion	
14.30-15.00	Announcement and Closing	MC

SCHEDULE OF ICALS 2021

"*Accelerating Transformation in Industrial Agriculture Through Sciences Implementation*"

Thursday, November 4th, 2021. Room A "Agronomy and Plant Protection"

Time (GMT+7)	Program	Remarks
06:00 – 07:00	Preparation	Committee HOST ROOM A. Rizki Hidayatullah
Parallel Session		
07.00 – 12.00	Room (@10 minute, 7 minute presenting 3 minute discuss)	Moderator
	Room A.1: 25 Co-Host: Student	Widya Kristiyanti Putri, S.Pd., M.Si
	Room A.2: 25 Co-Host: Student	Suci Ristiana, S.Tp., M.Sc
	Room A.3: 27 Co-Host: Student	Ika Purnamasari, S.Si., M.Si.
12.00-13.00	**Break**	*MC*

Thursday, November 4th, 2021. Parallel Session Room B: "Biotechnology and Biomolecule"

Time (GMT+7)	**Program**	**Remarks**
06:00 – 07:00	Preparation	Committee **HOST ROOM B.** Oria Alit Farisi, S.P., M.P.
Parallel Session		
07.00 – 12.00	Room (@10 minute, 7 minute presenting 3 minute discuss) **Room B.1: 11** Co-Host: Student	Moderator Tri Ratnasari, S.Si, M.Si
12.00-13.00	**Break**	*MC*

Thursday, November 4th, 2021. Parallel Session Room C: "Agricultural Engineering and Technology"

Time (GMT+7)	Program	Remarks
06:00 – 07:00	Preparation Parallel session	Committee **HOST ROOM C.** Tri Handoyo, S.P., Ph.D
Parallel Session		
07.00 – 12.00	Room (@10 minute, 7 minute presenting 3 minute discuss) **Room C.1: 27** Co-Host: Student	Moderator Susan Barbara P. SM., S.Hut, M.Sc.
12.00-13.00	**Break**	*MC*

Thursday, November 4th, 2021. Parallel Session Room D: "Food Science and Smart Education for Plant Based-Diet"

Time (GMT+7)	Program	Remarks
06:00 – 07:00	Preparation	Committee **HOST ROOM D.** Dr. Laily Ilman Widuri, SP
Parallel Session		
07.00 – 12.00	Room (@10 minute, 7 minute presenting 3 minute discuss) **Room D.1: 20** Co-Host: Student	Moderator Himmatul Khasanah, S. Pt. M.Si
	Room D.2 : 13 Co-Host: Student	Dr. Luh Putu Suciati, S.P., M.Si
06:00 – 07:00	**Break**	*MC*

Thursday, November 4th, 2021. Parallel Session Room E: "Smart Social and Polities in Industrial Agriculture"

Time (GMT+7)	Program	Remarks
06:00 – 07:00	Preparation	Committee **HOST ROOM E. :** Ahmad Zainuddin, S.P., M.Si.
	Parallel Session	
07.00 – 12.00	Room (@10 minute, 7 minute presenting 3 minute discuss) **Room E.1 : 21** Co-Host: Student	Moderator Agung Sih Kumianto, S.Si., M.Ling.
	Room E2 : 15 Co-Host: Student	Ahmad Ilham Tanzil, S.P., M.P.
12.00-13.00	**Break**	*MC*

Thursday, November 4th, 2021. Parallel Session Room F: "Smart Business for Agriculture and Healthy Food"

Time (GMT+7)	Program	Remarks
06:00 – 07:00	Preparation	Committee **HOST ROOM F:** Dwi Erwin Kusbianto, SP., MP.
	Parallel Session	
07.00 – 12.00	Room (@10 minute, 7 minute presenting 3 minute discuss) **Room F.1: 28** Co-Host: Student	Moderator Distiana Wulanjari, S.P., M.P.
12.00-13.00	**Break**	*MC*

GUEST SPEAKER ABSTRACT

LIST OF GUEST SPEAKER ABSTRACT

Socioeconomic Dimensions of Farmer-Smart Agriculture in The Fourth Industrial Era

Alexander G. Flor
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Abstract

This paper presents a Farmer Smart Agriculture model most appropriate to the Fourth Industrial Revolution. It is both a concrete and original contribution to the industrial agriculture narrative .

Farmer Smart Agriculture or FSA is described as:

1. An approach to managing agricultural resources that enhances the farmer's abilityto maintain productivity by adapting to his environmental, economic and social circumstances with the welfare of his family foremost in mind. In FSA, sustainability is measured by the farm family's ability to adapt. FSA is pragmatic, it is guided by a sense of responsibility towards land as an intergenerational resource.
2. Transformative since it defines the dynamic relationship of the farm family to theirland. Ordinarily, industrial agriculture focuses exclusively on the science of land, water and air. FSA, on the other hand, incorporates traditional knowledge and practices for combating land degradation. While industrial agriculture highlights land management technologies, FSA emphasizes land management processes and its temporal and spatial dimensions.
3. Adopting the long-term perspective of responsible agriculture, it recognizes that land management considerations are not confined merely to the production of rawmaterials. Compared to conventional industrial agriculture, FSA includes the management of externalities such as off-farm and non-farm economic opportunities. It is not exclusively concerned with land degradation and rehabilitation but considers the functional relationships of land degradation/rehabilitation, crop yield and income that makes the farmer adopt thethree-tiered strategy of plot-field-landscape.
4. Considers seasonal variations in land degradation. It considers natural land degradation as landscape specific benchmarks.

The paper ends by proposing five skill sets for the agricultural extension worker, researcher and technician that would allow him/her to champion Farmer-Smart Agriculture and practice it effectively.

Understanding The Starch Biosynthesis In Root Crops Towards Breeding Application

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Abstract

Root crops such as cassava and sweet potato play critical roles in global food security and bioenergy development. Their storage roots accumulate large amounts of starch as reservoir for energy storage. Regulation of storage root development by source and sink strength remains largely unknown. Here, we present our recent studies in regulation of transient starch turnover, sugar (mainly sucrose) allocation and storage starch biosynthesis in cassava and cassava to facilitate our understanding of the "source-sink" relationship in root crops. Using the first T-DNA insertion cassava mutant, we revealed that the α-Glucan, water dikinase 1 regulates transient starch morphogenesis and storage root growth by decreasing photo-assimilation partitioning from the source to the sink and by starch mobilization in cassava. We also found that cell wall invertase 3 and sucrose transporter 1 regulate the sugar allocation from source to sink in vascular bundles to affect storage growth, which is promoted by the H+-pyrophosphatase activity. Since lignification affects storage root development and carbon fixation in storage root, identification of key transcription factors that regulate storage root development is in demand. We identified a NAC-domain transcription factor, IbNAC083, as a core regulator of storage root initiation in a dynamic network biomarker (DNB) analysis of transcriptomic dynamics during sweet potato root development. Further analyses and experiments showed that IbNAC083, along with its associated differentially expressed genes, induced dysfunction of metabolism processes, including biosynthesis of lignin, flavonol and starch, thus leading to the transition to swelling roots. Importantly, Outcrossseq platform was recently developed for identifying agronomically important genes in ploypoid sweet potato based on whole genome low-coverage resequencing of a large F1 hybrid population. We found that IbMYB1 coordinates phenylalanine pathway and NAC083-associated network to regulate storage development and starch accumulation. To reveal the regulatory mechanism of starch biosynthesis, interaction and regulation of starch synthetic enzymes complex in root crops were also studied to identify the key enzymes in charge of amylose and amylopectin biosynthesis. Based on these findings, novel germplasms with improved starch properties such as waxy and high amylose have been developed in cassava and sweet potato using RNAi or genome editing tools.

The Tandem-Repeat Strategy For High Yield Peptide Production

Tri Agus Siswoyo

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University of Jember, Indonesia

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Abstract

The angiotensin I-converting enzyme (ACE) plays a crucial role in regulating blood pressure and its inhibition is considered a treatment for hypertension. Cys-Met-Try-Leu-Ala-Ser-Gly (CMYLASG), a heptapeptide derived from Gnetum gnemon L. seeds, is an ACE-inhibitory peptide. This study aimed to investigate the expression of the tandem repeat heptapeptide gene (Gg-7pAH) and its ACE-inhibitory activity. The heptapeptide gene was cloned and expressed into the pBT7–N–His vector and synthesized as the recombinant protein Gg-7pAH. Sequencing results of the recombinant plasmid showed high similarity with the sequence of the heptapeptide genes inserted. The recombinant protein was expressed mostly as a soluble protein in Escherichia coli BL21 after 8 h of induction using isopropyl-β-D-thiogalactoside (IPTG) at room temperature around 26-28 ºC. Purification was achieved using Ni2+-chelate (Ni-NTA) affinity chromatography, which produced a 12 kDa recombinant protein. Hydrolysis of the recombinant protein with 2% formic acid released the heptapeptide as a target molecule. The hydrolyzed recombinant protein exhibited excellent ACE-inhibitory activity with an IC50 of 8.64 µM, which was lower than that of captopril (IC50 = 11.68 µM). Inhibitory kinetics showed that the heptapeptide was a non-competitive inhibitor of ACE and functioned suitably at low substrate concentrations. These findings revealed the high potency of the recombinant Gg-7pAH to produce ACE-inhibitory peptides that may be used as hypotensive agents and nutraceuticals for hypertension treatment.

Keywords: Temdem-repeat, Peptide, E.coli, Gg-7pAH, ACE-inhibitory

Micro-Molecular Biology Method For Understanding Pollutant Degradation From The Perspective of Dehalogenases

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Abstract

Pollutant biodegradation in the environment occurs in the context of various interactions among microorganisms. To reduce the pollutants present in the environmental media (i.e water/soil/atmosphere) the identification of functionally important populations by genomics, transcriptomics, proteomics and metabolomics to study the abundance, diversity, activity and functional potentials of indigenous microbial communities should be first assessed. Then it can be followed by isolation and laboratory pure-culture studies of the important organisms. These microorganisms are well suited for a such assessment because they respond fast to environmental changes, they have a huge taxonomic and genetic diversity, and they are actively involved in biogeochemical cycles. Such studies will shape a deeper understanding of the pollutant degradation and facilitate the development of new bioremediation strategies.

Here, we focus on the aspect of microbial dehalogenases that involved in the biodegradation of many important halogenated pollutants. The fate of halogenated compounds in the environment led to the conclusion that the main method of degradation of these compounds is via microbial metabolism, mediated by enzymes which remove the halogen substituents. A collection of enzyme catalysts was reported in many literatures to remove halogens from organic scaffolds. One of them is L-2-haloacid dehalogenases (EC 3.8.1.2) are of high interest due to their potential applications in bioremediation and in synthesis of various industrial products.

Keywords: dehalogenase, halogenated compound, haloacid, Rhizobium sp. RC1, genomic.

Crop Protection by Advanced Biotechnology

Sebastien Cunnac
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Abstract

This talk will first briefly introduce plant genome editing, the principles and the main technical options for the use of the CRISPR/Cas system and some examples of application of genome editing for crop improvement. We will subsequently focus on rice (Oryza sativa) host resistance engineering to control Bacterial Leaf Blight (BLB). Xanthomonas oryzae pv. oryzae (Xoo) strains that cause BLB in most rice growing regions, limit global rice production and require breeding more resistant varieties. Bacterial Type III secretion substrates of the Transcription Activator-Like Effector (TALE) family reach the host cell nucleus where they activate gene transcription to promote leaf colonization by binding to specific DNA sequences termed Effector Binding Elements (EBE). Xoo major TALEs universally target susceptibility genes of the SWEET transporter family. The natural polymorphism in EBE sequences upstream of OsSWEET genes creates TALE-unresponsive alleles and resistance to BLB. Similar mutations have been artificially introduced in the OsSWEET14 susceptibility gene promoter with genome editing. We will present the published work of several labs that have recently achieved broad BLB resistance in commercial rice varieties using multiplex genome editing. Finally, as a practical example of how this strategy can be implemented at the national level, we will report on our experience editing a domestic elite variety for BLB resistance in Vietnam. We will notably show how analysis of Oxford Nanopore Technology long read sequencing data from bacterial genomes can efficiently inform editing targets selection for the design of broad BLB resistance adapted to endogenous pathogen populations.

SPEAKER ABSTRACT

List Of Speaker Abstract

Improved management services cafe and fishing pond“Omahkui” based on protocol covid 19

Evita Soliha Hani[1]*, Irma Prasetyowati[2], Illia Seldon[1] , Fariz KustiawanAlfarisy[3]
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Abstract

Development of globalization and basic lifestyle needs of people in Indonesia are extremely diverse. One of the human needs is food and drink. Human needs in the form of food and drinks can be obtained by cooking or buying them in restaurants or cafes. In Indonesia, there are already many restaurants or cafes scattered in various places ranging from big cities to small towns. OMAHKUI is one of the businesses that consists of a Café and a Fishing Pond. The business is located in Kresek Hamlet, Ajung Village, Ajung District, Jember Regency. The obstacle faced is that since entering the pandemic period, the level of income and the number of visitors has decreased by 90%. The purpose of this study is to adapt how to improve café and fishing pond services in the context of existence in restoring income. Along with the outbreak of the Covid-19 virus and preventing its transmission, the implementing team proposed to create a service model based on the Covid-19 protocol. So that business activities continue to run by complying with health protocols. The methods offered to solve Partner problems are follow-up observation, lecture method, discussion, participatory, practice, and mentoring.

Key words: *café, fishing, omahkui, profit, service.*

Soil Structures Engineered With The Addition of Soil Stabilizing Agents And Exopolysaccharide-Producing

Dr. Ir. Arthur F. C. Regar, M.Sc.Ag
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Abstract.

Although almost in all aspects of the properties of the soils derived from volcanic ash on the southern slopes of Mount Merapi are not good (fertile), appropriate and good soil management will reduce nutrient loss in soils that have excess nutrients / nutrients from the root zone and increase the efficiency of fertilizer use and agricultural production. By using corn as an indicator plant has been conducted pot experiments to find out the effect of giving some soil-fixing materials namely Polyvinyl Alcohol, Latex, Amylum and inoculation of exolysaccharide-producing bacteria to soil structures originating from the southern slopes of Mount Merapi. The growth and biomass yields of corn crops show that there is a noticeable difference in crop height in H10, H20, H30 and the final vegetative phase between the altitude (soil retrieval site) where for P (Pakem Binangun) the lowest corn crop height, is in stark contrast to the location of H (Harjo Binangun) and S (Sardonoharjo). The same is true of the wet weight of trubus (stems and leaves), stems and leaves individually. The wet weight of the trubus, stems and leaves of corn plants is heavier in the order S > H > P. Dominance of the mixture of Azotobacter sp. +Rhizobium sp. and Rhizobium sp. the treatment of Azotobacter sp. Seen at the beginning of corn growth. But over time, on the 30th day (H30) and the final vegetative phase of plant growth is not too much different. The administration of bacterial inokulums in soils that are not treated with soil-fixing materials gives higher yields than those treated with soils (PVA, Latex and Amylum). Total population of bacteria, Azotobacter sp. sp, Rhizobium sp. and the mixing of Azotobacter sp. +Rhizobium sp. It showed a noticeable decrease until the 30th day (H30) after inoculation, but was still higher than the total population of bacteria that had previously been in the soil. This gives an indication that the soil environment is less suitable for its life, especially for Rhizobium sp..This is in accordance with the many studies that mention that Rhizobium sp. It requires legume plants to be able to be symbiotic. The role of each material used to improve soil aggregation stability and selected bacterial inoculation is also specific. The formation of a layer or volume of soil that is hydrophobic is very real for the addition of latex, but the lack of support for the formation of aggregates ideal for air movement and improvement of water storage capacity makes this soil less supportive of the growth and development of corn crops. The material contained amylum / starch and the media carrying inoculated bacteria is a material that is very preferred by microbes and soil animals. Its presence anywhere, whether in micro or macro pores, is food for them so that with a great possibility that the number will decrease rapidly or because it does not have enough time to form a solid aggregate, then the growth and development of the plant will be reduced quickly or because it

does not have enough time to form a solid aggregate, then the growth and development of the plant is difficult.

Keyword : Azotobacter sp, Rhizobium sp, Amylum, hydrophobic

Inventory of Fruit Fly Species on *Citrus reticulata* Blanco in Sion Farmers Group, Mollo Tengah District, South Central Timor Regency.

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Abstract

The fruit fly is one of the important pests on various species of horticultural crops, including chili, mango, melon, and jackfruit. Oranges are also one of the hosts of fruit fly plants, therefore this study aims to determine the species of fruit flies found in *Citrus reticulata* in the Sion Farmers Group, Mollo Tengah District, South Central Timor Regency, East Nusa Tenggara. Trapping fruit flies using methyl eugenol and essential oil from *Ocimum basilicum*. The identification results showed that there were only one species of fruit fly found on *C. reticulata* plants in the Sion Farmer Group, namely *Bactrocera dorsalis*. The fruit fly population was trapped in synthetic methyl eugenol compared to methyl eugenol from *O. basilicum* essential oil.

Keywords: *Oranges, fruit fly, Bactrocera dorsalis, metil eugenol*

Response of Endophytic Fungi to Synthetic Fungicides In Vitro

Agnes V. Simamora*, Mayavira V. Hahuly, Lusius F. Janggu
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Abstract

Plant disease control is often done using fungicides. However, the use of fungicides unwisely can cause problems for the environment, human health and can kill natural enemies including endophytic fungi. The use of fungicides with various active ingredients can control pathogenic fungi, but the application of fungicides is feared to cause a decrease in the diversity of endophytic fungi that can provide resistance to pathogens for the host. Endophytic fungi are fungi that live in plant tissues but do not cause disease. This study aims to determine the response of endophytic fungi derived from cocoa pods which have been proven to be effective in controlling Phytophthora palmivora in vitro against fungicide in vitro. This study used five types of endophytic fungi which were tested for resistance to five types of fungicides. The fungicides used were Mankozeb, Propineb, Pyraclostrobin, Dimetomorph, and Metalaksil. The experimental treatments were designed in a completely randomized design consisting of five replications. The variables in this study were the endophytic fungal colony diameter and the relative level of fungicide inhibition. The results showed that the five types of endophytic fungi tested were resistant to the five types of fungicides used.

keywords: *cocoa, endophytic fungi, synthetic fungicides, metalaxyl.*

Intensity of Phytophthora Fruit Rot Disease in Cocoa Production Centers, Sikka Regency, East Nusa Tenggara

Mayavira V Hahuly*, Agnes V. Simamora, Julinda BD Henuk and Micar Sibha
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Abstract

Sikka is the main cocoa producing district in NTT province. Cocoa production is constrained by various pests and diseases. One of the main diseases is phytophthora pod rot. This study aimed to reveal the intensity of cocoa pod rot due to *Phytophthora palmivora* infection in Sikka Regency. The survey was conducted in cocoa production centers, namely the Districts of Nelle, Hewokloang, and Talibura. The cocoa cultivated area tobe observed were determined by the Stratified Purposive Sampling method. In Hewokloang sub-district three villages were determined, and in each of Nelle and Talibura sub-districts, two villages were determined for examination. The results showed that in all the observed villages, the damage intensity of cocoa pod rot due to Phytophthora fruit rot disease ranged from 23% to 53%, and was classified in the category of severe damage.

Keywords: *cocoa, Phytophthora palmivora, pod rot, Sikka,*

An Analysis on the Relationship and Genetic Diversity of Indonesian Cassava Accessions [*Manihot esculenta*]

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Abstract

The genetic improvement of Indonesian cassava is limited by the lack of knowledge about genetic diversity in circulating cassava clones. Good breeding results require information on the Relationship between the clones used. This study aims to study the genetic relationship between several Jember cassava clones through genotype and phenotype approaches. The genetic relationship between 22 cassava accessions was analyzed using randomly amplified polymorphic DNA and phenotypically using the key of determination. The genetic Relationship dendrogram results were obtained from 87 DNA bands and 18 phenotypic characters. The genetic relationships were analyzed using similarity coefficients and phenotypic genetic distances. Relationship analysis of 22 cassava accessions based on phenotypic characters yielded similarity coefficients ranging from 0.39 to 0.83. Relationship analysis of 22 cassava accessions based on RAPD markers, resulted in a similarity coefficient of 0.5-1.0, or 55 to 100%.

Key words: *Cassava, dendrogram, genetic diversity, RAPD*

Capacity Of Rice Farmers In Using Media And Accessing Agricultural Information In Jember District

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Abstract

The development of agriculture is influenced by the development of technological advances and information for farmers. The development of technology and information is currently very fast. Society seems to be required to follow all forms of technological developments that are increasingly modern and advanced. To access information that is currently easily obtained, updated, and disseminated. The ease of farmers in accessing information makes it easy to obtain information about agricultural activities, thus providing new knowledge for farmers which is very useful. The purposes of the research are identifying the need of information among farmers and the used of media among farmers. The research area was determined purposively in Jember district. Determination of the research sample was carried out by simple random sampling on rice farmers. The number of respondents is determined by using the Slovin formula. The number of research respondents was 114 farmers out of 423 farmers. All the farmers are member of group farmers. The data were analysed descriptively.
The results showed that most of the respondent belong to aged 41-56, and achieved elementary school, they have moderate household size (5-7) person in one house and most of them have moderate experience on rice farming. Farmers used interpersonal, group and mass media. The media most often used by respondents is interpersonal media, they seek information about rice farming activities by directly asking fellow farmers, both farmers from one group or farmers from another group. They Interactions with other farmers within group other group. The farmers interacted with traders, seed distributors, pesticide distributors, as well as the extension workers. While the information needed by rice farmers is information about capital, availability of input, innovation and technology, pest disease, farm management, government policy and market.

Key words : *rice farmers, information, media*

Outlying Observation in Genotype's Stability Analysis: AMMI vs Huehn Method

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Abstract

Producing a quality crop that having superior characteristics is one of the important things in agronomy. It is expected that the superiority can be stable in various environmental conditions. There are parametric and nonparametric approaches to assess stability. One of the most favorite and powerful is the AMMI model which generates Biplots to visualize stability and adaptability. However, this approach requires assumptions, namely normality, and homogeneity of variance. On the other hand, Huehn's method as a non-parametric approach based on genotype ranking does not depend on those assumptions. Evaluating the performance of the two approaches is very important to characterize their statistical properties. By a particular scheme of simulation, it can be evaluated the resistance of AMMI approaches to the presence of outlying observation. This study added 2%, 5%, and 10% outliers for genotypes across environments to Rice and Soybean data set. Outliers were given by adding 3 times the standard deviation to the largest value in the randomly selected row/column. It was found that the AMMI was sensitive to the presence of outliers than the Huehn method, even in the low number of outliers. The Huehn method tends to infer genotypes as stable by the conservative chi-square test, but it can be solved by seeing the stability of each genotype relative to the others, using the rank of standardize Huehn's indexes, $Z^{(1)}$ and $Z^{(2)}$.

Keywords: *AMMI, Huehn methods, stability, outlier*

Study of Potential Metabolic Compounds from Carica Papaya Leaves as a New Ergogenic Model for Muscle Fatigue Inhibitors

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Abstract

BACKGROUND: Physically strong and healthy and not easily tired from every activity is the dream of every human being. To obtain a physical like this many ways and funds are spent. Exercise, nutritious food, psychological therapy, sports equipment, even using drugs to increase stamina so you don't get tired easily. Recently, the trend is to make ergogenic aids from natural ingredients. Besides nature, it is healthier and free from doping category drugs.
OBJECTIVE: To examine the bioactive compounds from Carica papaya leaves in the coastal area, Kajhu Village, Baitussalam District, Aceh Besar District, Aceh Province as a new ergogenic candidate sourced from natural herbal ingredients in inhibiting muscle fatigue.
Method: Phytochemical Screening with qualitative analysis
Results: Phytochemical screening to see bioactive compounds from Carica papaya leaf herbal plants carried out in the laboratory showed positive compounds such as flavonoids, steroids, saponins, alkaloids, tannins, and phenolics. The anti-inflammatory effect of Carica papaya leaves from flavonoids is known to prevent muscle damage due to high physical activity. Fatigue due to muscle damage due to inflammation can be avoided with flavonoid bioactive compounds from Carica papaya leaves.
CONCLUSION: Herbal plants are now in great demand and developed in the health sector, especially in improving and maintaining health. Many formulas are made of them in the form of ergogenic. Ergogenic from the Carica papaya herbal plant, which contains flavonoids and others, is believed to increase physical stamina, prevent inflammation and inhibit fatigue. COX, prostaglandins, thromboxanes, lipoxygenases that arise due to excess activity can be inhibited by their secretion of the bioactive compounds of flavonoid Carica papaya leaves.

Keywords: *Ergogenic, Fatigue, Carica papaya, inflammation*

Morphological and Molecular Identification of Some Aromatic Rice (*Oryza sativa* L.) Using RAPD (Random Amplified Polymorphic DNA)

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Abstract

Aromatic rice (*Oryza sativa* L.) is the main food crop consumed in Indonesia which has a higher fragrant. Annually, the demand for aromatic rice in the international market has increased over the past 15 years. Variety development is needed for the improvement of quality and quantity. Plant breeding assembly is often inappropriate because these varieties have close genetic diversity. Therefore, it necessary to analyze the diversity of aromatic rice using phylogenetic analysis. The phylogenetic analysis includes morphological, physiological and molecular identifications. Morphological identification based on differences in morphological characteristics of each plant. Molecular identification used RAPD which carried out based on DNA sequences that are homologous with the primary sequence of oligonucleotides. This research aims to identify the genetic diversity of 10 varieties of aromatic rice use the RAPD marker. The results showed that total bands from OPB-01 have appeared 6 bands, OPB-04 has appeared 6 bands, OPB-06 has appeared 8 bands, OPB07 has appeared 6 bands, and OPB-17 has appeared 4 bands from each variety of aromatic rice. The average polymorphism percentage was 71,8 %. Analysis of genetic similarity determined through Jaccard's arithmetic in UPGMA showed 2 clusters in a dendrogram.

Key words: *Aromatic Rice, Genetic Diversity, Morphological Characteristics, and RAPD*

Sustainability of Organic Rice Certification in the Rukun Makaryo Farmer Group, Pereng Village, Mojogedang District, Karanganyar Regency

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Abstract

The Rukun Makaryo Farmer Group is the only farming group in Karanganyar Regency that has been a reference in the training of organic farming systems at the National level in 2007-2011. In 2007, the Rukun Makaryo farming group won the National Level I Champion in irrigation water management to overcome the limited availability of water by utilizing cattle waste as a medium to bind water. Since 2000 farming groups have initiated the use of organic fertilizers from cattle waste to improve soil fertility. The Rukun Makaryo farming group has succeeded in initiating the utilization of cattle waste as a solid organic fertilizer and fermented liquid. The farmer group gets the opportunity to be assessed by the organic rice certification team from the Persada organic rice certification body on a member-owned land area of 5.9 hectares. This research aims to analyze the sustainability of organic rice certification programs in the Rukun Makaryo farmer group in Pereng Village of Mojogedang District of Karanganyar Regency. Research is conducted by qualitative description methods with phenomenological approaches. The results showed that the sustainability of organik rice certification experienced several obstacles, among others derived from farmer factors, the level of complexity and the low level of assistance to farmer groups.

Key words: *certification, organic, rice*

Consumer Perception Towards Hydroponic Vegetables

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Abstract

The market for hydroponic vegetables in Indonesia is at the beginning of its development, so the knowledge about hydroponic consumers is still lacking. The objective of this study is to find out the perception of household consumers towards hydroponic vegetables. The study was conducted in Kendari, Southeast Sulawesi. Ninety-two respondents were selected using accidental sampling from household consumers who purchased vegetables at four small-scale hydroponic farms. Data were analyzed using descriptive statistics. Study results showed that consumers perception toward hydroponic vegetables were “high” or “favorable” from health and environmental aspects, and “fair” from knowledge and product characteristic aspects. Overall, consumers have positive perception towards hydroponic vegetables, but there are challenges in terms of price, availability, and selling location. Further researches are needed to assess whether such favorable perception towards hydroponic vegetables has connections with the Covid-19 pandemic, which makes consumers are more concerned with health and environmental aspects of their diet.

Keywords: *consumer, household, hydroponic, perception, vegetables*

In vitro bioassay of bacteriophage XooG01 and *Elephantopus scaber* extract against *Xanthomonas oryzae* pv. *oryzae*

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Abstract

Bacterial leaf blight, caused by *Xanthomonas oryzae* pv. *oryzae* is one of the important diseases in rice that can reduce rice production bacteria. To overcome the losses, it is necessary to control it by controlling a safe and environmentally friendly control environment such as the use of biological control agents like bacteriophage or botanical pesticides like *Elephantopus scaber*. However, the study on their synergistic potency has not been tested against *X. oryzae* pv. *oryzae*. This study aimed to know the biological control potency of bacteriophage and *E. scaber* against the pathogen of bacterial leaf blight. This research was conducted on a laboratory scale through isolation of the pathogen, isolation of the bacteriophage, and bioassay test against *X. oryzae*. The result showed that the bacteria isolated from symptomatic leaf was identified as *X. oryzae*, isolate XooG01, XooH01, and XooH03C. In addition, *Xanthomonas* phage XooG01 was successfully isolated from the paddy soil with 2 mm of clear single plaque. The bacteriophage virulence assay showed that the bacteriophage XooG01 has a minimum of an effective multiplicity of infection (moi) of 0,1 that drastically reduce the growth of *X. oryzae* pv. *oryzae* isolate XooG01. In addition, the combination of moi of phage XooG01 and the concentration of *E. scaber* extract significantly reduced the growth of *X. oryzae* pv. *oryzae* XooG01. The result showed that the best combination of phage XooG01 and E. scaber extract were with the moi of 1 and concentration of 10 mg/ml, respectively. Since this result was based on the laboratory test, therefore, the in vivo test should be done for the comprehensive result of biological control potency of phage and E. scaber extract.

Keywords: *Bacteriophage, biocontrol, Xanthomonas oryzae pv. oryzae, Bacterial leaf blight, Elephantopus scaber*

Isolation protocol of Φ Ralsto Phage

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Abstract

The plant pathogenic bacteria, *Ralstonia solanacearum* is a complex and destructive pathogen. It can infected more than 200 host plant. Most susceptible hosts include cultivated plants within the Solanaceae family. The bactericide resistance case of *R. solanacearum* has reported during century. Utilizing the Φ Ralsto phage is one of alternative way to reducing resistance bacterial growth. However, the development of Φ Ralsto phage facing several problem. It like in the isolation and mass production. Research aimed to understand the suitable isolation protocol of Φ Ralsto phage, especially from cigar tobacco soil. It done with the baiting and normal protocol test, the serial dilution of the phage titer and difference filter type test. The selection of suitable protocol and instrument are having significant effect to the isolation result. Filter type is the most significant instrument on the phage isolation. Pre sterile Nylon filter is the most non suitable filter on Phage, it caused contamination level became higher depend other filter. The plaque and size were collected was different. Four main plaque morphologies are collected with the Sterile Nylon filter protocol. There was turbid edge, centre clearance and with halo. The main size of Φ Ralsto phage was on 9,2 – 12,4 mm.

Key words: *Filter, Morphology, Halo, Plaque, Turbid*

Antioxidant Activity of Five Plants Species as Imunomodulator

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Abstract

Covid-19 pandemic has entered its second year since being declared a global pandemic in early 2020. The number of positive cases reached more than 250 million people with 4.8 million deaths. Improving immunity is one of the efforts to prevent severe symptoms in patients with COVID-19. Several plants are known to have high antioxidant activity as immunomodulators such as pegagan (*Cantela asiatica*), sambiloto (*Andrographis paniculata*), ciplukan (*Physalis angulata*), meniran (*Phylatus niruri*) and Moringa (*Moringa oleifera*). The purpose of this study was to determine the antioxidant activity of five plants using DPPH method. This research was carried out in September-November 2020 at the Sumatran Biota Laboratory, Faculty of Mathematics and Natural Sciences, Andalas University. The DPPH method was used to determine the antioxidant activity. The results showed, meniran has highest antioxidant activity about (0.016%), Moringa (0.17%), ciplukan (0.33%), pegagan (0.87%), and sambiloto (1.21%).

Key words: *Antioxidant, Covid-19, DPPH, IC50, Pandemic*

The effectiveness of giving organic matter to the productivity of tomato plants

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Abstract

The assessment of the productivity of a land is not only based on natural fertility, but also the response of the soil and plants to the application of applied land management technology. Basic fertilizer is given at the time of planting by sprinkling it around the plant. The organic fertilizer used in this study is organic fertilizer from cow dung that has been completely decomposed. The dose of organic fertilizer and NPK according to the treatment is A = Control, B = NPK 180 Kg/ha, C = 100% NPK, D = Organic Manure 4 tons/ha + NPK 100%, E = Organic Manure 4 tons /ha + NPK 75%, F = Organic Manure 6 tons/ha + NPK 100%, G = Organic Manure 6 tons/ha + NPK 75%, H = Organic Manure 8 tons/ha + NPK 100%, I = Organic Manure 8 tons/ha + 75% NPK. With treatment (i) with the type of organic fertilizer and the dose of NPK gave the highest value in the vegetative and generative phases, for the generative phase (growth) plant height (93 cm), number of leaves (73 strands), stem diameter (0.88 cm), flowering age (26 DAP), number of flowers per plant (66). While in the generative phase (production) the number of fruits per plant (55 pieces), fruit diameter (4.4 cm), fruit weight per fruit (82.4 grams) and fruit weight per treatment was 631.3 kg and fruit weight per hectare reached 28471 Kg. Organic Manure 8 tons/ha (288.3 grams/plant) + 75% NPK (40.1 grams/plant) (I) of 58.1 tons/ha, is a very appropriate dose for nutrient absorption to produce fruit high production. The use of a combination of organic and inorganic fertilizers can increase the amount of organic matter in the soil and can provide the best nutrients for tomato plant growth so that it affects production.

Key words: *tomato, land, productivity, organic fertilizer*

Development Of Education Tourism Based Agricultural Through AHP (Analytical Hierarchy Process) Approach

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Abstract

The development of education tourism based agricultural in Lumajang Regency, East Java is expected to be able to create jobs, because this business can absorb labor from rural communities, preserve natural resources, preserve local technology, and increase the income of people around tourist sites. The purpose of this study was to analyze the priority of developing educational tourism based agricultural in Lumajang Regency, East Java. The results showed that the AHP model applied in decision making for the development of agricultural-based educational tourism in Lumajang Regency, East Java had three levels. Level one is the goal to determine priorities for the development of educational tourism based agricultural. Level two is a criterion consisting of aspects that support development such as: the level of ease of reaching tourist sites, the level of completeness of service facilities, the level of tourism management, the level of diversity of tourism activities. The third level is a sub-criteria which is an attribute of aspects that support development. The level of ease of reaching tourist sites consists of sub-criteria for distance from the city center, availability of public transportation, public road conditions/protocols, and tourist road conditions. The level of completeness of service facilities consists of sub-criteria for resting places, places to eat, places of worship, parking lots, toilets, availability of clean water, and local product outlets. The level of tourism management consists of sub-criteria for management status, number of tour guides, number of employees, quality of service and promotion. Meanwhile, the level of diversity of tourism activities consists of sub-criteria for the number of tourism activities, the area of tourism objects, the uniqueness of agro-tourism, the uniqueness of the natural environment and the uniqueness of the local socio-culture.

Key words: *education tourism, AHP, priority development*

Financial Feasibility Analysis Agroindustry Of Creative Economy Product For Coastal Community

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Abstract

In general, coastal communities have a livelihood as fishermen with various levels of technology used. The productive economic aspects of coastal communities are not simple, because economic interactions are influenced by social ties and vice versa. Efforts that can be made are through the development of the creative economy, which is an economic concept in the new economic era that intensifies information and creativity by relying on ideas and stock of knowledge from Human Resources (HR) as the main production factor in its economic activities. The creative economy will play a very important role in developing job creation, given the huge potential of the creative economy with various community characteristics. The purpose of this study was to determine: (1) the potential of fishery resources and the variety of creative economic products of communities in coastal areas; and (2) the economic feasibility of creative economy products for coastal communities. This research was conducted in East Java (Banyuwangi, Situbondo, Malang and Trenggalek districts). The financial feasibility with the traits of investment criteria: Net Present Value (NPV), Net Benefit Cost Ratio (Net B/C), Internal Rate of Return (IRR) and Payback Period (PP).The results showed that, (1) The potential of fishery resources and the variety of creative economy products in the coastal areas of the East Java Province consisted of various types of fish and various processed products. (2) Financial feasibility of creative economy products for coastal communities, namely all agro-industries located in 4 districts consisting of 28 agro-industries, which are feasible to be cultivated, because they have NPV values > 0, Net B/C > 1, IRR > 1 and PP >1.

Key words: *creative economy*, *fishery resource*, *financial feasibility*, *coastal community*

Essential Oil Agroindustry: Potential And Development

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Abstract

Essential Oils are fragrant oil extracts obtained from the distillation of plants, flowers, roots, wood, or fruit seeds. The demand for essential oils continues to increase along with the growth of the pharmaceutical industry, flavoring agents and others. In Indonesia, there are 40 species of plants that can produce essential oils, but about 12 have been developed and 9 types of oil are still exported. One of the most well-known essential oils is patchouli oil. In the world essential oil market, the quality of Indonesian patchouli oil is best known and controls 80-90% market share of the world's essential oil needs. The purpose of this study was to determine: (1) the characteristics of essential oil agroindustry, from the aspect of business growth process, availability of raw materials, business capital, production process, use of labor, product marketing; (2) added value and value added advantage in essential oil agro-industry; (3) business feasibility of essential oil agroindustry; and (4) the prospect of developing essential oil agroindustry. This research was conducted in East Java (Ponorogo, Tulungagung and Pacitan districts). The results showed that, (1) Essential oil agroindustry in East Java consisted of various types including clove oil, lemongrass leaf oil, patchouli oil, orange peel oil, orange leaf oil and orange stem oil, (2) The essential oil agro-industry provides added value and positive benefits, and is able to contribute to agro-industry management as well as to workers' wages, this is shown by a positive value, (3) The essential oil agroindustry is economically feasible to operate because it provides benefits, based on indicators of NPV, Net B/C, Gross B/C, IRR and PR, (4) The strategy for developing essential oil agroindustry in East Java is to engineer institutional strengthening in the form of cooperatives which become a forum for all essential oil agribusiness actors.

Key words: *Agroindustry, essensial oil, value added dan business development*

Soybean Agroindustry Development Pattern In The Scarcity Of Imported Soybeans

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Abstract

The development of the soybean-based food industry has job opportunities starting from cultivation, harvesting, processing, transportation, markets to agro-processing industries. In fact, soybean agro-industry activities experience a fairly strong dependence on imported raw materials, resulting in reduced supply and price spikes will be a problem for business actors. The purpose of this study was to determine: (1) analyze the availability of product raw materials in soybean agroindustry; and (2) soybean agroindustry development pattern in the scarcity of imported soybeans. This research was conducted in East Java (Bayuwangi, Malang and Kediri). Data analysis methods was used Economic Oreder Quantity (EOQ), ROP and FFA (Force Field Analysis). The results showed that on the value of the Economic Order Quantity (EOQ) in the Kediri tofu agroindustry is 73.74 kg, Kediri tempe is 91.29 kg, Malang tofu is 152.55 kg, Malang tempe chips is 27.58 kg, Malang tempe is 114.59 kg , Banyuwangi tofu is 230.02 kg and Banyuwangi tempe is 90.45 kg with each combination of needs from the amount of raw materials for each production, the price of raw materials per kilogram and different values.. The pattern of soybeans agroindustry development in overcoming the scarcity of imported soybeans based on farmer groups is formulated to involve many activities with many actors including pre-production, production, post production, various processed products, farmers, agribusiness forum, support services and government roles.

Key words: *Agroindustry, essensial oil, value added dan business development*

Farmer Response to The Implementation of Farmer Card

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Abstract

The Farmer Card policy is intended to support agricultural development, particularly in increasing rice production and productivity. According to the Ministry of Agriculture, the purpose of the Farmer Card is to protect fertilizer subsidies. If the need for fertilizer is fulfilled, it will impact rice farming production and efficiency, and food needs will be fulfilled. This study aims to determine farmers' response to a farmer card program in rice farming in the Jember Regency. The sample used was 20 farmers in each of Ambulu District, Wuluhan District, and Balung District. Data analysis used a proportion test on several indicators to be asked, namely the cognitive, affective, and conative indicators of farmers. The results showed that less than 60 percent of rice farmers in Jember Regency had a high response to the existence of a farmer card. This shows that farmers do not know about the purpose of giving farmer cards, the benefits of farmer cards, and the use of farmer cards. Most of the rice farmers in Jember Regency have an inadequate response to the existence of this farmer card, which is around 56.67 percent. As much as 70.12 percent of the diversity of farmer response variables is influenced by the variety of age, land area, education level, membership status of farmer groups, and the role of extension workers, other variables outside the model influence the remaining 29.88 percent. Based on the estimation results, it was found that age had a positive but not significant effect. This shows that the farmer's age does not affect the farmer's response to the existence of a farmer card. In addition, the area of land and the dummy role of the extension agent also did not affect farmers' response to the existence of a farmer card.

Keywords: *farmers' response, farmer card, tobit*

Consumer Attitudes Towards Food Attributes Due to the Dynamics of Supply Shock Covid 19

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Abstract

Regional lockdown policies and work-from-home patterns have led to changes in consumption behavior and household food purchases. This study aims to determine consumer attitudes towards food attributes due to the dynamics of supply shock due to Covid 19. This study was conducted in Jember Regency using a sample of 100 respondents spread across urban and rural areas. This study uses fishbein analysis to determine consumer attitudes towards food attributes due to the Covid 19 pandemic. The results of the analysis show that consumption patterns change during the pandemic. These changes include the number of purchases, changes in the place of purchase, and the frequency of purchases. The price attribute has a high level of importance, but has low performance. The food price attribute needs attention from the government so that people can access food. The attribute of ease of access has a high level of importance and also has high trust from consumers. The stock attribute has a high level of importance but has sufficient trust from the public. In addition, quality or brand attributes have a low level of importance, but have a relatively high level of trust from the public.

Keywords: *consumer, foot attributes, covid-19*

Agronomic characteristics and potential of local variety of citronella oil in Cianjur Regency, West Java

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Abstract

West Java is one of the largest citronella oil producers in Indonesia. Currently, several communities in West Java are still developing citronella grass with local varieties that have been passed down from generation to generation and have not been identified. This study aims to identify the potential of citronella grass in the Cikadu region as a local superior variety. The research was conducted in Cikadu District, Cianjur Regency, West Java Province in May-June 2021. The research methods involved survey techniques as well as laboratory tests. The survey was conducted to identify the morphology of citronella, the characteristics of habitat and its use by the local community, while laboratory tests were conducted to determine the yield and quality of citronella oil. The results showed five accessions of citronella have morphology differences in leaf width and leaf blade stiffness, especially in young leaves whose shoots grew from the middle of the clump weevil. The five accessions include Puncak Sirna (PS) 1, PS2, PS3, PS4 and PS 5. Citronella grass habitat soil conditions are classified as infertile. This is indicated by several parameters of the soil, , including soil pH levels classified as acidic to slightly acidic, C-organic content is classified as very low to very high, cation exchange capacity (CEC) levels are classified as very low to very high and Base Saturation (KB) is classified as very low to high. The analysis of citronella oil content shows that the quality of citronella was 39.05% – 49.01% with the highest citronella content in PS2 accession (49.01%). Meanwhile, the distillation results show a general yield value of 0.83% - 2.08% with the highest yield is obtained by PS4 accession (2.08%). Citronella oil refining is quite economical and is capable of empowering communities living around forest in research location. In general, the research indicates that citronella grass accessions in Cikadu have the potential to be cultivated and developed as superior local varieties of West Java.

Keywords: *cymbopogon, Indonesia, morphology, habitat, citronella, yield*

Increasing the women's role in industrial agriculture through the development of cocoa-based agroindustry in rural area

(A case study at the Jambewangi Village, Sempu District, Banyuwangi Regency, East Java, Indonesia)

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Abstract

Indonesia is the largest cocoa bean producer in Asia and number 3 in the world. Most of cocoa beans in Indonesia are produced by smallholder plantations like in Jambewangi Village, Banyuwangi Regency. Besides as the large cocoa producer, their cocoa has the good quality. In this village, the housewife has an important role in cocoa farming. The study's purposes were to identify 1) the traditional role of women in cocoa farming; 2) the role of women in developing cocoa-based agroindustry and educational tourism. This research used descriptive qualitative approach. The data collected using the participatory observation method and indepth interviews and analyzed using the Miles and Huberman Model. The study results showed; 1) traditionally, women involved in cocoa farming especiall in the off-farm. They were active in post-harvesting and marketing, even in marketing, the role of women was greater than the husbands. 2) In developing cocoa-based agroindustry, women supported by training could process cocoa fat and powder to be culinary products such as praline, snacks and bread with chocolate flavour. The growth of cocoa-based agroindustry has a multiplier effect for village development, creating job opportunities, and increasing the income of people.

Key words: role of woman, cocoa, agroindustry

Effectiveness of Rock Phosphate Direct application combined with Cu and Mg on nutrient availability and uptake, production of total phenolic and flavonoid on rice

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Abstract

Phosphorus is needed in sufficient quantities to support the metabolic functions of rice, including root development and tiller formation. In addition, elements of Magnesium (Mg) and copper (Cu) play an essential role in photosynthesis and enzyme activators. Agromineral rock phosphate is one of the sources of P nutrients that directly apply. The research aims to (1) evaluate the effectiveness of the direct application of rock phosphate combined with Cu and Mg nutrients on rice growth and nutrient uptake and (2) quantify the secondary phenolic and flavonoid metabolites produced by rice plants. The experiment was carried out in a greenhouse with seven P, Mg, and Cu nutrients combinations. The dose used is according to the recommendations for rice plants. The rock phosphate (RP) agromineral material collected from the Tuban deposit was compared with SP36 fertilizer. Direct application of rock phosphate combined with Cu and Mg nutrients improved soil phosphate and magnesium availability, and not significantly different from the combined application of SP36, Cu, and Mg, with concentrations ranging from 12.5 to 17.37 ppm P_2O_5 and 1.34 to 1.50 me Mg^{2+}.100g $soil^{-1}$. In addition, the application of RP combined with Cu and Mg was also not significantly different from applying a combination of SP-36 fertilizer with Cu and Mg on the availability of soil Cu with concentrations of 2.21 ppm to 6.62 ppm Cu. The total phenolic content in the leaves in the vegetative phase ranged from 5.83 – 7.8 mg GAE.g^{-1} extract, higher than the generative phase, which was 3.72 - 4.12 mg GAE.g^{-1} extract. Total flavonoids in the vegetative phase ranged from 1.56 to 3.5 mg QE.g^{-1} extract and from 1.03 to 2.15 mg QE.g^{-1} extract in the generative phase.

Keywords: *Phenolic, flavonoid, Agromineral, Rock phosphate*

The Effect of Kale (Brassica Oleracea A) Juice Product Quality on Consumer Satisfaction

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Abstract

This study aims to describe and determine the effect of kale juice product quality on the level of consumer satisfaction, this research was conducted at IRT Hydroponics Farm Lamongan in March – June 2021. The method used for this research was descriptive quantitative, the data were used primary and secondary data obtained from related parties. The population of this study was 110 people from customer data of juice consumers and 50 samples were taken for research conducted using a random sampling technique using the slovin formula (2016). The variables used in this study consisted of the independent variable, which were product quality (X), and the dependent variable, which was consumer satisfaction (Y). Data analysis was carried out using descriptive analysis and simple linear regression, the test instrument used was SPSS 20 by showing the results of descriptive analysis of quality. The product according to consumer perception was said to be good and customer satisfaction was in the satisfied category and simple regression analysis showed the results that it can be seen that the t value for the product quality variable on consumer satisfaction is 8.314, this means t count (8.314) > t table (2.011) and sig 0.000 <0.05 then H0 is rejected and H1 is accepted. Product quality has a significant effect on customer satisfaction with kale juice .

Keywords: Product Quality, Consumer Satisfaction, Kale

Concentration Index of Feed Production Based on Harvested Area of Rice Plants in the Farmers Groups, Siparappe Village, Sawitto District, Pinrang Regency as One of the Ruminant Livestock Feed Bases in Fulfilling Animal Foods

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Abstract

This study aims to determine the concentration index of feed production based on harvested area of rice plants in the farmer groups, Siparappe Village, Sawitto District, Pinrang Regency as one of the ruminant livestock feed bases in fulfilling animal foods. This research uses quantitative methods. The data used is primary data from farmer groups to obtain information on the harvested area of rice. The results showed that the index value of the concentration of feed production in all farmer groups was in the low category, which was below the value of 1. This shows that the availability of ruminant feed has not been fulfilled if it only relies on rice plant waste in Siparappe Village, Sawitto District, Pinrang Regency.

Utilization Of Hydrilla (*Hydrilla verticillate* L.) As Soil Improvement In Improving Soil Physical, Chemical And Biological Conditions

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Abstract

Hydrilla (*Hydrilla verticillate* L.) is one of the aquatic plants that has not been used optimally by farmers. This plant is often thrown away around the bunds because it is considered to interfere with the agricultural system. Based on the research results, *Hydrilla verticillata* L. contains protein, nitrogen, and carbohydrates and therefore has the potential as a fertilizer. In addition to helping to overcome the problem of the high price of inorganic fertilizers and the occurrence of soil damage due to excessive use of chemical fertilizers, hydrilla plants can also help solve the problem of natural resources that have not been used optimally. The research was carried out to test the benefits of hydrilla plants as a soil enhancer in improving the physical, chemical, and biological conditions of the soil. The research was carried out in *Purworejo* village, *Ngantang* sub-district, Malang district from October 2020 to January 2021. The study used a randomized block design with 6 treatments of fermented hydrilla doses, namely: P1 = 5 tons/ha; P2 = 10 tons/Ha; P3 = 15 tons/Ha; P4 = 20ton/Ha and P5 = NPK inorganic fertilizer dose of 250 kg/Ha. As an indicator, large chili (Capsicum annum L.) was planted and the generative variables were observed. The results showed that 15 tons/ha of hydrilla compost was the optimal dose to improve soil conditions as indicated by the optimal yield of large chilies.

Keywords: *fermented, soil enhancer, soil physical.*

Free Radical Study of Papua's Candy as The Consumption Culture of The Papuans.

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Abstract

Papua's candy is one of Indonesia's indigenous consumption consisting of areca nut (*Areca catechu*), forest betel fruit (*Piper aduncum*), and lime betel made of pulverization of *Anadara granosa*'s burnt shell. This research aims to determine the interactions between tannins, alkaloids, flavonoids, and $CaCO_3$ compounds, understand their effects on health, and find solutions in preserving the tradition if potential free radical compounds are found through formulating recommendations for consumption with forecasting approach. The research methods were pre-treatment, extraction, alkaloid test, tannin test, flavonoid test, and dpph assay which resulted in IC_{50} values. Data analysis used mathematical linear regression for each experiment. The concentrated extract obtained was 6.4 grams of areca nut in ethanol, 4.6 grams of areca nut in aquadest, and 4.8 grams of forest betel fruit. The test results on areca nut extract were positive for alkaloids with a Rf value of 0.773 and a tannin concentration of 0.603 mgGAE/g, while the concentration of flavonoids in forest betel fruit extract was 125.402 gQE/g. The final dpph assay resulted an IC_{50} value of 3.0403, showing high antioxidant activity in the mixture of papua's candy. Therefore, papua's candy doesn't cause radicality if consumed in the recommended doses, approximately maximum of 4 areca nuts, 5 forest betels, and 1 gram of lime betel. This recommendation was obtained from the calculation of weight of each components, resulting extract, and extract being used in dpph assay. Further innovation is needed by transforming it into formulated hard candy and commercializing it with packaging and attractive design.

Keywords: *antioxidant activity, compounds interaction, free radical, papua's candy.*

Novelty and Smart Education of Microalgae *Spirulina* and *Chlorella* sp. based Sausages

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Abstract

One of the most consumed processed meat in diet is sausage. Predicted to reach gigantic demand by 2050, the low resources of meat is one of the obstacle to actualize it. Moreover, although there are wide variety of sausages, we can't deny that boredom is one of consumers behavior. This could be a momentum for food developer to initiate a step in improving eating habits: rich in nutritional and/or functional terms. To provide consumers with novel plant-based sausage while also providing food diversification, microalgae *Spirulina* and *Chlorella* could be used. Both of them contain high protein, amino acids, and natural sources of vitamins, making them provide many benefits towards human's health. The number of Spirulina and Chlorella global production annually showing the big potential of them in the future. These microalgae powder can be combined with soy protein isolate, and other ingredients to make a vegan sausage. The process started with soy protein isolate and gluten soaked in cold water, the ingredients were mixed, batters were pulled into hydraulic piston-type stuffer, impermeable cellulose casings, and twisted-tied manually, stored, cooked, and cooled. However, this global trend is not familiar to Indonesians so education is needed to introduce other alternative functional foods. Thus, the purpose of this study is to examine vegan trends toward people needs for novelty in meat-based food while also introduce them with education. This method is useful to overcome issues about knowledge of microalgae as meat substitute and healthy lifestyles in food security programs that still relatively low.

Key words: *microalgae, sausages, substitute, education.*

Supply Chain And Quality Management Of Arabica Coffee: A Case Of Smallholders' Agribusiness In Bondowoso Regency

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Abstract

The plantation sub-sector is a sub-sector that has a very important role in the Indonesian economy. Bondowoso Regency is an area that has high production for plantation commodities especially coffee, where part of that is arabica coffee managed by Andung Tani Farmer Group I. Activities carried out by farmers as well as market intermediaries for Arabica coffee have created a supply chain and added value to the product due to continuous quality improvement of the Arabica coffee and its derived products. Arabica coffee supply processing, however, sometimes experiences excess and shortage of stock which has an impact on market needs and consumer satisfaction. The excess supply of arabica coffee led to the processing of Ose Coffee, HS, and Coffee Powder. The research aims to seek to identify the arabica coffee supply chain management, the added value of processing products from the arabica coffee agro-industry and the quality management of the coffee products in the supply chain. The research method is descriptive analysis to explain supply chain and integrated quality management and Hayami method analysis for the added value of Arabica coffee. The results of the analysis show that (1) the processing of supply chain conditions includes five aspects regarding the local-international market target, marketing institutions (collectors, wholesalers, exporters, resellers), contract and trust systems, as well as cash and transfer payment systems., (2) the added value of Ose arabica coffee, HS, and Coffee Powder produce positive and thus profitable added value, (3) integrated quality management consisting of 10 aspects in the management towards the quality of SNI 01-3542-2004 has been fairly implemented in the smallholders' arabica coffee supply chain in Bondowoso.

Keywords: *arabica coffee, supply chain, added value, and quality management*

Effect of different carbon sources for callus regeneration of Mentik Wangi, Mentik Wangi Susu and Tarabas rice

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Abstract

Tissue culture is one of the techniques involved in implementing genetic transformation in biotechnology. One of the determining factors that determine tissue culture is media culture, one of which is a carbon source. The use of different carbon sources has been known to have an effect on callus induction and regeneration in tissue culture of rice plants. Based on this, this research was conducted to find the best type of carbon source for callus ordering and levels in Mentik Wangi, Mentik Wangi Susu and Tarabas rice. This research was conducted using a completely randomized design (CRD) 2 factors. The first factor is the rice varieties Mentik Wangi, Mentik Wangi Susu and Tarabas. The second factor is the type of carbon, namely glucose, sucrose and maltose. The data obtained were analyzed by analysis of variance with Fisher's Test, then further tested with DMRT (Duncan's Multiple Range Test) at 5% level. The results showed that Tarabas rice had the best regeneration power compared to Mentik Wangi and Mentik Wangi Susu in all treatment combinations. Maltose maltose gave the best regeneration rate in all callus of used rice varieties.

Key words: *carbon, sucrose, callus, regeneration*

Agronomic characters and aromatic genotypes of selected F6 generation rice plant line number 29 from cross pollination of Merah Wangi and Pendok verieties

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Abstract

Aromatic rice is a type of local rice that is in great demand the public, because of its fluffier character and has pandan aroma derived from the volatile coumpound 2 acetyl-l-pirroline (2AP). In this study, the analysis of agronomic traits and the presence of aromatic genotypes of selected F6 generation rice plant line number 29 from cross pollination of Merah Wangi and Pendok verieties was carried out. Observation variables used plant height, number of tillers, flowering time, percentage of productived tillers, number of panicle grain, panicle grain weight, weight of 1000 grains, weight of 1000 seed, number of pithy seeds, and analysis of aromatic genes of. Agronomic data were analyzed by ANOVA and further analyzed by Duncan Multiple Range Test and the molecular data is shown by the visualization of genomic PCR product using Bradbury marker. The results showed that the selected plant line number 29 cross between the Merah Wangi and Pendok showed the distinctive phenotypes such as filled seed rate, tiller number, and flowering time. Moreover, the genotyping analysis using Bradbury marker showed that all of selected individual plant had homozygous aromatic genotypes.

Key words: *rice, agronomy characters, aromatic genotypes, F6 generation, Merah Wangi, Pendok*

Feasibility Analysis of Application of Mina Padi System Innovation Technology on Rainfed Land in Realizing Farmer Welfare in South Konawe Regency

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Abstract

Mina Padi on rainfed land is applied with different innovations in Mina Padi irrigation system. This is because the availability of water is highly dependent on rainwater. The purpose of this study was to determine the innovation of the application of the Mina Padi system on rainfed land in realizing the welfare of farmers and the feasibility of applying Mina Padi technology on rainfed land. The sample of this study was 68 people using the census method. The data analysis used is descriptive qualitative analysis and marginal benefit cost ratio (MBCR) analysis. The results of this study are innovations in developing the Mina Padi system on rainfed land, starting from land preparation for Mina Padi, semi-organic fish and rice cultivation, and mina Padi based on freshwater fishing.

Key words: *Feasibility, Innovation, Mina Padi, Rainfed, MBCR*

The Effect of Planting Media Composition And Coconut Water Concentration on Yield And Quality Of Red Chilli (Capsicum Annuum L.)

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Abstract

Red chili *(Capsicum annuum L.)* is one of the important horticultural commodities which is widely cultivated in Indonesia and has high economic value. The need for red chili in Indonesia continues to increase in line with the increasing need for public consumption and for raw materials for the food industry over the last five years. Therefore, it is necessary to have a strategy to increase the production of large red chilies to meet domestic needs, namely through the application of cultivation technology innovation. Innovation technology for red chili cultivation by utilizing cocoa husk waste as organic compost, bokashi fertilizer and coconut water as natural plant growth hormones. The cultivation technology package is expected to provide the right solution to increase the yield and quality of red chili. The aim of the study was to determine the yield response and quality of large red chilies which were carried out using a Completely Randomized Design to examine the treatment of two factors (4x4) which were repeated 3 times, namely the composition of the planting medium as the first factor and the concentration of coconut water as the second factor, carried out for 4 months starting from April until July 2020. The results of statistical analysis of all experimental parameter data show that the treatment of the interaction of two factors between the composition of the planting medium and the concentration of coconut water has a significant effect on all the parameters observed. The combination of treatment between the composition of the growing media mixture of soil (20%) + bokashi fertilizert (20%) + cocoa husk compost (60%) with coconut water concentration treatment of 30 ml/ liter of water showed the best effect on all parameters of yield and quality red chili.

Keywords: *Composition of planting media, cocoa husk compost, bokashi fertilizer, natural plant growth hormone*

Effect of Mutagen *Ethyl Methane Sulfonate* Treatment on the Physiochemical of Tomato

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Abstract

One of the efforts to improve the quality of tomatoes can be done through mutagenic agents. This study's aim was to determine the response of tomato plants to EMS treatment and K fertilization on the organic compound content of tomato fruit (Solanum lycopersicum Mill.) The treatment was the concentrations of EMS in 4 levels (0%, 0.1%, and 0.2%) and three levels of K fertilizers (0 g, 5 g, 10 g per plant). The experiments were conducted in two factorial randomized complete block design (RCBD) with three replications which consist of seven treatment levels and four replications. Observations of the tomato fruit components showed that the best results were shown in 0.1% EMS treatment and without K fertilization treatment. Total dissolved protein content (Standard BSA), hydrogen peroxidase, ABTS, proline, reducing sugars, vitamin C content, and carotenoid content showed the highest yield.

Keywords: *Mutations, tomatoes, EMS, potassium, physiochemical*

Characterization and evaluation of lipase inhibitory activity of Raja Sereh (*Musa sapientum*) banana kombucha enriched with lactic acid bacteria

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Abstract

In addition to its delicious taste, high nutrition and relatively affordable price, banana is a potential fruit commodity to support food security. Banana contains various bioactive compounds, such as saponins, glycosides, tannins, pectin, soluble fiber, alkaloids, antioxidants, phenolics and flavonoids. Instead of direct consumption, banana can also be converted into various products. One of them is fermented banana as a new and unique banana kombucha drink. This study aims to determine the lipase inhibitory activity produced by Raja Sereh banana kombucha (*Musa sapientum*) enriched with lactic acid bacteria (LAB) such as: *Lactobacillus plantarum, Lactobacillus plantarum* and *Bifidobacterium bifidum* at different fermentation times at 0-48 h. The results showed that the highest lipase inhibitory activity was in fermented banana kombucha with the addition of L. plantarum, which was fermented for 48 h by 84.76%, with antioxidant activity of 90.83%, total LAB of 10.58 cfu/mL, pH 4.28, and total polyphenols of 0.43 mg GAE/mL. From these results, it showed that the banana kombucha drink with the addition of LAB and the difference in fermentation time could affect the results of pancreatic lipase activity, antioxidants and other characteristics such as total polyphenols, total LAB, pH and total acid.

Key words: *Raja Sereh banana, Kombucha, Lactic acid bacteria (LAB), lipase*

Effect of Biochar Application on Maize Growth Rate in Dry Land with Two Irrigation Systems

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Abstract

Dry land in Indonesia covers an area of 144.47 million hectares and 76% of them are in the lowlands (< 700 masl). The dry land has the potential to be planted with vegetables, food crops, and annual crops as well as livestock grazing. Dry land is land that does not have groundwater available for mesophytic plants for a long time. Dry land development can be done through the implementation of soil biological engineering and water management to support agro-ecosystem sustainability. The research was conducted by engineering the soil, namely adding biochar and organic matter and providing water through two irrigation systems. Biochar and organic matter added to the soil aims to provide a place to live and a source of energy for microorganisms. Microorganisms have a key role in the decomposition and mineralization of minerals in the soil to be converted into nutrients that are readily absorbed by plants. Meanwhile, water plays a role in meeting the needs of microorganisms and plants. The experiment used corn plants of the BISI-18 variety planted in Kandang Village, Kapongan District, Situbondo Regency during the dry season of 2020. The biochar application treatment consisted of 1,000 kg of Biochar per hectare and (200 kg of biochar + 800 kg of compost) per hectare; while the irrigation system consists of surface irrigation and sprinkler irrigation. The results showed that the application of biochar mixed with compost had a significant effect on the growth rate of corn plants in dry land irrigated with sprinkler irrigation.

Key words: *biochar, compost, corn, irrigation.*

Hymenoptera parasitoid, natural enemy agent controlling Spodoptera frugiperda in Indonesia and its identification key

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Abstract

Spodoptera frugiperda is a maize pest that entered Indonesia in 2019. The entry of invasive pests into Indonesia is generally not accompanied by their natural enemies, so their presence can damage crops with heavy intensity. Local natural enemies such as parasitoids are expected to be able to control the population of the invasive pest *S. frugiperda*. The aims of this study is to provide information on local parasitoids capable of suppressing the population *S. frugiperda* in Indonesia and their identification key. Data were obtained through literature study and sampling of *S. frugiperda* eggs and larvae were taken from maize plantations in Sumedang Regency and its surroundings. The results of the study reported that three species of egg parasitoids, i.e *Telenomus* sp., *Trichogramma* sp., and *Mymaridae* sp., were found in West Java and East Java. As well as six species of larval parasitoids, consisting of *Apanteles* sp., *Eriborus* sp., *Charops* sp., *Euplectrus* sp., *Microplitis* sp., *Coccygidium* sp. The Identification keys based on morphological characters used to make it easier to distinguish between hymenoptera parasitoid genera. The discovery of local parasitoids that have a wide host range (generalist), such as *Telenomus* sp., *Trichogramma* sp., *Apanteles* sp., and *Eriborus* sp., indicates that these parasitoids can be obtained from other hosts besides *S. frugiperda* and can be propagated by alternative hosts to suppress population of *S. frugiperda* in the field.

Key words: *egg parasitoids, larval parasitoids, local parasitoids, invasive species.*

Profitability of Hydroponic Business in Kendari City During the Covid-19 Pandemic

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Abstract

During the COVID-19 pandemic, restrictions on inter-regional mobility imposed by the government caused the supply of vegetables from outside Kendari City to decline. Some people relied on fulfilling vegetable needs from hydroponic farming production in Kendari City. This study aims to analyze the profitability of hydroponic farming in Kendari City during the covid-19 pandemic, which was carried out from September to October 2020. The population and sample in this study were hydroponic farming in Kendari City. The analysis used in this study is the analysis of costs, production, hydroponic farming income and profitability analysis using NPM (Net Profit Margin). The study results found that during the covid-19 pandemic, the total sales revenue was Rp. 15,540,984/month with an income of Rp. 10,409,016/month, and the profitability of hydroponic farming is 67%. From these results, it is known that during the Covid-19 pandemic, hydroponic farming played a huge role in meeting the vegetable needs of urban communities to obtain positive profitability.

Key words: *Hydroponics; Income; Profitability; Covid-19; Kendari City*

Study of Antioxidants by-products of Gambir Leaves into Tea with the Addition of Red Ginger Powder (Zingiber officinale Var. Rubrum)

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Abstract

Indonesia is the largest gambier producing country in the world and West Sumatra is the largest gambier producing center in Indonesia which is the province's leading commodity. The production of gambir sap always produces a by-product in the form of leftover leaves which can be developed into food products in the form of tea bags. This study aims to determine the antioxidant activity of by-products of gambir leaves with the addition of red ginger powder. This research was conducted at the Agricultural Product Technology Laboratory, Ekasakti University, Padang from October to November 2020. The design used in this study was a simple completely randomized design (CRD) with 5 treatments and 3 replications. The results of the observations were analyzed by variable analysis (ANOVA) and Duncan's New Multiple Range Test (DNMRT) advanced test at the 5% level. The results showed that the addition of red ginger powder to the tea by-products of gambir leaves had a significant effect between treatments on the antioxidant content. All parameters have met the quality requirements of dry tea set by SNI and red ginger gambir leaf tea is the most preferred by panelists in treatment E with the addition of 40% red ginger powder

Keywords: *antioxidant, gambir leaf tea, red ginger.*

Population Density and the Pattern of Vegetable Cultivation in the Yogyakarta Agglomeration Area: Machine Learning Approach

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Abstract

The objective of this research is to implement machine learning in the social-economics field in agriculture. Principal Component Analysis (PCA) and unsupervised neural networks (SOM) are used in this research. Due to land conversion from agriculture to urban uses, land availability for agriculture decreases which may alter food sufficiency. Basically, urban land uses with higher land rent will supersede agricultural use with lower land rent. From the agricultural perspective, plants that are more extensive and need more land will be pushed away from the urban centre while the more intensive ones will be cultivated close to the urban area (market). Vegetables can be cultivated with or without soil, thus they have more flexibility in adapting to urban growth. The changing pattern of vegetable cultivation in areas with dense and sparse populations in the Yogyakarta agglomeration area can be evaluated by machine learning. Clustering analysis was conducted by PCA and SOM. The results indicate that locations close to the city are characterized by low value yet easy to be cultivated plants (e.g. water spinach), while more extensive cultivation is cultivated away from the city centre (e.g. chili). Knowing this pattern will help to determine the vegetable planted in the specific region.

Key words: *agglomeration, vegetables, Machine Learning, SOM, PCA*

Garlic Farming Efficiency in Central Java Province

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Abstract

The purpose of this study was to compare garlic farming in Karang Anyar and Magelang districts in the accuracy of implementing production factors with recommended technology, as well as to measure the efficiency of garlic farming in the two districts. Garlic is a horticultural commodity with the main function as a cooking spice in Indonesia; Thus the demand for garlic tends to increase according to the increase in the number of households and population in Indonesia. The requirements for garlic cultivation, especially agro-climatic suitability, cause not many areas suitable for garlic farming in Indonesia. Central Java Province is one of the centers of garlic production in Indonesia; Karanganyar Regency and Magelang Regency are two regencies with garlic planting area that exceeds other regencies in Central Java Province. The basic method of this research is descriptive analytical analysis. The results of the study stated that the implementation of garlic farming production factors in Karanganyar Regency was more in line with the recommended technology than in Magelang Regency. The implementation of production factors in the form of seeds and nitrogen fertilizers has not been efficient so it needs to be added.

Key words: *Garlic Farming, Efficiency, Production Factors, Seed, Fertillizer*

Metabolite Profiling of Resistant and Susceptible Coffee against Parasitic Nematodes (*Pratylenchus coffeae*)

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Abstract

The *Prathylenchus coffeae* is one of the important plant-parasitic nematodes in *Coffea canephora*. The present study dealt with the extraction of *C. canephora* roots with n-Hexane and GC-MS analysis of the prepared extract. This study examines the identification of metabolomics compounds related to plant defense against parasitic nematodes. Resistant coffee varieties, BP 308, and susceptible varieties, BP42 and BP 409, were used in this study. GC-MS data indicates the presence of forty-seven, thirty-nine, fifty components in roots BP 308, BP 42, and BP 409, respectively. All of the varieties have the same major metabolites that play an important role in nematode-resistant mechanism, these metabolites were 9-Octadecenoic acid (Z)-(CAS) Oleic acid. These compounds had different concentrations between BP 308, BP 42 and BP 409 varieties (24,76%, 6,89% and 9,75%, respectively). Resistant coffee was observed to have thrice higher levels of Oleic acid than susceptible coffee.

Key words: *GC-MS, Coffea canephora, nematode, root, oleic acid*

Application of Tofu Liquid Waste and Patchouli Dregs on the Growth of Oil Palm Seeds in Pre Nursery with Ultisol Media

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Abstract

One of the problems that causes the low productivity of oil palm plantations is in the nursery phase. The seeds used must come from superior and certified seeds, but the nursery media is also an important factor in supporting success, especially in pre-nursery. The planting media used usually have limited nutrient sources because they are planted in polybag. Fertilization is very important to support seedling growth. Therefore, liquid organic fertilizer is used from Tofu Liquid Waste and Patchouli Dregs. The study was designed in the form of a factorial Completely Randomized Design (CRD). The first factor is the LCTAN concentration consisting of 0 ml/l (T0), 25 ml/l (T1), 50 ml/l (T2), 75 ml/l (T3) and the second factor is the frequency of LCTAN administration which consists of 1 time. a week (F1) and 2 times a week (F2). Observations were made on initial soil analysis (pH, N-total, P-available and K-dd), analysis of tofu liquid waste and patchouli dregs (N, P and K) ,and seedling observations (seedling height, number of plant leaves, stem diameter, seedling weight, leaf area and seed normality). The results showed that the application of 50 ml POC LCTAN/l water and a frequency of 1 time a week could increase seedling weight with the highest yield reaching 1.29 g.

Key words: *Fertilization; Palm oil; Prenursery; Seedling*

Implementation and Success Rate of "Unit Pengolahan Pupuk Organik" (UPPO) PROGRAM

(Case Study on Koto Panjang Saiyo Farmers Group, Pauh, Padang City, West Sumatera)

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Abstract

"*Unit Pengolahan Pupuk Organik* (UPPO)" organic fertiliser processing unit is a program of the Ministry of Agriculture of the Republic of Indonesia under the Directorate of Fertilizers and Pesticides, also the Directorate General of Agricultural Infrastructures and Facilities, which implemented at the Regency/City level. It adopted in farmer groups to raise farmers' wealth from agricultural byproducts. Koto Panjang Saiyo Farmers Group is one of the groups that receiving this program. This research conducted to investigate the implementation and success rate of the UPPO program in Koto Panjang Saiyo Farmers Group. Program implementation indicated by the fertiliser production process, manure production, distribution of duty system and marketing. At the same time, the success rate indicated by the output, outcome, and benefit. It conducted with the study case method and collected data by questionnaire. The data analysed with a descriptive quantitative method. The results showed that the UPPO Program implemented successfully in Koto Panjang Saiyo Farmers Group, with no obstacles encountered and every factor (fertiliser production process, manure production, distribution of duty system and marketing) fulfilled. The implementation of the UPPO program at the Koto Panjang Saiyo Farmer Group categorised as successful. The output variable revealed a UPPO Unit established in the Koto Panjang Saiyo Farmers Group, backed with facilities and tools (compost house, fermentation pond, organic fertiliser processor, vehicle to transport the compost, livestock barn and the livestock). Then the outcome variable showed that the Koto Panjang Saiyo Farmers Group had produced 1.5 tons of organic fertiliser per month. Simultaneously, the benefit variable revealed that 82.00% of farmers' group members reduced inorganic fertiliser consumption, switched to UPPO products, and earned money from fertiliser sales.

Keywords: *Fertiliser, Implementation, Policy, Succes Rate, UPPO*

Analysis of Farmer's Decision in Sugarcane Farming in Situbondo District, East Java

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Abstract

In the last five years there has been a decline in the sugarcane planting area in Situbondo Regency, which is one of the centers of sugarcane cultivation in East Java. Various factors are assumed to be the cause of the decline in sugarcane planting area, which is mostly planted by farmers. A Views of them is the conversion of land, the uncertainty of sugar prices, the transition of commodities and the decline in farmers' interest in sugarcane farming etc. Some of these reasons form the basis of this research. This aims of this study are to analyze (1) the impact of internal, external and farm management income on farmer's decisions on sugarcane farming, and (2) the direct and indirect influence between internal and external factors on farmers' decisions in sugarcane farming. This study used a descriptive analytical method with 45 farmers as respondents. The study used scoring method and path analysis. The results of this study show that (1) significant factor that has direct effect on farmers' decisions are 52.5% of land tenure, and 37% about the sugar factory mechanism for rendemen. (2) The factors that most indirectly influence the decisions of farmers through farming income are 4.6% sugar cane production, and yield of 3.6%. Based on the results, it was suggested to the sugar factory for more transparency and digitization of yield measuring instruments. To achieve national sugar self-sufficiency, a partnership between sugar factories and local governments or other parties is needed to ensure the certainty of sugarcane land through land expansion.

Key words: *sugarcane, farmer decision, path analysis*

The Effect of Modified Sago Using Butanol Precipitation on the Physicochemical Properties

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Abstract

The Biodiversity of sago plants in Indonesia is very abundant. Sago starch can be obtained from processing of stem sago. Sago starch has been potential to be used for many applications in the food industry, medical, etc. However native sago has some disadvantages, such as too sticky, not resistant to acid, and high viscosity therefore modifying process of sago is needed. In this study, sago starch has been modified using butanol precipitation method with variation in precipitation time (1, 2, 3, 4, and 5 hours). That modification process has been done at room temperature. The modified sago starch analyzed of its physicochemical (amylose content, functional group using FTIR, water solubility, swelling power, moisture content, and morphology) properties. The result show that the optimum time for precipitation using butanol is 4 hours because it can be obtained the sago (sample B4) with the best characteristics, which are highest amylose content but lowest water solubility, swelling power, and moisture content.

Key words: *butanol, modification, physicochemical, precipitation, sago starch*

The Study of Law and Business Ethics to Support The Existence of Traditional Herb Business in Pamekasan Regency

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Abstract

Pamekasan Regency has production and development potency of traditional herb with the obstacles faced is fulfillment lack of legal aspects such as business licenses and/or products in supporting business operations so that it becomes obstacle to reach wider markets such as national and international markets. This study aims to analyze characteristics of traditional herb business and examine the regulations also legal issues in those business management in Pamekasan Regency. The data used are primary data which is analyzed using descriptive analysis to describe the characteristics of traditional herb business and review supporting regulations the existence of the traditional herb business. Those businesses are micro and small businesses with 95 percent not having legality on business and/or product licenses. Legality existence is an important element because it will affect the management of business in terms of establishing cooperation, access to capital, protected business locations, legal protection, and business development as stated in government regulations through Law no. 20 of 2008 concerning Micro, Small, and Medium Enterprises and PP. 7 of 2021 concerning Ease, Protection, and Empowerment of Cooperatives and Micro, Small and Medium Enterprises. In effort to develop business, the traditional herbal medicine business must be able to meet the safety and quality standards as stated in the Minister of Health Regulation No. 16 of 2021 and the Food and Drug Supervisory Agency Regulation No. 32 of 2019. Based on those regulation study, it is necessary to provide counseling to business actors so their awareness arises to immediately register the business that is run and the pro-active role of relevant agencies to accelerate licensing applications on helping business actors take care of business permits because the increase in Micro and small businesses that have licenses can empower to develop and survive in the midst of the competition in the herb industry.

Key words: *Business Ethic, Herb, Medicine, Law, Traditional*

Resistance Analysis Of Black Vine (Vitis Vinivera) Exposed To Extremely Low Frequency (Elf) Magnetic Field (ELF) 300µT and 500µT

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Abstract

Extremely Low Frequency (ELF) magnetic field is a component of electromagnetic waves with frequencies less than 300 Hz. The energy contained is very small, but is able to penetrate all biological matter. The research results reported to date are still contradictory. Some researchers reported that exposure to ELF magnetic fields was able to increase cell proliferation, and on the other hand reported that exposure to ELF magnetic fields could increase cell death or inhibit bacterial proliferation. This study aims to analyze the resistance of black grapes exposed to an ELF magnetic field with an intensity of 300 µT and 500 µT. This study used a completely randomized design, with soy milk samples and exposure to an ELF magnetic field intensity of 300 µT and 500 µT for 60 minutes and 120 minutes, respectively. The variables studied included the physical resistance of grapes with indicators of the number of grapes without spots, density, and pH of the grapes. The data from the pH and density research were analyzed using Mann Whitney and Kruskal Wallis statistical analysis, while the physical condition data were analyzed descriptively. The results showed that the number of grapes that developed spots was higher in the sample group exposed to the ELF magnetic field intensity of 300 µT and 500 µT compared to the control group. Conclusion: exposure to ELF magnetic fields with intensities of 300 µT and 500 µT accelerated the decay process of black grapes.

Key words: *Resistance of black grapes, ELF magnetic field*

Comparison Of The Quality Of Vermicompose From Some Sources Of Animal Waste The Different Results Of The Decomposition Of The Worm *Perionyx excavatus*

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Abstract

Vermicompost has the advantage of being able to improve chemical, pH (H_2O) pysical and biological properties, improve land quality and plant production. In addition, composting is time-efficient because its decomposition is assisted by *Perionyx excavatus* worms which are fast in breaking down organic matter. However, the quality of vermicompost differs according to the organic material used. Therefore research is needed to obtain the best quality of vermicompost based on the quality standard of organic fertilizer in the Regulation of the Minister of Agriculture Number 261/KPTS/SR.3101/M/4/2019. This research was conducted from January - March 2021 at the compost house, Soil Science Laboratory, Faculty of Agriculture, Bengkulu University at coordinates 102°16´12.71´´E 3°45´33,754´´S. This study was structured using a completely randomized design (CRD) with four treatments and six replications. Treatments were K1 : cow waste, K2 = buffalo waste, K3: chicken waste, K4: goat waste. Observation variables consist of: 1) The main variables are Total-N (%), Organic-C (%), C/N ratio, odour and texture, colour, worm weight (g). 2) Supporting variables are pH (H_2O 1:5 b/v), moisture (%) and temperature (°C). The results showed that: 1) The main variable was vermicompost from all animal manure sources based on the quality standard of compost in the SNI 19–7030-2004. 2) Based on the analysis of variance, the supporting variables that have a significant effect are pH (H_2O 1:5 b/v) and temperature (°C). 3) After the vermicomposting process, the Organic-C 19.71% (highest) at K1, the Total-N 2.41% (highest) at K3. The C/N ratio 11.92 (highest) was in K1. Odour and texture changed in all treatments from very smelly criteria to smell like soil. The colour changed in all treatments K1, K2, K4 from greenish to black and K3 from olive to grey. Worm weight decreased in all treatments and the smallest average weight of worm (0.6 g) in K3.

Keywords *: Chicken, Worm, Goat, Buffalo, Cow, Vermicompost.*

Physicochemical, Fatty Acid Composition and Antioxidant Properties of Mahogony *(Swietenia humilis* Zucc.*)* Seeds Oil: A Comparative study

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Abstract

This study aims to compare the physicochemical, fatty acid composition, and antioxidant properties of Mahagony (Swietenia humilis Zucc.) seeds oil. Conventional Soxhlet extraction (SE) and ultrasonic-assisted extraction (UAE) methods were used as models for comparative study. The result showed that UAE was able to provide a higher content of unsaturated fatty acids than conventional SE. In addition, Mahogany seed oil contained large amounts of edible linoleic acid and linolenic acid, which indicates that Mahogany seeds could be valuable sources of edible natural γ-linolenic acid products. The antioxidant activity of Mahogany seed oil obtained through the UAE provided a higher antioxidant capacity compared to the Mahogany seed oil obtained with conventional SE

Keyword: *antioxidant, ultrasonic-assisted extraction, Mahogany, Swietenia humilis Zucc.*

Re-Harvest Application Of Ga_3 Solutions Promoted Seed Dormancy Breaking In Potato Tubers

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Abstract

Seed dormancy has been known to cause a big problem for potato seed industry, as potato seed are dormant for about 12 weeks after being harvested. Attempts to cope with the problem have been done mainly by application of GA_3 solutions to the seeds after harvesting, considered unpractical and inefficient. The objectives of the research was to promote dormancy breaking of potato seeds by GA_3 solution application before harvesting the seeds. We run two experiemnts, *in vitro* and greenhouse experiment, in each of which GA3 solutions at different concentrations were applied. In *in vitro* experiment, GA_3 solutions (0, 20, 40, 60 ppm) were added to the growing media at different times (2, 4, 6 weeks before microtuber harvest). The time for seed germination, number of shoot emergence, and length of shoot were recorded. In the greenhouse experiment, potato seeds exposed to gamma rays (0, 30 Gy) were planted in the polybag containing 5 kg of top soil and manure (3:1, v/v). At 6 week after planting, the crops were sprayed with GA_3 solutions (0, 50, 100 ppm), repeated weekly until harvesting time. The variable measured included time for seed to germinate, sprout number, sprout height, leaf number, root length, and root number. We found that for *in vitro* experiment, GA_3 treatment did not signifficantly promoted dormancy breaking. Applying GA_3 long before harvesting promoted dormancy breaking. There is no significant effects on the interaction between GA_3 solution and application time. In the greenhouse experiment, the interaction between high GA_3 (100 ppm) and gamma rays irradiation (30 Gy) significantly promoted dormancy breaking and produced seedling growth before harvesting.

Keyword: *dormancy breaking, GA_3, microtubers, potato seeds*

Indonesian Cocoas Export Commodity : A Comparison in Competition and the Affecting Factors

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Abstract

Cocoa as one of many commodities in Indonesia is highly contributive towards Indonesia's foreign exchange is highly related to its policy. The government tax policy regarding export tariff in 2010 will affect cocoa commodities value in international trade. This research intends to analyze the competitiveness of cocoa commodities and to discover the factors that affect them. The competitiveness will compared to other competing countries such as Ivory Cost, Ghana, Netherlands, Cameroon, Ecuador, Nigeria, and Brazil. All data used is in form of secondary time series from of 1990 until 2019 by using Revealed Comparative Advantages (RCA), Market Share Index (MSI), and Ordinary Least Square (OLS). This research found that Indonesian cocoa commodities, such as, Cocoa Paste, Cocoa Butter, and Cocoa Powder have an RCA Value of >1, which have positive competitiveness. Moreover, with the MSI Value of > 0, It proves that Indonesian cocoa commodities have filled international demand, while processed chocolate products have not have competitiveness. Export tariffs, rupiah exchange rates, world prices, and the number of cocoa industries jointly have a significant effect on cocoa competitiveness, but partially have varying significance. Based on the results of the research, Indonesia should focus on exporting cocoa and cocoa powder, as well as fermenting cocoa beans.

Key words: *cocoa export, RCA, MSI, export tariff, cocoa industry*

Quality Comparison of Livestock Waste Through Vermicomposting with the help of *Lumbricus rubellus*

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Abstract

The potential for large amounts of livestock waste needs to be balanced with an increase in quality. This quality improvement can be made with the bioconversion process, which is the vermicomposting method. This study aims to determine the effect of vermicomposting on improving the quality of livestock waste. The study was conducted by utilizing the activity of the *Lumbricus rubellus* in bioconversion of livestock waste into compost (vermicompost). The parameters of livestock waste quality improvement observed were macronutrient content, N, P and K, C/N ratio, pH, and physical properties (texture, color, and odor) adjusted to the Vermicompost Organoleptic Score Standard (SNI 19-7030-2004). Data analysis showed that the process of composting livestock waste in the usual way by farmers showed lower parameter values when compared to vermicompost. Levels of N-total, available K, C-Organic, and pH in vermicompost show higher values. A decrease in the C/N ratio to a value of 18.22 is followed by an increase in the levels of N-total and C-organic. However, the results of the analysis showed lower P-available values. The physical quality of livestock waste that is processed by vermicomposting is better when compared to ordinary composting. This can be seen from the change in color, odor, and texture of vermicompost waste that has changed from day 21 to 30 days. While ordinary composting has not shown significant changes.

Keyword *: Vermicompost, Lumbricus rubellus, livestock waste, macronutrients*

Inhibition Of Betel Leaf Extract To Seedborne Pathogenic Fungi Of Rice Paddy Seeds

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Abstract

The quality of rice paddy seeds can be influenced by seed-borne pathogenic fungi. Testing of rice paddy seeds to be planted is important to do in order to know the quality of the seeds. Rice paddy seed-borne pathogens are one of the limiting factors for rice paddy production. The content of essential oil in betel leaf is thought to be able to control seed-borne pathogenic fungi infections. The purpose of this study was to evaluate the effectiveness of betel leaf extract in inhibiting the development of rice paddy seed-borne pathogens. The study was designed in a completely randomized design with two stages. The first stage used 2 treatments, namely rice paddy seed-borne pathogenic fungi species (A, B, and C) and the concentration of betel leaf extract (0.100, 200, and 300 ppm) repeated 3 times with the double culture method in PDA medium. The second stage used a single treatment, namely the concentration of betel extract in stencil paper medium using Ciherang variety rice paddy seeds and repeated 6 times. The results showed that from the double culture test, 100 ppm betel extract was the best at inhibiting the growth of seed-borne pathogenic fungi with isolate C being the most inhibited. Betel extract with a concentration of 300 ppm was the best in inhibiting the percentage of pathogenic fungal infections, but had a negative effect on germination length, germination percentage, normal germination percentage, abnormal germination percentage, and germination weight.

Key words: *Betel leaf extract, rice paddy seed, seed-borne pathogenic fungi.*

Separation and concentration of phycocyanin from Spirulina sp. using microfiltration membrane for natural pigment

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Abstract

Phycocyanin, a natural blue pigment extracted from microalgae Spirulina, has been used in dietary supplements and natural colorants in food, nutraceutical, cosmetic, and pharmaceutical applications. This water-soluble pigment exhibits antioxidant, anti-inflammatory, hepatoprotective and neuroprotective properties. Membrane technology has gained broad interest in the processing of biomolecules and liquids. This technique is practical, easy to scale up and used at ambient temperature, minimising thermal damage to the product. This study investigates the effect of microfiltration (MF) process on phycocyanin extracted from Spirulina sp. The crude extract was passed through a Dead End Stirred Microfiltration Cell (DESMF) with pore size 0.15 µm. The system was operated with constant rotation speed, 300 rpm at various transmembrane pressure 20, 30 and 40 psia. The results showed that most phycocyanin is retained in the MF retentate. The microfiltration processing at transmembrane pressure 40 psia increased phycocyanin with optimum concentration (0.48 mg/mL) and recovery of 98%. Total solids and dissolved protein in MF retentate at optimum condition were 1.98% and 2.94 mg/mL. The crude extract of phycocyanin exhibited free radical inhibition (74.55%) with significant improvement under microfiltration process (93.89%).

Key words: *phycocyanin, Spirulina, microfiltration, natural pigment, antioxidant*

Direct and Indirect Relationship Between Root And Shoot On Four Lowland Chilli Varieties (*Capsicum annum* L.)

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Abstract

The mechanisms of fruit formation on the growth of chilli plants are the results of both direct and indirect processes. The roots and shoots interact in their growth and function. These interactions undoubtedly reflect the interdependence of each organ for their fruit formation. This research was aimed to determine direct and indirect relationship between root and shoot on fresh weight fruit formation to four lowland chilli varieties. This study was designed using a randomized, complete block design (RCBD) consisted of 4 levels varieties namely Lembang-1, Kencana, Tanjung-2, dan Ungara. The results showed that fruit weight Tanjung-2 variety directly influenced by root lenght, dry weight root, leaf area, and plant height. Similarly, photosynthesis and transpiration rate in Kencana variety was indirect effect, while root lenght, root area, leaf area, and assimilate accumulation in root and shoot was directly effect to fresh weight fruit. In Lembang-1 variety, root conditions directly affected on photosynthesis rate, accumulation of nitrate reductase activity, plant height, and number of branch so that it affacted fresh weight fruit. Ungara variety fresh weight fruit can be affacted indirectly root lenght and nitrate reductase activity, but accumulation assimilate in root and clorophyll content was directly effect. It is concluded that fresh weight of four lowland chilli varieties had different responses to formation process.

Keyword : *Direct effect, indirect effect, four lowland chilli varieties*

The Effect Of Root Growth Regulator And Environmental Sanitation On *Salacca Edulis* Seedling In Sleman Regency

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Abstract

Indonesia is a tropical country that is rich on various fruits, some of superior fruits whose taste and aroma meet the favorite of many people. One of the fruits favored by the wider community is *Salacca edulis*, whether eaten fresh, or processed into sweets farmers to accelerate the root of plants, however the exact dosage is not yet known for its application in Salacca grafts. The purpose of this study was to determine the effect of rootone-F Growth Regulator Liquid and environmental sanitation on the growth of salacca seeds. The research was conducted on the field owned by farmers in Merdikorejo village, Tempel district, Sleman Regency on April-June 2018. The experimental design used Randomized Completely Block Design composed of 10 treatments and 3 replications. The treatments applied were: C0: Sanitation application without RGR (Root Growth Regulation), C1: Sanitation application and RGR apply at a dose of 1000 ppm, C2: Sanitation application and RGR apply at dose of 2000 ppm, C3: Sanitation application and RGR application at a dose of 3000 ppm, C4: Application Sanitation and RGR apply at a dose of 4000 ppm, C5: Non-sanitary and without giving RGR, C6: Non-sanitation and giving RGR at a dose of 1000 ppm, C7: Non-sanitation and giving RGR at a dose of 2000 ppm, C8: Non Sanitation and giving RGR at dose of 3000 ppm, C9: Non Sanitation and giving RGR at a dose of 4000 ppm, The results shown that the application of sanitation and the RGR liquid for roots at a dose of 3000 ppm had a significant effect on plant height, salacca weevil diameter, number of leaf midribs, root infection and P nutrition content on the leaf compared with control treatment. Whereas with the application of 4000 ppm of RGR, there is no significant effect on the observed Salacca parameters. The optimum dose of Rootone-F application and gives the highest yield is a concentration of 3000 ppm and be equipped with adequate sanitation application.

Key words : *growth regulator, salacca graft, environmental sanitation, root infections*

Intercropping Red Rice Genotypes with Mungbean and Application of Mycorrhiza-Biofertilizer to Increase Rice Yield with Reduced Inorganic Fertilizer Doses

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Abstract

Mycorrhiza-biofertilizer and intercropping with legume crops have been proven to increase yield of various crops. Growing rice under aerobic irrigation system has an advantage to intercrop rice with legume crops. The objective of this study was to examine whether application of organic and mycorrhiza-biofertilizer with reduced doses of inorganic fertilizer can increased yield of two amphibious red-rice genotypes intercropped with mungbean under aerobic irrigation system. The experiment was arranged with Split Split-Plot design with three blocks and three treatment factors, namely red-rice genotypes (AM-G4, AM-G10) as the main plots, intercropping (I0= monocrop; I1= rice+mungbean intercropping) as the subplots, and application of organic combined with mycorrhiza-biofertilizer (F1= NPK only, F2= NPK+organic fertilizer, F3= 60%NPK+organic+mycorrhiza-biofertilizer) as the sub-subplots. The results indicated that additive intercropping with mungbean and fertilizer combinations significantly affected several growth and yield components of the red-rice while both genotypes were different only in tiller number and percentage of unfilled grains. However, there were also significant interaction effects, i.e. F*I interaction on panicle number, filled-grain number and grain yield per clump, and F*I*G interaction on percentage of unfilled grains. Additive intercropping with mungbean and addition of organic (F2) and/or mycorrhiza-biofertilizer combined with only 60% NPK doses (F3) on average significantly increased red-rice grain yield compared with application of NPK only (F1), which means that addition of organic and biofertilizer was still capable of increasing red-rice yield although the NPK doses were reduced by 40%. However, under intercropping, red-rice grain yield was 59.99 g/clump (highest) in F3 treatment compared with 40.37 g/clump in F1 treatment, while under monocropped rice, grain yield was 38.50 g/clump with F3 treatment compared with only 24.12 g/clump (lowest) with F1 treatment. Therefore, additive intercropping with mungbean increased red-rice grain yield and application of organic and mycorrhiza-biofertilizer further increased grain yield of red rice under aerobic irrigation systems.

Key words: *red rice, biofertilizer, mycorrhiza, intercropping, mungbean*

Strategy to Increase Pine Sap Production in Banyuwangi Regency

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Abstract

Utilization of forest resources is an effort to increase the use value of the forest so that it can benefit the community. One of the uses of non-timber forest products for the benefit of humans is tapping pine resin. The sap produced by pine, namely gondorukem and terpentine, is widely used in industry. There are several factors that influence the increase in pine resin production in Banyuwangi Regency. This study aims to determine the internal and external factors and to determine the strategies that can be done to increase the production of pine resin in Banyuwangi Regency. The method used in this study is the SWOT method to analyze internal and external factors, while the analysis to determine the priority strategy for increasing pine resin production is carried out using the AHP (Analytical Hierarchy Process) method. The results of the analysis show that internal and external factors of increasing pine resin production include 1) maintaining good quality of pine resin so that consumer confidence remains, 2) increasing promotional activities, 3) establishing good relations with farmers and the government, 4) changing weather conditions. erratic, 5) recruit workers who are in accordance with education and 6) perform cost efficiency. Furthermore, to determine the priority strategy for increasing the production of pine resin in Banyuwangi Regency, it is carried out using the AHP (Analytical Hierarchy Process) method, which produces a priority strategy to improve the quality of pine resin and promotional activities.

Keywords: *Pine Sap, SWOT, AHP, Banyuwangi Regency*

Performance Of Ultrafiltration Membrane In Separating Corn (*Zea mays* var. *indentata*) Hydrolyzed For Fortificant Of Natural Folic Acid

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Abstract

Performance of ultrafiltration (UF) membrane in separating corn (*Zea mays* var. *indentata*) hydrolysate was performed to get concentrate that has potency as fortificant of natural folic acid. Separation of folic acid and all compound from hydrolysate white and yellow corn hydrolysate was conducted through UF membrane (20000 MWCO) fitted in Dead-End Stirred Ultrafiltration Cell (DESUFC) at room temperature, stirrer rotation 200, 300 and 400 rpm, and trans-membrane pressure (TMP) 20, 30 and 40 psia for 30 minutes. White and yellow corn hydrolysates are the result of hydrolysis of protease enzyme of *Rhizopus oligosporus* strain-C_1 0.025 and 0.075% (w/w dry dissolved protein) at pH 5 and 30 °C for 24 hours, respectively. The result of experiment activity showed that based on optimization of flux, the best performance of UF membrane for white and yellow corn hydrolysates were achieved at TMP 40 psia with fluxes of 0.0162 and 0.0243 mL/cm^2.min., respectively. Identification on molecular weight (MW) of folic acid from white and yellow corn hydrolysates displayed mass spectra with dominan monomer of folic acid are MW of 442.27 and 442.66 Dalton (Da.), respectively.

Keywords: *corn , hydrolysate, folic acid, DESUFC, concentrate*

Diversification of Processed Mushroom Products to Support the Leading Potential of Gondangmanis Village

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Abstract

Gondangmanis Village is a village located in Karangpandan District, Karanganyar Regency. The village has the potential in developing oyster mushroom food products, one of the community's main commodities. Gondangmanis Village has a Gondangmanis Mushroom Processing Business Group (KUPJ), which is engaged in mushroom commodity processing. In the 2021 Village Empowerment Development Program (P3D) the potential for mushroom farming has been diversified into processed food in the form of snacks (mushroom chips, mushroom nuggets, and mushroom pempek) with the product name "JAPIGO" which has legalized Intellectual Property Rights (HKI) and Home Industry Food Stairs (PIRT), from which previously were only sold as raw materials. The resulting product utilizes the potential of all parts of the mushroom or can be referred to as zero waste. The hood (pileus) is processed into mushroom chips, while the mushroom stalk (stipe) is the main ingredient for making mushroom nuggets and mushroom pempek. The method used in this activity uses an action research approach. To produce the diversified output of the mushroom processed products, training activities were carried out on the manufacture of mushroom chips, mushroom nuggets, and mushroom pempek by bringing in expert mentors. The results showed that the intervention through action research increased the value of mushroom products from those previously sold fresh to 3 processed products.

Key words: *diversification, mushroom, potential, zero waste*

Sustainability Analysis and Strategic Planning for Improving the Performance of the Coffee Agroindustry Supply Chain in Jember Regency

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Abstract

Processed coffee products in Jember Regency have the potential for added value from the coffee agroindustry. The development of coffee agro-industry centers should be viewed as the development of a system whose performance must always be measured. This performance measurement is related to the supply chain and marketing channels of the coffee agroindustry. This research was conducted in Jember Regency with the aim of analyzing the sustainability of the supply chain performance of the coffee agroindustry in Jember Regency. The analytical method used is Multidimensional Scaling (MDS) to analyze the sustainability status of the supply chain performance of the coffee agroindustry. The results of the analysis show that each dimension has two priority attributes including the ecological dimension, namely: 1) the potential of garden land, and 2) the level of soil fertility; economic dimensions, namely: 1) price stability, and 2) market reach; social dimensions, namely: 1) plantation extension workers, and 2) community empowerment; dimensions of technology, namely: 1) standardization of quality, and 2) community response to new technologies; institutional dimensions, namely: 1) extension institutions, and 2) marketing institutions. This study recommends a strategy to build partnerships between coffee farmers and agro-industry to improve the performance and sustainability of the coffee supply chain in Jember Regency.

Keywords: *MDS, AHP, Coffee Agroindustry, Supply Chain Performance.*

Potential Use Of Ultrafiltration In Concentrating CORN (*Zea mays* var. *indentata)* Hydrolyzate As Fortificant Of Natural Folic Acid

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Abstract

Concentration process of corn (*Zea mays* var. *indentata*) hydrolysate through ultrafiltration (UF) membrane (20000 MWCO) fitted in Dead-End Stirred Ultrafiltration Cell (DESUFC) was conducted as starting point (cell scale) toward modul scale in order to get concentrate product which has potential use as fortificant of natural folic acid. Concentration process of corn hydrolysate was performed under room temperature, stirrer rotation 200, 300 and 400 rpm, and trans-membrane pressure (TMP) 20, 30 and 40 psia for 30 minutes. Corn hydrolysates used in concentration process by UF membrane are yellow and white corn hydrolysates as a result of hydrolysis of corn by protease enzyme of *Rhizopus oligosporus* strain-C_1 0.025 and 0.075% (w/w, dissolved protein) at pH 5 and 30 °C for 24 hours, respectively. The result of experiment activity showed that based on recovery of folic acid, the best result of UF membrane (20000 MWCO) for yellow and white hydrolysates were achieved at stirrer rotation 200 rpm and TMP 40 psia. These best results generate concentrates with compositions of folic acid of 89.79 and 114.96 µg/mL, dissolved protein of 1.00 and 0.66 mg/mL, total solids of 28.8 and 27.96%, total sugars of 273.14 and 358.08 mg/mL, and reducing sugars of 37.10 and 54.95 mg/mL, respectively. In this process condition, recovery of folic acid from concentrates of yellow and hydrolysates were 102.62% (1.02-fold) and 7.81% prior to process. Identification on molecular weight (MW) of folic acid from yellow and white corn hydrolysates displayed mass spectra with dominan monomer of folic acid are MW of 442.73 and 442.54 Dalton (Da.), respectively.

Keywords: *corn (Zea mays var. indentata), hydrolysate, folic acid, fortificant, DESUFC.*

The effect of climate change perception on adaptation strategy: Evidence from potato farmers In East Java Indonesia

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Abstract

Adaptation to climate change has an essential role to improve agricultural productivity. This study investigated the effect of farmers' climate change perception on adaptation strategy. The cross sectional data was collected from 120 potato farmers in east java province of Indonesia using structured questionnaire. Three adaptation strategies were found during the survey, including change the variety, change the crop cultivation, and change the fertilizer usage. By controlling the basic characteristic of respondent, this study employed a multivariate probit estimation to understand the effect of farmers' perception on multi adoption of adaptation strategy. The finding indicated that, farmers who felt the temperature increase, they were more likely to change to change their variety. Likewise, when farmers felt the drought was increased, they tend to adopt the new variety and change the fertilizer usage. Therefore, the adaptation to climate change can be improved by providing climate information such as temperature, rain intensity and drought.

Key words: *Climate change, adaptation, multivariate probit, East Java, perception*

The Influence of Sustainable Marketing and Knowledge on The Purchase Decision of Organic Coffee in East Java Indonesia

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Abstract

Today's consumers do not only buy products according to their needs, but also buy products that can offer affordable prices, attractive products with good quality, product advantages, and the sustainability of a product from both an economic, environmental and social perspective. This study aims to analyzing consumer knowledge on sustainable marketing and the effect of consumer knowledge on sustainable marketing on purchasing decisions. This research was conducted in East Java Indonesia. Data collection in this study was collected through questionnaires. The sampling method in this study used a non-probability approach, namely purposive sampling and accidental sampling methods. Data analysis in this study using Partial Least Square (PLS) which is used to measure the effect of the independent variable on the dependent variable. Based on the results of the analysis, it can be seen that some consumers already understand the concept of sustainable marketing and sustainable marketing can influence consumer purchasing decisions on organic coffee products. Social and environment variables are proven to have a positive and significant influence on the purchasing decision on organic coffee products, but not for economic variables.

Key words: *Sustainable Marketing, Organic Coffee, Partial Least Square (PLS), East Java, Purchase Decision*

Determinants of Ready-to-eat Food Consumption in Central Java: An Evaluation of Healthy Food Concern in the Community

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Abstract

The Goal number 2 of Sustainable Development Goals (SDGs) is to end hunger, achieve food security and improved nutrition and promote sustainable agriculture. However, the busy daily activities make people choose ready-to-eat food rather than cooking at home. Likewise, the people of Central Java have the highest consumption of ready-to-eat food. This study aims to determine the determinants of consumption for ready-to-eat food as well as an evaluation of whether the people of Central Java are concerned about healthy food in their daily nutritional intake. Panel data analysis is used to estimate these determinants. The results showed that people who live in cities consume more of these ready-to-eat foods. Regional income and population have a positively significant effect on the consumption of ready-to-eat food. These findings indicate that urban people do not really care about the nutritional balance of the food they consume. The important principle of eating full is the main consideration in consuming for the people of Central Java. They have less concern to consume healthy food.

Key words: *consumption, healthy food, nutrition, ready-to-eat food, panel data analysis*

The Effectiveness Application of Urea Fertilizer Coated with Compost of Empty Palm Oil Bunch in Tablet Formula on Growth and Yield of Celery

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Abstract

Celery is classified as a minor leave vegetable. Nitrogen sufficiency is then important for gaining maximum growth and quality. The objectives of this study were: 1. to compare the efficiency of the application of two Nitrogen formula on growth and yield of celery. 2. to determine optimum dose of Nitrogen on growth and yields of celery. The research was conducted at the Experimental Station University of Bengkulu from February to April 2021. This study used a Completely Randomized Design, was arranged in Split Plot with 2 factors and 3 replications. The main plot was the formula of Nitrogen, consisting of granule urea and tablet urea (in the form of urea and oil palm bunch mixture) . The sub-plot was the Nitrogen doses consisted of 0 kg/ha, 69 kg/ha, 138 kg/ha, 207 kg/ha, 276 kg/ha. No interaction was found to influence growth and yield of celery. Treated plants using granule urea showed as equally effective as tablet urea on growth and yield of celery. The optimum N dose for plant fresh weight was 175.96 kg N/ha which resulted 84.48g in plant fresh weight.

Key words : *celery, anorganic fertilizer, tablet fertilizer, oil palm bunch ash*

Influence of Foliar Spraying of *Moringa oleifera* Extracts As Biostimulant on Growth of Singgalang Cabbage (*Brassica oleraceae* var. *capitata* L.)

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Abstract

Cytokinins are hormones involved in all aspects of plant growth and development. Zeatin is one form of the most common forms of naturally occurring cytokinin in plants. Fresh *Moringa oleifera* leaves have been shown to have high zeatin content and also macro and micro element. Trials were carried out to evaluate the effect of different concentration of *Moringa oleifera* leaf extract as biostimulant on growth of Singgalang cabbage. Singgalang cabbage (*Brassica oleracea* var. *capitata* L.) is a local cabbage cultivated by farmers on the slopes of Mount Singgalang, Agam, West Sumatera. In the greenhouse, four treatments were used: A (control), B (*M. oleifera* extract 1:64 v/v), C (*M. oleifera* extract 1:32 v/v) and D (*M. oleifera* extract 1:16 v/v). The result showed that *Moringa oleifera* leaf extract (1: 32 v/v) increasing some parameters including height, number of leaves, leaf area, wet weight and dry weight of Singgalang cabbage. 1: 32 v/v concentration of *Moringa oleifera* leaf extract significantly improves all parameters of vegetative growth of Singgalang cabbage.

Key words: *Biostimulant, Moringa oleifera. Concentration, Singgalang cabbage*

Bioactivities and Organoleptic Analysis of Dark Chocolate Probiotic as a Functional Beverage

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Abstract

One of the most widely used food products is probiotic beverages. Probiotics are drinks that contain lactic acid which is able to survive in gastric acidity in large enough quantities. Dark chocolate is chocolate that is not added milk or sugar, can be eaten or processed directly. Usually has a high percentage of cocoa content around 70% to 99%. The purpose of this study is to determine the antioxidant, antidiabetic activity and organoleptic analysis in probiotic beverages which were added dark chocolate compared without the addition of dark chocolate. Variations in the addition of dark chocolate were 1, 5, 10, 15 and 20% respectively with fermentation time for 24 hours. Antioxidant activity was conducted using the 2-diphenyl-1-picrylhydrazyl radical scavenging activity (DPPH method) and antidiabetic activity was conducted using the α-glucosidase inhibitory activity test. The results showed that there was an increase in inhibition of both activities antioxidant and antidiabetic on dark chocolate probiotic compare with probiotic no additional dark chocolate. Maximum antioxidant and antidiabetic inhibition on 10% dark chocolate were 85.93% and 54.75% respectively. The results obtained show that dark chocolate probiotic has the potential as an antioxidant and antidiabetic. Based on the organoleptic analysis data, the formulation of the dark chocolate probiotic drink was the most preferred in the PDC2 sample (addition of 5% dark chocolate) based on colour, aroma and taste, while the consistency was somewhat preferred.

Key words : *antioxidant, antidiabetic, dark chocolate probiotic, organoleptic analysis*

Effect of Application of Chicken Manure and *Pseudomonas flourescens* Bacteria on Growth and Yield of Shallot (*Allium ascalonicum* L.)

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Abstract

Studies on the cultivation of shallots (*Allium ascalonicum* L.) have been carried out to increase its growth and yield. The use of manure and bacteria that decompose organic matter is expected to provide nutrients that will be used for the growth of shallots. The aims of this study were 1. to determine the interaction effect of application of chicken manure and *Pseudomonas flourescens* bacteria; 2. the effect of application of chicken manure; and 3. the effect of application of *P. frourescens* on the growth and yield of shallots. The experiment was conducted in Panti village, Jember district in 2021. The experiment used a 4x3 factorial randomized design with three replications. The first factor is the dose of chicken manure i.e. no, 10, 15 and 20 tonha^{-1} and the second factor is the dose of *P. fluorescens* i,e. no, 10 ml, and 20 ml per shallots. The growth and yield of shallots were assessed from plant height, number of leaves, root volume, number of tillers, wet weight and dry weight of tubers. The results showed that there was no significant interaction between the dose of chicken manure and the dose of *P. flourescens* used except for the parameters of wet weight of tubers and dry weight of tubers. The best results were obtained from the application of 15 tons ha^{-1} of chicken manure and 20 ml of *P. flourescens* bacteria per shallots.

Keyword: *Allium ascalonicum L, chicken manure, P. flourescens bacteria, yield*

Factor analysis of the oleochemical industry in downstream industrial development based on palm oil: evidence from Lampung Province

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Abstract

The development of the palm oil downstream industry in the form of the oleochemical industry is one of the potential industries in Indonesia. The industry is supported by the potential of raw materials in the form of palm oil which is spread in several provinces in Indonesia. Lampung Province is one of the provinces that depends on regional income and exports from palm products. The development of palm oil products such as oleochemicals is important for maintaining the resilience of the oleochemical products supply for hygiene products during the COVID-19 pandemic, such as soap, hand sanitizer, detergent and so on. The demand for oleochemicals is growing in the country by an average of 12%. In addition, Indonesia is an oleochemical exporting country with an increasing demand to reach 3.87 tons in 2020 or US$ 2.57 billion and demand growth by 21% from 2019. However, the development of the oleochemical industry in Lampung Province has not shown a significant increase. The aim of this study is to determine internal and external factors in the oleochemical industry development in Lampung Province. This research is expected to be a guide in determining the direction of strategies and policies for the oleochemical industry development in Lampung. The method used in this research is a literature study to collect factors related to the development of the palm oil industry, surveys and expert interviews. Factor analysis uses decision-making analysis methods by IFE (Internal Factor Evaluation) and EFE (External Factor Evaluation) matrices. The results of the matrix analysis show that the most influential internal factors are the quality and continuity of the quantity of raw materials. External factors show that the commitment of the government has the most influence on the development of the oleochemical industry in Lampung Province.

Keywords: *oleochemical industry, factor analysis, industrial development, palm oil*

Insecticidal Activity of *Syzigium aromaticum* Leaves and *Allium sativum* Tubers Extracts Against Subterranean Termites *Macrotermes gilvus* Hagen (Blattodea: Termitidae)

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Abstract

Subterranean termite is a pest of estate crop, forest trees and buildings. Economic losses caused by termites are commonly very high. Termite control is usually conducted by applying synthetic insecticides which is harmful to the environment. Alternative controls that can be applied is botanical insecticides, such as extracts from *Syzigium aromaticum* leaves and *Allium sativum* bulb. The aim of this research was to determine the effective dose of *S. aromaticum* and *A. sativum* extracts against mortality and consumption rate of subterranean termites *Macrotermes gilvus*. Those plant extracts were tested in form of crude extract, non polar, semi polar and polar fractions. Lethal concentration (LC) 50 and 95 were analysed with Probit analysis. The results showed that the highest mortality value for *S. aromaticum* extract was polar fraction with an LC_{95} value of 94.58% and semi polar fraction of *A. sativum* with a value of 95.83% against termites at 72 hours after treatment. *S. aromaticum* extract polar fraction and *A. sativum* extract semi polar fraction also showed causing the same lowest consumption rate, which was 0% at the LC_{95} value. The results of this study can be used as a source of information on controlling subterranean termites *M. gilvus* by using botanical insecticides, especially the extract of *S. aromaticum* polar fraction and *A. sativum* semi polar fraction which are effective and environmentally friendly.

Keywords: *botanical insecticide, consumption rate, mortality, subterranean termites.*

EVALUATION OF THREE VARIETIES OF GARLIC AS SEEDS IN ALAHAN PANJANG, WEST SUMATRA

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Abstract

This study aims to test three national varieties of garlic that will be used as seed bulbs in Alahan Panjang. Alahan Panjang is the only garlic-growing area in West Sumatra. The obstacle encountered by farmers in Alahan Panjang is that the Lumbu Hijau variety that has been cultivated in Alahan Panjang for a long time. It produces non-uniform bulbs sizes with smaller bulbs weights. This resulted in not many farmers being willing to plant it. The testing of two other national garlic varieties is expected to provide a solution to this problem. This research was conducted in Alahan Panjang in July-December 2020. The research method used was a one-factor experiment in a Completely Randomized Design (CRD) with three varieties tested, namely Lumbu Hijau, Sangga Sembalun, and Lumbu Putih which were repeated three times. Data analysis showed that Sangga Sembalun and Lumbu Hijau were able to produce higher fresh bulbs weights per plant and higher dry weights of large bulbs than Lumbu Putih. The percentage of large bulbs that will be used as seed bulbs in Lumbu Hijau, Sangga Sembalun, and Lumbu Putih is still low, respectively 10%, 12%, and 17%.

Key words: *three varieties, garlic, seed bulbs size*

Niche marketing identification of Madura local corn *marning*

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Abstract

Madura is one of region in Indonesia that has the potential as a national food barn in East Java with its corn production. Corn has the potential to be developed into derivative products with more added value and longer chains, such as for Food, Feed, Fuel, and Fertilizer (4F) in all its parts. Madura local corn has been widely used as animal feed and corn rice for consumption. However, this condition does not provide a greater value in the national corn market. Although the availability of Madura local corn production is quite large. Based on the results of the identification of the local Madura corn market, it was found that a processed corn product known as Madura local corn *marning*. *Marning* is a snack made from dried corn kernels that are fried in hot oil. This condition provides an opportunity for the development of Madura local corn into snack products, so it is important to know the attributes that are important to consumers in consuming *marning* of Madura local corn. The method of determining the sample used in this study was purposive sampling based on the spontaneity factor. Data analysis used descriptive qualitative analysis and fishbein analysis. The results showed that the characteristics of the respondents were mostly women, unmarried status, aged 21-25 years, college students, last education graduated S1, income < Rp. 500,000 and there is no number of dependents in the family. Information about corn marning was obtained from a friend. The attributes considered are taste, product type, price, packaging label, packaging weight and type of packaging.

Key words: *Corn, Attributes, Niche, Market*

Dry matter and nitrogen accumulation of Madura local corn var. Elos on salt stress

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Abstract

Corn var. Elos is a local maize of Madura which is known to be tolerant of salinity or salt stress. This research objective was to determine the dry matter and nitrogen accumulation of Corn var. Elos under salt stress. Elos corn was planted in polybags containing 1:1 soil and sand media using a completely randomized design, then watered with salt content of 0, 100 and 200 mM every 2 weeks. Each treatment was repeated 8 times. Parameters observed were total plant weight, weight of plant parts (roots, stems, leaves, tassels, clumps, and seeds), percentage weight of plant parts, crown/root ratio, and total nitrogen content in roots, stems, leaves and seeds. . The data obtained were tested using one way anova and posthoc LSD SPSS 24. As a result, salt stress generally reduced the total weight and plant parts. Salt stress increased dry weight accumulation in leaves and stems and decreased it in cobs and seeds. Total nitrogen content in stems and leaves also increased in salt stress but decreased in seeds.

Key words: *corn, salt, dry, nitrogen, accumulation*

Development of Tea Bags from Tea Mistletoe (*Scurulla oortiana*), Tea Leaves (*Camelia sinensis*) and Stevia (*Stevia rebaudiana*) as Herbal Drinks Rich in Flavonoids and Potential Antioxidants

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Abstract

The trend of consuming herbal drinks shows a significant increase during the COVID-19 pandemic. Based on this phenomena, there is an opportunity to innovate in creating an herbal product that is safe and useful to reduce the severity of COVID-19 infection due to excessive inflammation through the intake of antioxidants. This study aims to develop tea bags from tea misletoe, tea leaves, and stevia as flavonoid-rich and potentially antioxidant herbal drinks. The herbal tea bag formulation in this research consists of a mixture of green tea, tea mistletoe, and stevia. These three ingredients were chosen because of the high of tea consumption culture in Indonesia and have been reported to have the capacity as antioxidants related to their flavonoid components. Tea mistletoe (*Scurrula oortiana*) is a parasitic plant in tea that is widely used traditionally in alternative medicine because of the presence of antioxidant compounds. The chemical compounds contained in each component play an important role in antibody activity and health. The herbal tea bags are made based on selected formulas from their sensory qualities. The herbal tea was evaluated the moisture and total flavonoid compounds contents, and the DPPH radical scavenging activity. The water content of the tea with the selected formula is determined to ensure compliance with the quality standard of the tea bag. Consumer acceptance of tea bag products is determined by a preference test using 30 panelists. The results showed that herbal tea bag prepared using formula with 25% of Stevia, 20 % of green tea and 80% of tea mistletoe produce the highest consumer preference. Antioxidant activity (DPPH radical scavenging activity) (IC_{50}) and total flavonoid compounds of herbal tea bag reached to 81.77 ppm and 252.3 ± 1.71 mg QE/g dry weight of the material, respectively and 8% of water content. based on the research results, it could be concluded that the herbal tea bag prepared using 80% of tea mistletoe, 20% of green tea and 25% of stevia has potentially developed as herbal functional drink.

Key words: *Tea Mistletoe, Stevia, Herbal Tea, Functional Beverage*

The Role Of Millenials Organic Agricultural Startups In Increasing Competence, Products, Income And Business Networks

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Abstract

A startup is a start-up company that has not been operating for a long time. In other words, startup means a company that has just entered or is still in the development or research phase to continue to find markets and develop their products. Currently, the term startup company usually refers to companies whose services or products are technology-based. However, we try to integrate information technology with agricultural activities, especially organic agriculture. Organic farming is an agricultural system that we are already familiar with. Organic agriculture is one of our ways to achieve food security and sovereignty to sustainable agriculture. Although the prospects for organic agriculture in the domestic market are also foreign markets, problems that arise in the organic farming system still need to be addressed, including: The availability of human resources (HR), especially the younger generation / millennials, is still very limited. Organic fertilizers are still accompanied by chemical fertilizers by farmers in general. Control of biological pests and diseases is considered expensive, the area environment is not isolated, the production results tend to be small, the price of organic vegetables tends to be more expensive, information and education are still lacking, and there are no regulations that support more firmly related to organic farming systems. The research was conducted for three months from June to August 2021, on 30 millennial organic farmers in Sukabumi Regency. The method used is exploratory, with sampling using purposive sampling and analysis test tools IPA (Important Performance Analysis) and Chi Square to see the relationship between the observed variables. The results obtained show that competence and products are the main priorities, while income is the priority that is maintained, and business networks are of low priority. There is a relationship between the role of millennials organic farming startups with increasing competence, products, income and business networks.

Keywords: *Millennials startup, organic farming, competence, product, income, network effort, exploratory, IPA and Chi square.*

Analysis Active Compounds of *Carica papaya*, *Averrhoa bilimbi* and *Chromolaena odorata* leaves from Geothermal Area

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Abstract

The leaves of papaya plants (*Carica papaya*), belimbing wuluh (*Averrhoa bilimbi*), and seurapoh (*Chromolaena odorata*) have been traditional medicine such as wound healing. In this research, papaya, belimbing wuluh, and seurapoh leaves were identified and analyzed for the metabolite contents from the geothermal area. Seulimum is a geothermal area with geographical position 5˚28'51" North Latitude and 95˚43'53" East Longitude and altitude 1800 meters above sea level, minimum air temperature 19-21˚C, and maximum 25-30˚C, and Rainfall ranges from 2000-2500 mm per year. This analysis aims to determine the phytochemical compounds contained in C. papaya leaves. The maceration methods have been used in phytochemical screening studies. The results showed from qualitative techniques. In this study, phytochemical screening on 3 plants, namely *Carica papaya, Chromolaena odorata, and Averrhoa bilimbi*. Qualitative analysis of papaya leaf extract showed a positive reaction for alkaloids, flavonoids, saponins, phenols, steroids, and tannins. Seurapoh leaf extract showed a positive reaction to Mayer, Wagner, and Dragendorff. Positive results on tannins, steroids, flavonoids, terpenoids, phenols, and saponins. While star fruit extracts only negative tannins. The Liebermann-Burchard test showed a positive result. These results can be used as the basis for selecting plants from geothermal areas as candidates for wound healing.

Keywords: *Carica papaya, Averrhoa bilimbi, Chromolaena odorata, bioactive compounds*

Increasing the Institutional Capacity of Mushroom Processing Business Groups (KUPJ) through Partner Network Expansion

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Abstract

Mushroom Processing Business Group (KUPJ) Gondangmanis has been a farmer group engaged in mushroom processing since 2019. Along with the development of the business scale, partners are needed to support the development of the business. This study aims to (1) identify factors that can increase institutional capacity and (2) formulate a strategy for increasing the institutional capacity of KUPJ Gondangmanis through the development of a network of partners. The approach in this research is descriptive qualitative with data collection techniques used are: observation, documentation, and in-depth interviews. The results of this study indicate that (1) the factors that increase the institutional capacity of mushroom processing business groups are internal factors (local leadership, group motivation, and intensity of meetings) and external factors (local government support, partnerships, and external assistance) and (2) a strategy to increase the capacity of the Gondangmanis KUPJ through expansion of partnerships carried out in partnership with the Family Welfare Empowerment group (PKK), the Office of Cooperatives and Small and Medium Enterprises Karanganyar, Karangayar Health Office, Bejen and Ndalem Makuthoromo souvenir centre.

Keywords: *capacity, institutional, partnership*

Antibacterial Activity Of Fermented Katuk Leaves (*Sauropus androgynus* (L.) Merr.) Against Gram Positive Bacteria And Its Free Radical Inhibitory

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Abstract

Katuk leaves (*Sauropus androgynus (L.) Merr.*) contain bioactive that protects cell structures, increases vitamin C's effectiveness, prevents bone loss, and acts as an anti-inflammatory. Another function is to work directly as an antibiotic by interfering with bacteria or viruses and increasing the body's immunity. Kombucha contains organic compounds beneficial for the body, such as antioxidants, polyphenols, organic acids produced and antibiotics. Based on the above background, this study aims to evaluate the antibacterial activity of fermented beverages from katuk leaves against gram-positive bacteria. The diameter of the inhibition zone (DZH) using the agar diffusion method with positive control of streptomycin sulfate was calculated. In addition, the inhibition of free radicals was evaluated. In this study, katuk was fermented with SCOBY (*a symbiotic colony of yeast*) concentrations of 10, 15 and 20% and sucrose concentrations of 15% with a fermentation time of 0 and 12 days. The results showed that fermented katuk with a 20% culture showed optimum antibacterial activity against *Staphylococcus aureus* bacteria with an inhibition zone of 20 mm and a percentage of free radical inhibition of 96.98%.

Keywords: Katuk (*Sauropus androgynus (L.)Merr.*), SCOBY, antibacterial, free radical inhibitory.

Tolerance Level of Upland Rice Lines in Aluminum Stress

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Abstract

Aluminium can have harmful effects on plant growth both directly and indirectly. This study aims to examine the tolerance level of lines of rice plants to aluminium stress in ultisol soil. This research was conducted from february 2020 to may 2020 in the Experimental and Research Field of Faculty of Agriculture, Fisheries and Biology, Universitas Bangka Belitung. The experimental design used a Factorial Complete Randomized Design (FCRD) consisting of 2 factors. Factor1 were 10 F_6 rice lines and 2 check varieties. Factor 2 were P_0 as control (0 ppm) and P_1 is stress Al 200 ppm. The results showed that plant varieties had very significant effects on plant height, leaves number, productive tillers number, root length, panicle length, flowering age, harvest age, weight of pithy seeds and number of pithy seeds, but no significant effect on root volume. The application of 200 ppm aluminium have not a significant difference with the control treatment (0 ppm aluminium) for all observed characters. Based on the results showed that all f_6 rice line tested had a score 1 (tolerant) of alumunium stress in ultisol soil.

Keywords. *Aluminium Stress, varieties, Tolerance, Red Rice, Promising Lines.*

Nutrient content and physical characteristics linkage of palm kernel meal and coconut meal after wet separation using molecular weight approach

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Abstract

The use of palm kernel meal and coconut meal is restriction in feed due to the high crude fiber content, caused by the mixture of shells. This study aims to analyze the nutrient content, i.e., crude protein and crude fiber of palm kernel meal and coconut meal before and after using wet separation and molecular weight approach. The wet separation process for palm kernel meal and coconut meal was carried out for 6 hours to obtain a precipitate. The palm kernel meal and coconut meal that have been separated is divided into 3 fractions, i.e., upper, middle and lower. Each fraction was analyzed for crude fiber and crude protein content for chemical characteristics, and bulk density (g l^{-1}), compacted bulk density (g l^{-1}), specific gravity (kg l^{-1}), angle of purpose (^{o}). Crude protein and crude fiber content of palm kernel meal before being separated by wet separation were 11.72% and 13.11%, for coconut meal were 12.65% and 8.67%. The fraction of palm kernel meal has the highest crude protein content of 22.21% with the lowest crude fiber content 9.68%. Coconut meal in the middle fraction had the highest crude protein content 18.92% and the lowest crude fiber content of 11.95% in the upper fraction. The physical characteristics of the upper fraction of palm kernel meal and coconut meal had the lowest values ($P<0.05$) of specific gravity (kg l^{-1}), bulk density (g l^{-1}) and compacted bulk density (g l^{-1}). It can be concluded that the wet separation process with the molecular weight approach is able to change the nutrient content of each fraction and can minimize the mixture of shells in palm kernel meal and coconut meal.

Key words: *crude fiber, chemical characteristics, fractionation, gravity*

Dry Storage and Temperature Condition on Germination of Sugarcane (*Saccharum officinarum*) Synthetic Seeds

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Abstract

Sugarcane (*Saccharum officinarum*) is one of the commercial crops in Indonesia. Propagation of sugarcane with tissue culture has been known for a long time and somatic embryogenesis is one of technique that widely used. Embryogenic cells which contain of totipotent cells were suitable for efficient germplasm conservation. Conservation efforts need to be carried out to improve the superior varieties of sugarcane. One of them is synthetic seed technology. Synthetic seed technology is a way for short to medium term storage of tiny part of plant in artificial capsule. Application of synthetic seeds is more intended for conservation and maintenance of genotypes that can be carried out with a minimum growth of storage. The sugarcane synthetic seed technique through minimal growth in this research was carried out by adding inhibitory compounds, and decreasing temperature. The objective of this research is to determine the right ABA concentration and temperature in inhibiting sugarcane synthetic seed germination, and to find out the germination after the storage period. This research was run in 3 stages of research, which were inducing somatic embryos in coleoptile form, synthetic seed encapsulation and storage process, then germination and regeneration of synthetic seed. The main research used a Completely Randomized Design (CRD) with two factors, ABA concentration (0, 1.5, 3, 4.5, and 6 mgL^{-1}) as inhibitory compound and temperature (4°C and 25°C). The results were obtained that (1) in the A4S1 treatment (ABA 6 mgL^{-1} and temperature 4°C) gave the best results for inhibiting germination than all treatments until 4th week, (2) ABA application in different concentration at 25°C storage didn't show well development seed, (3) the successful of plantlet regeneration from synthetic seeds germination is shown in A4S1 treatment with 84,33% of plantlet regenerated.

Key words: *ABA, somatic embryo, coleoptile, regeneration*

The Distribution Of *Spodoptera frugiperda* J.E Smith (LEPIDOPTERA: NOCTUIDAE) And Its Natural Enemies In West Sumatera

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Abstract

Fall armywarm, often known as FAW, is an invasive insect that was first detected attacking corn in March 2019 in Pasaman Barat district, West Sumatra province. FAW attacks have now spread to almost all regions in Indonesia, with varying intensities of attacks. There are no reports of natural enemies of FAW that can be used as biological control agents. The aim of the study was to determine the distribution of FAW and parasitoids associated with this pest and potential as FAW control agents. The study was conducted by surveying 4 districts, central of maize in West Sumatra. Samples were selected from lowland represented by the districts of Pasaman Barat and Padang Pariaman. Samples in the highlands were taken in Tanah Datar and Limapuluh Kota districts. For each district, 3 sub-districts were selected with 2 village, and each village was given one observation area. The sampling technique on the land was carried out using the *purposive random sampling* method, that is, choosing plants that are symptomatic of being attacked. The study was conducted in March – September 2021. FAW larvae were taken from the affected plants and placed in plastic cup. Then they are reared until they become imago and become parasitoids if they are parasitized. The parasitoids were identified based on morphology and referred to several literatures. The parasitization level of each parasitoid was calculated from the number of larvae reared and the parasitoids that emerged. The results showed that FAW has spread to all districts in West Sumatra. Parasitoids were identified as Hymenoptera, species *Microplitis* and *Chelonus* of the family Braconidae. The parasitoid *Charops* sp. from Ichneumonidae, and two parasitoids from the family Ichneumonidae. The highest level of parasitization in FAW larvae were *Chelonus* sp. in Luhak nan Duo district and *Microplitis* sp. in Pasaman district, Pasaman Barat Regency.

Keyword : FAW, parasitoid, parasitization, hymenoptera

Analysis Of The Effectiveness Of Farmers' Food Corporate Program And Its Influence On Business Sustainability Pt. Pamarican Village Partner

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Abstract

Social and economic institutions are complex socio-cultural mechanisms that have strategic roles and functions to accelerate development.PT. Mitra Desa Pamarican (PT.MDP) is one of the Farmer Food Corporations (KPP) in Ciamis Regency. This study aims to analyze the effectiveness of the farmer food corporation program, and how it affects the sustainability of PT MDP's business. The research method used is a survey method with a mixed method approach, which is a combination of qualitative and quantitative approaches. The sample in this study were lowland rice farmers who are members of the Farmers' Food Corporation in West Java which is under the management of PT. MDP. The number of samples of farmers in the study were 51 respondents. The effectiveness of the program is analyzed through a descriptive approach. The influence of the program on the business sustainability of PT. MDP was analyzed by Structural Equation Model (SEM) Partial Least Square (PLS). The results showed that the program was running effectively and all identified variables that significantly affected the effectiveness of the KPP services constructed by the manifests, although the levels varied from the largest contribution to the moderate level. Partially, the effectiveness itself is constructed by five manifest variables, with the order of contributions from highest to moderate, namely program objectives, real change, program socialization, accuracy and monitoring. The effectiveness of the implementation of the farmer food corporation program has a significant effect on the business sustainability of PT. MDP.

Keywords: *effectiveness, sustainability, farmer's food corporation*

Family Medicinal Plant Business Development Strategy through Digital Marketing to Realize Competitive Village Superior Products

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Abstract

The Business Group for Increasing Prosperous Family Income (UPPKS) in Ngunut Village is engaged in the cultivation and processing of family medicinal plants. This group consists of 20 people of Family Welfare Empowerment (PKK). UPPKS group has been producing processed toga since 2016, but the product value proposition is still low because there has been no further development effort. This empowerment activity aims to formulate a strategy for developing a family medicinal plant business through digital marketing. The empowerment method used is participatory rural appraisal, with stages (1) identification potential problems and community needs, (2) alignment with local government, (3) preparation of programs with the community, (4) program implementation, and (5) monitoring and evaluation. The results of this community service show that the family medicinal plant business development strategy is product diversification, packaging improvement, brand registration and P-IRT, digital marketing training, use of social media and marketplaces for marketing, and institutional scale up. These various strategies are used to realize superior village products that have competitiveness. This development activity impacts (1) sales volume increasing by up to 30 kg every week, and (2) increasing people's income to double every week. The results of this community service show that the family medicinal plant business development strategy is product diversification, packaging improvement, brand registration and P-IRT, digital marketing training, use of social media and marketplaces for marketing, and institutional scale up. These various strategies are used to realize superior village products that have competitiveness. This development activity impacts (1) sales volume increasing by up to 30 kg every week, and (2) increasing people's income to double every week.

Keywords: Strategy, medicinal plants, digital marketing

Stages and Measures of Artificial Insemination Innovation Adoption on Cattle Farmers in Agam Regency in West Sumatera

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Abstract

The research conducted to investigate stages and measures of adoption of artificial insemination innovation on cattle farmers in Agam Regency, West Sumatera. It conducted with a survey method and supported by an observation method. The respondents of this research were cattle farmers who adopted an artificial insemination innovation. There were ninety-six cattle farmers as respondents that determined by proportional sampling methods. They come from Canduang District, Ampek Angkek District, Tilatang Kamang District, and Baso District. The data collected with the Lickert Scale questionnaire to investigate the stages and measures of innovation adoption then analysed with the descriptive quantitative method. The result showed that cattle farmers' stages of artificial insemination adoption were in according to the process (awareness, interest, evaluation, trial, and adoption). In contrast, the cattle farmers adopted the artificial insemination innovation fastly, massively, and with good intensification.

Key words: *Artificial Insemination, Inovation Adoption, Measures of Adoption, Stages of Adoption*

Cost-Benefit Analysis On Transforming Conventional Food Businesses into Canning Businesses During Covid-19 Pandemic

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Abstract

During the Covid-19 pandemic, traditional food businesses are suffering a significant disruption by the enactment of a dine-in and travel restriction policy. Several firms can cope with this situation by transforming into a takeaway or ready to eat (RTE) processed food business and adopting digital marketing. However, the cost-benefit of the transformation is still unclear in a long-term period. Therefore, this study tries to comprehend the actual economic advantages (or disadvantages) of the phenomenon. This paper highlights three cases of small-scale processed food canning businesses that can withstand the pandemic situation. By employing cost-benefit analysis, this study unpacks three important findings. First, due to large investment requirements for infrastructure and equipment, the canning businesses payback period is more than five years. This could hinder most small-scale businesses to build their own canning facility and choose to co-manufacturing with existing canning firms, yet with higher operational costs. Second, transforming conventional dine-in into canning businesses can sustain the revenue stream of the firms during the pandemic. Two firms are able to increase their revenues by expanding the sales area through digital channels and increasing co-manufacturing orders. Lastly, the newly transformed canning business struggles from gaining permits and acquiring customers in the digital marketplace. Hence, the firm needs to prepare more capital in avoiding burnout in the initial phase of the transformation. Overall, this paper provides an incremental theoretical contribution by adding new cases on the implementation of the cost-benefit analysis approach. The practical implication is also provided from the explanation of the findings.

Key words: *cost-benefit analysis, processed food, small-scale canning.*

Analysis of Major Constraints on The Development of Non-Smoking Tobacco Derivative Products in Jember Regency

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Abstract

Tobacco has a big role in increasing the regional acceptance of East Java Province, especially in East Java Regency. But the statement contradicts the health issue that is a global problem, where the rate of cigarette use continues to increase, especially in Jember Regency, the proportion of smoking in the population aged ≥ 10 years reaches 27.88% every day. This could have major consequences for tobacco farmers, feared to lead to a decline in family income and social instability in tobacco production areas. This study was conducted in Jember Regency with the aim to analyze the main constraint factors for the development of non-smoking tobacco derivative products in Jember Regency. The analytical method used is *Interpretative Sructural Modeling* (ISM) to analyze constraint factors that are appropriate to the conditions. The results of the analysis showed that capital limitations became the main obstacle to the development of non-cigarette tobacco derivative products. The strategy that must be developed is capital limitations are a key factor that needs to be overcome in the development of non-smoking tobacco derivative products in Jember Regency.

Keywords: *ISM, Tobacco, Non-Smoking, Main Constraints.*

Analysis of Sustainable Arabica Coffe Agribusiness Development Activities during the Covid-19 Pandemic in Ijen Raung, Bondowoso Regency

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Abstract

Bondowoso Regency is one of the fourth largest coffee producers in East Java. In 2020 the coffee area is 17,700 ha with a production of 10,285 tons consisting of Arabica coffee and Robusta coffee. However, when viewed in terms of quality and price, Arabica coffee has a better advantage than Robusta coffee, so that the people of Bondowoso Regency develop more Arabica coffee. Areas that have the potential to develop Arabica coffee agribusiness are in the Ijen Raung area. Currently, Arabica coffee farmers in the region have problems where the COVID-19 pandemic has caused a decline in Arabica coffee prices, sales and limited promotional events held by local governments. So that the income of Arabica coffee farmers in Ijen Raung decreases. This study aims to analyze the activities of sustainable Arabica coffee agribusiness development during the COVID-19 pandemic in Ijen Raung, Bondowoso Regency. The method used in this research is ISM analysis to produce appropriate and interpretable development activities. The results of the analysis show that the formulation of local government policies as well as monitoring and evaluation of policies are key factors needed in sustainable Arabica coffee agribusiness development activities during the COVID-19 pandemic in Ijen Raung, Bondowoso Regency.

Key words: Arabica Coffe, Agribusniness, Strategy, ISM, Ijen Raung

The Dipping Effect on Lime Solution (*Citrus aurantifolia*) For Interior Quality And Total Bacteria Of Egg Laying Hens

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Abstract

The effectiveness of lime is widely known as natural anti-microbial but the exploration for preservation material for egg was conducted into a lesser extent. The objective of this study was to examine the effect of lime solution for interior quality and total plate count (TPC) at sixty four of egg laying hens. The experiment was arranged in a completely randomized design (CRD), consisting of 4 treatments (T0 = control; T1=25%; T2=50%; T3=75% of LS) and three replications. The experiment was conducted during a month and divided into four times testing each week. The measurement parameters were air cell size, yolk index, albumen index, pH of egg, haugh unit and TPC. Data of interior quality were analysed using one way ANOVA with homogeneity and normality tested in advance while TPC was tested by descriptive analysis. The result explained that dipping eggs on LS highly significant affected ($P<0.01$) air cell size, albumen index, and haugh unit. However, it was not affecting ($P>0.05$) toward pH value and yolk index of laying hens. Meanwhile, the level of lime solution (LS) recommended to maintain the quality of egg and avoid the entry of bacterial was 75%.

Key words: *Lime solution, Interior quality, Total plate count, Egg laying hens.*

Effect of lignocellulolytic fungi to biodegradation of different type of organic waste derived from cocoa production

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Abstract

Cocoa production provides considerable amounts of organic wastes, for instance cocoa pod husks and pruning wastes that potentially support the long-term cocoa sustainability due to their strong connection with soil fertility improvement. Unfortunately, organic wastes degradation in the cocoa farms usually takes a bit longer time as related to the dominant of recalcitrant materials such as lignin. This study aims to evaluate the ability of lignocellulolytic fungi isolated from cocoa farms to degrade different types of organic wastes. A two way completely randomized design was implemented with six different treatment of fungi inoculants, i.e. control (D1), commercial decomposer (D2), fungi isolate 1 (D3), fungi isolate 2 (D4), fungi isolate 3 (D5), and fungi isolate consortium (D6), and three different types of organic residues, i.e. cocoa pruning wastes (B1), cocoa pod husks (B2), and the combination of pruning waste and cocoa pod husk (B3), used as factor experiments. The parameters including degradation rate of organic residues, organic C and total N were observed following 60 days decomposition at room temperature. The analysis of variance was used to see any significant difference of treatment effect to parameters. Results suggest that the consortium fungi inoculants application in combination with mixture of cocoa pod husks and pruning residues (B3D6) demonstrate the significant increase in the total N, and with corresponding to the decrease in the organic C content of the composted materials in compare to different treatments. The cocoa pod husk weight loss shows a higher value of 86%, followed by B3 of 52%, and B1 treatments with 38% from the initial condition, resulting from both single and consortium fungi inoculant applications. Our results suggest the potential effect of consortium fungi inoculants to improve the quality of composted materials and degradation rate of organic matter after 60 observation days.

Key words: *Biodegradation, cocoa pruning waste, cocoa pod huss, lignocellulolytic fungi*

Production of Black Garlic from Local Garlic Varieties Lumbu Hijau at Various Aging Times

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Abstract

The purpose of this study was to determine the effect of aging times on the physical, chemical, and bioactive characteristics of black garlic from a local garlic (Lumbu Hijau) variety and determine the appropriate aging time for the production of black garlic with good properties. This study used a single completely randomized design (CRD), namely aging time (7 days, 14 days, and 21 days) with three replications for each treatment. The results of the analysis showed that the aging time used in the manufacture of black garlic from local Lumbu Hijau garlic varieties significantly affected the color intensity, water content, protein content, fat content, ash content, carbohydrate content, total reducing sugar, total phenol, and antioxidant activity ($p \leq 0.05$). The appropriate aging time for the production of black garlic from the local Lumbu Hijau garlic variety is 14 days, which gives a yield of 80.81%; texture of 8.90 g /5 mm; color intensity 0.52%; water content 61.77%; protein content 16.65%; fat content of 1.28%; ash content 4.05%; carbohydrate content of 29.82%; reducing sugar 3.94%; total titrated acid (TTA) of 0.26%; acidity (pH) 3.01; total phenol 0.91%; and antioxidant activity 61.62%. It can be concluded that the production of black garlic from Lumbu Hijau offers good potential for development because it has a higher bioactive content than imported black garlic. The next step needs to be a diversification of the processed food products made from black garlic derived from Lumbu Hijau.

Keywords: *Black garlic, lumbu hijau, aging time, bioactive characteristics.*

Study Of Different Cuttings Sources And Synthetic Growth Regulatory Substances Against Successful Rate Of Long Pepper Cuttings

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Abstract

Long pepper (*Piper retrofractum* Vahl.) is an important medicinal plant in the medicinal industry in Indonesia. Long pepper is grown by cuttings, but the obstacles encountered in planting through cuttings are easy to wilt and slow growth. The use of cuttings sources and the provision of synthetic growth regulators (PGR) is one of the efforts to increase plant cuttings growth. This study aims to determine the effect of the source of the cutting material and the provision of synthetic PGR on the success rate of cuttings growth of Javanese chili. The study used a Completely Randomized Block Design (CRBD) with two factors. The first factor was the source of the cutting material, which consisted of 3 levels, namely the shoot, the middle, and the bottom, and the second factor was the concentration of synthetic PGR, which consisted of 4 levels, namely 0, 1000 ppm, 2000 ppm, and 3000 ppm. The results showed an interaction between the source of the cutting material and the administration of synthetic PGR on the variables of shoot length, number of shoots, number of leaves, stem diameter, and root length. The combination of the sources of the shoot cuttings and synthetic PGR concentration of 3000 ppm was the best result for the successful growth of Long pepper cuttings.

Keywords: *auxin, Rootone F, medicinal plant, soil tendrils*

Soybean Institutional Management Strategy in Indonesia: Value Chain and SWOT Approach

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Abstract

The causes of the increase in soybean commodity prices is due to scarcity on the supply side which is proven to be able to make the government to explore the problem and make it solution. The objective of this research is to find out the value chain of soybean production from upstream to downstream and to know the institutional model of soybean supply management. The results of the analysis using the value chain and SWOT indicate that the strategy for increasing soybean production towards soybean self-sufficiency is through simultaneous empowerment of all parameters of the production technology component so that the synergistic impact can be felt at the level of the farmer subsystem as a producer and the small processing industry subsystem as consumers and the community consuming processed products. soya bean. Changes in people's consumption patterns have placed soybeans not only as a source of vegetable protein, but also as a source of functional food and have high economic competitiveness. Soybeans have strategic value in increasing national food security in a sustainable manner.

Keywords: *Soybean Institutions, Value Chain, SWOT, Food Security*

The effect of hot compressed water on ion released of a wasted biomass treatment

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Abstract

Hot compressed water is recently used as a pre-treatment of biomass with many utilization. On renewable energy field, the HCW has been implemented to degrade the wasted biomass, another utilization is to recover nutrients from agricultural biomass. One of the influence of HCW treatment is the ion released from the biomass. The objective of this study is identifying the effect of temperature and holding time of HCW treatment on the ion released by the wasted biomass. Some selected ions are natrium (Na^+), kalium (K^+), Phosphate (PO_4^{3-}) and Ammonia (NH^{4+}). The HCW temperature of this study are 130, 150 and 180 degree Celsius with the holding time for 15, 30, 45, 60, 90 and 120 minutes. After the treatment, the ion of the samples are measured using ion chromatograph. The result shows that the high temperature HCW achieved high Natrium and Kalium ion released. While low phosphate and ammonia gained at temperature 130^{o}C.

Key words: *hot compressed water, thermal treatment, ion, waste*

Determinants of Tobacco Supply in Indonesia: Generalized Method of Moment Approach

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Abstract

The development of the domestic cigarette industry and the increasing consumption of kretek cigarettes have caused the need for raw materials for tobacco to increase. If viewed from the demand side, the number of people who smoke in Indonesia is always increasing from year to year and cigarette consumption in Indonesia is 5.6 cigarettes per day per capita. This has implications for the high public consumption of tobacco, where increasing cigarette consumption will have an impact on increasing demand for tobacco and domestic tobacco prices. However, tobacco farmers tend to be slow to respond to price changes. Therefore, this study aims to determine the determinants of tobacco supply in Indonesia using the *Generalized Method of Moment* (GMM). This study uses secondary data in the form of time series data from 2000-2019. The results show that the supply of tobacco is elastic to the domestic tobacco price but inelastic to changes in the export price of tobacco and the supply of tobacco in Indonesia is influenced by land area, and rainfall. This shows that efforts to expand the planting area or extensification are effective efforts to increase production.

Keywords: *Tobacco Production, Tobacco Prices, Tobacco Consumption*

Fomo: Brand Experience And Loyalty Of Authentic Madura Food Products

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Abstract

This research is a study to produce recommendations strategies for survival and development of home industries to face Fear of Missing Out (FoMO) phenomeon, which comes from the low satisfaction of mood and life needs consumers in real life. However, Fomo has a very strong influence on sales because it can make potential consumers to purchases quickly so they dont run out and miss the trend. Using qualitative descriptive analysis and literature study, to identify the lifestyle behavior of FoMO consumers and their relation of brand experience on local Madura food products which are identical with their characteristics and uniqueness.

Key words: *fomo, brand, loyalty, consumers, madura*

Protein Content Affected Sensorial Properties of Cooked Rice Samples from The Merauke Regency

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Abstract

Rice is not the native staple food for the local Merauke population. However, the Merauke Regency is potential for rice cultivation since the field is mainly flat, swamp, and fertile. It was firstly introduced by the Netherlands. Since then, rice has slowly taking part in the local diet. Rice cultivation in the Merauke Regency showed high productivity and thus it could fulfill the local demand and was also distributed to the neighbouring regencies. In 2019, local farmers cultivated 11 rice varieties in the Semangga, Tanah Miring, and Malind districts. A postharvest research was performed to check the quality and the consumer acceptance of the rice harvest. As a comparison, samples harvested from Cilamaya (West Java Province) were taken. The physicochemical assessment covered moisture content, head rice recovery, length, whiteness, apparent amylose content, and protein content. The sensorial assessment was performed on cooked rice and the result was correlated to the physicochemical properties of rice through Partial Least Square (PLS) analysis. Most (14 out of 19) cooked rice samples from Merauke obtained the same scores during the sensorial assessment. All samples from the Malind district displayed identical sensorial scores, except for the Pandan Wangi with a lower aroma score which was possibly due to its relatively high protein content (6.45%). Meanwhile, a relatively high protein content (7.92%) was most likely the driver for the cooked Membramo rice in the Semangga district in obtaining higher scores in both shine and general acceptance. The cooked Inpari 42 rice from Cilamaya which scored higher for colour also displayed a relatively high protein content (11.12%). These results indicated that protein content played a great role in determining the sensorial properties of cooked rice samples from Merauke.

Key words: *rice quality, consumer acceptance, aroma, PLS*

The Potential of Nglanggeran Village, Gunungkidul, Yogyakarta, Indonesia as a Farmer Corporation-Based Agricultural Area

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Abstract

Five hamlets in Nglanggeran Village, Gunungkidul, Yogyakarta are known to have potential for cocoa and goats. Identification of potential resources is one of the success factors for establishing a farmer corporation in an agricultural area. The research objectives were 1) to identify potential resources (cocoa and goat's milk), 2) to identify the application of Good Handling Practices (GHP) in resource processing (cocoa and goat's milk), and 3) to identify the carrying capacity of resource processing facilities (cocoa and goat's milk). goat's milk) in Nglanggeran Village. The research method used was quantitative descriptive analysis to identify the potential and application of GHP in resource processing (cocoa and goat's milk) and scalogram analysis to identify the carrying capacity of the processing facilities. Quantitative descriptive analysis showed that the highest potential of cocoa and the best application of GHP came from Hamlet of Nglanggeran Kulon (±1435 kg/month wet cocoa beans), while the highest potency of goat's milk and the best application of GHP was obtained from Hamlet of Nglanggeran Wetan (have 57% of she-goats ready for milking). The scalogram analysis shows that the availability of processing facilities in Nglanggeran Kulon Hamlet is categorized I (good) in maintaining cocoa resource potential, while Nglanggeran Wetan Hamlet is categorized I (good) in maintaining goat livestock resource potential. The potential of resources, the application of GHP, and the availability of processing facilities in Nglanggeran Kulon and Nglanggeran Wetan Hamlets strongly support the development of cocoa and goat farming centers based on farmer corporations in the Nglanggeran Village area.

Key words: *potency, good handling practices, facility, cacao, and dairy goat*

Income and Welfare of Liberica Coffee Farmers in West Tanjung Jabung Regency Jambi Province

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Abstract

The purposes of this research were to analyze the level of household income and the welfare of liberica coffee farmers in Betara District, West Tanjung Jabung Regency. This research location was chosen purposively in Betara District, West Tanjung Jabung Regency. The research was conducted by survey method. Data collection was carried out in Agustus until September 2021. The sample size was 60 coffee farmers who were drawn by simple random sampling technique. The analysis used analysis of farm income and household welfare according to Sayogyo criteria. The results of this study indicate that the average household income of coffee farmers in Betara District, West Tanjung Jabung Regency were relatively high and the welfare of coffee farmer households based on Sayogyo criteria were categorize as prosperous.

Key words: *coffee, income, prosperity.*

Morphology and Genetic Diversity of *Fusarium* spp. Causes of Shallot Basal Plate Rot Diseases from Lowlands and Highlands of North Sumatra

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Abstract

Shallot basal plate rot disease (moler) caused by *Fusarium* spp. is one of the main diseases that caused low productivity of shallots in North Sumatra. The results of identification of *Fusarium* species diversity morphologically were often inaccurate so that differences between closely related species were difficult to observe because Fusarium has a very high genetic variation. This study aimed to analyze the diversity of morphology, genetics, and kinship of the fungus *Fusarium* spp. originating from the highlands and lowlands of North Sumatra. *Fusarium* spp. isolated from infected shallot plants from 6 districts/cities in North Sumatra. The morphological diversity of Fusarium spp. analyzed based on colony growth rate, colony color, conidium density, shape and size of macroconidia, microconidia, and chlamydospores. Genetic diversity was analyzed using the *Polymerase Chain Reaction* (PCR) technique, universal primers ITS1/ITS4, sequencing, and kinship relationships were analyzed based on the phylogeny tree. The results of this study showed that from 9 isolates of *Fusarium* spp. originating from the lowlands and highlands of North Sumatra had diverse morphological characters. Genetic analysis identified that 7 isolates of *F. solani* and 2 isolates were *F.oxysporum*. Based on the analysis of kinship relations, *F. solani* from Medan city, Batubara district, Serdang Bedagai, Simalungun, Samosir, Dairi were grouped into one group and *F.oxysporum* from Medan city and Simalungun district were also grouped into one group because they had closed kinship relationships.

Key words: *Fusarium spp., morphological, genetic, kinship analysismaximum five words, were strongly reflected the manuscript*

Evaluation of Maize-Soybean Intercropping on Specific Dry Land in Gunungkidul - Yogyakarta

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Abstract

Evaluation of the value competition and yield advantages of maize soybean intercropping in dry land is still limited. The aim of the study was to determine the competitive value and yield of maize soybean intercropping on dry land through the right combination of plant varieties. The study was conducted at Trengguno kidul, Sidorejo, Ponjong, Gunungkidul from March to August 2020. The study was random block design with 5 repetitions, 3 maize varieties (Srikandi Ungu, Pulut Uri 1, Nasa 29), and 2 soybeans varieties (Dega 1 and Biosoy 2), so there are 6 intercropping combinations, and monoculture planting as a comparison. Agronomic observations and data collection were carried out until harvest with observation of Land Aquvalent Ratio, Competitive Ratio, Relative Crowding Coefficient, Aggresivity, and Actual Yield Loss. The results showed that the intercropping of maize and soybeans in the dry land of Gunungkidul was very profitable. Maize are more aggressive and competitive than soybeans so that they contribute profits to the Land Aquivalent Ratio, Competitive Ratio, Aggresivity, and Actual Yield Loss. The intercropping of Srikandi ungu maize and Biosoy 2 of soybeans yielded the highest of total Land Equivalent Ratio and total of Actual Yield Loss were 2.89 and 2.80 respectively.

Keywords: *evaluation, intercropping, dry land, maize, soybean, Gunungkidul*

Non-preference for oviposition and damage intensity on soybean genotypes by *Bemisia tabaci*

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Abstract

Bemisia tabaci is one of the economically important pests of many cultivated plant. This pest also plays as a virus vector that causes high yield losses. The objective of this study was to determine non-preference for oviposition in soybean genotypes to *B. tabaci* and the damage intensity caused by this pest. The experiment was conducted in Indonesian Legumes and Tuber Crops Research Institute in 2018. 11 soybean genotypes were evaluated in screen house using randomized block design with three replicates in which infested naturally by *B. tabaci*. The result showed that the population of egg and adult *B. tabaci* was not significantly different between genotypes. However, the population of nimph and leaf disease intensity was significantly affected by genotypes. The average number of nymph was 44.4 individuals/pot with the highest population of was found on G1000H/9305//IAC100-271///Grob-36-2 and the lowest was found on Kaba/IAC100//Brg63///Grob-392-1. Moreover, the leaf damaged intensity ranged from 8.6-33.4%/pot (average of 24.6%/pot). Based on oviposition preference indicated by nymph population, and leaf damaged intensity, there were two promising lines (Kaba/IAC100//Brg63///Grob-386-1 and Kaba/IAC100//Brg63///Grob-392-1) showed consistently moderately resistant against *B. tabaci*. Both have same response with G100H. Therefor, these two soybean promising lines were considered to be released as superior variety and further could be potential as gene source for improving the resistance against *B. tabaci*.

Keywords: *B. tabaci; damage intensity; non-preference; resistance mechanism.*

Comparative Analysis of Indonesian Cocoa Competitiveness in the International Market

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Abstract

Cocoa is one of Indonesia's leading export agricultural commodities. The cocoa market has great potential as seen from the increase in world consumption, so that Indonesia is expected to take advantage of the existing opportunities. Therefore, the level of competitiveness of Indonesian cocoa compared to other producing countries, to analyze its performance in the International market. This study applies the Revealed Comparative Advantage (RCA) and the Trade Specialization Index (TSI). This study uses data for the period of 2010 – 2019 from five cocoa producing countries (Ivory Coast, Ghana, Indonesia, Nigeria, and Cameroon). The results show that Indonesia has a comparative advantage as an exporter of cocoa beans in the International market. Judging from the Revealed Comparative Advantage (RCA) index value of Indonesian cocoa, from 2010 to 2019 every year it was above the value of 1, meaning that Indonesia's competitiveness for cocoa was above the world average. From the value of the Trade Specialization Index (ISP) for Indonesian cocoa, the average is close to 1, it indicates that Indonesia has reached the stage of export maturity.

Key words: *Cocoa, Comparative Advantage, Competitiveness, ISP, RCA*

The Omni-channel Marketing Strategy and Customer Path in Fast Food Industries: A Comparison Study

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Abstract

Today organizations around the world and of all types are making use of ICT. In this digital era, the concept of marketing strategy 4.0 needs to be carried out and improved so that businesses or companies can truly connect with consumers. Companies or Small Medium Enterprises (SMEs) that have a millennial generation segment and are aggressively marketing in Indonesia are the fast-food industry. This research purpose is to identify and find out the difference between omni-channel strategy and 5A connectivity used by Small Medium Enterprises (Hisana) and multinational companies (McDonald's). This research used a quantitative approach, conducted from March to April 2021. For sample determination technique used is multistage random sampling by framing from sub-district until neighborhood level (RT). A respondent that used in this research is 270 respondents that were born in 1980-1999. For analysis data, first did the descriptive analysis, to omni-channel and customer path both restaurants. Second, calculate PAR and BAR and then define the industrial patterns. The results show that the connectivity patterns formed can be seen from the most important touchpoints and the most favorite customer path scenarios. Those PAR and BAR results showed that the value is close to 1, which means that the marketing that has been done by both restaurants can successfully convert aware consumers into acts and advocates. That industrial pattern has the same pattern, it is the doorknob. The results of the omni-channel strategy are both restaurants used online and offline media in marketing activities. Consumers get and looked for information through online media such as social media as well as from offline media such as brochures, banners, or from restaurants directly.

Key words: *Customer Path, Omni-channel, Industry Pattern, and Fast-food Industry*

Improving Employee Productivity Through TQM Implementation: Case study in Cocoa Industry

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Abstract

In an intense competition situation, companies must have a great management system like total quality management (TQM) where is a technique that can maximize the company's competitiveness through consumers focus, employees involvement, and continuous improvement of quality, products, human services, processes, and organizational environment (Krajewski et al., 2013). The application of TQM in the company will also positively affect the productivity of company employees as the dominant resource in every company's activity, in both as planners, actors, and determinants of the realization of organizational goals. However, the application of TQM in each company showed different effects, and most of the previous research related to TQM has not yet focused on employee productivity. Thus, This study aims to describe and analyze the effect of TQM dimensions on employee productivity. This research was conducted at a cocoa agro-industry company in Bali from March to April 2021. Sampling was carried out using a total sampling method and collected through interviews, questionnaires, and literature studies, and then the data were analyzed using structural equation modeling with partial least square (SEM-PLS). Result shows that the TQM dimension has a positive and significant effect on employee productivity, and it can increase employee productivity. It is recommended that companies implement TQM and continuously improve its implementation by implementing regular training and coordination for evaluation and improvement. For future studies, it is better to use a larger sample and focus it on one company division.

Key words: *Total Quality Management, Employee Productivity, Agroindustry, Structural Equation Modeling, SEM-PLS.*

Soil Liming In A Sub-Watershed By Using Exchangeable Aluminium And Effective Cation Exchange Capacity Methods

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Abstract

Agricultural liming is a central issue in tackles soil acidity problems in tropical soils. A study on liming in a 1.845,2 ha area of sub-watershed Kemuning, Jember using Exchangeable Alumunium (Al-dd) and Effective Cation Exchange Capacity (CEC) methods has been conducted. Our results showed that based on the Al-dd method, the average need for lime is 0.26-3.2 tons/ha in calcite and 0.9-3.5 tons/ha in dolomite form. Furthermore, using the Effective CEC method the average need of lime is 1.2-3.2 tons/ha. Based on the Al-dd method there is an area of 336.4 ha that requires calcite of 470.9 tons, while using the effective CEC method there is a 676.2 ha area that takes calcite of 946.7 tons. There are differences in the location and amount of lime required in the two calculation methods.

Keywords: *effective CEC, exchangeable Aluminium, Liming, Soil Acidity*

Limiting Factors and Balance of NPK Nutrients in Rice Paddy Farming System and Corn Crop Dry Land

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Abstract

Fertilizers that contain N, P, K nutrients have become a necessity in the cultivation of plants both in rice fields and on dry land. Most of these fertilizers are based on plant commodities and are less based on the diversity nature of the soil or planting media. The purpose of this study is to establish nutrients that are the limiting factor and balance of NPK nutrients in the rice paddy farming system and dryland of corn crops. The research was conducted in rice fields with rice crops in Jember regency and dry land in Bogor regency with corn crops. The fertilizer used is organic fertilizer. The nutrient balance is obtained through the calculation of the difference between the total nutrient inputs N, P, K given with the total output of nutrients N, P, K transported by the plant. The results showed that giving fertilizers up to 10 tons/ha can increase crop production and nutrient balance patterns are negative for nitrogen, while positive for phosphorus and potassium. The other than that soil organic matter content in low to very low status.

Key words: *Limiting factor, NPK balance, paddy soil, dry land*

Compost tea as biofungicides to suppress *Sclerotium rolfsii* on soybean (*Glycine max* L. Merr.)

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Abstract

One of the important diseases that can reduce the productivity of soybean is damping-off disease caused by *Sclerotium rolfsii*. This disease can be controlled by using synthetic pesticides. However, excessive use of pesticides can cause pollution to the environment and the resistance of the pathogen to pesticides. This study aims to determine the effect of compost tea of worm dropping in suppressing the fungus *Sclerotium rolfsii,* the causal agent of damping-off disease of soybeans (*Glycine max* L. Merr). This research was carried out in a glasshouse and Microbiology Laboratory, Faculty of Agriculture, The University of Mataram. The experiments were arranged according to Completely Randomized Design (CRD), which consist of 2 types of compost tea, namely compost tea, which was produced through the aeration process (Aerated Compost Tea-ACT) and produced without aeration process (Non aerated Compost Tea-NCT). The experiment consisted of 7 treatments and replicated 3 times, namely; Control, ACT without dilution, ACT with 10^{-1} dilution, ACT with 10^{-2} dilution, NCT without dilution, NCT with 10^{-1} dilution, and NCT with 10^{-2} dilution. The results showed that in the in vitro experiments both types of compost tea could suppress the growth of the fungus S. *rolfsii*. In the in vivo experiment, the treatment of NCT 10^{-1} dilution and ACT 10^{-1} dilution were categorized as quite effective in reducing the incidence of damping-off disease with the effectiveness rates of 51.72% and 47.13%, respectively

Key words: *Sclerotium rolfsii, compost tea, biofungicides, soybean*

Optimiation of Encapsulation Process of Karamunting Fruit (Rhodomyrtus Tomentosa, (w.ait), Myrtaceae) Powder from Tarakan Island as Antioxidant Sources

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Abstract

Karamunting (*Rhodomyrtus tumentosa* W.Ait Myrtaceae) is one of weed that is widely found in Kalimantan, which contains bioactive compounds and nutrients that are beneficial in the health sector. The study aimed to determine maltodextrin concentration, tween 80, and the optimum drying temperature in the encapsulation process that does not damage the bioactive compounds of karamunting fruit powder and to analyze the feasibility of producing karamunting fruit powder as antioxidant sources viewed from financial perspective.

This study employs the Response Surface Method with three-factor namely X1/maltodextrin concentration (5, 10, 15%), X2 /tween 80 concentration (0.1, 0.2, 03%) and X3 /temperature of encapsulation (50, 55, 60 ºC). Research parameters included antioxidant activity, vitamin C, dietary fiber,and financial perspective (production costs, HPP, BEP, NVP, and IRR). The results of the optimization of foam mat drying conditions in protecting the bioactive compounds of karamunting fruit powder were tween concentrations of 0.3%, maltodextrin up to 14,41 %, and the temperature was 58,425 ºC. Under this condition, it can produce a total phenol antioxidant activity (IC50) 11,182 µg / ml, vitamin C is 14.8 mol vitamin C/gram dry weight, and dietary fiber content is 84.75%.

Based on the research results, it can be concluded that the business of karamunting fruit powder industry was feasible to run viewed from various aspects. This can be seen from the BEP score of Rp. 110.347.711,1 with the number of products 258.673,79 units, and the score of business efficiency (R / C) ratio of 1.5, NVP up to Rp. 497.616.870,05, - or > 1, so the effort was considered as feasible. This was also supported by the IRR value of 19,5%, the IRR value was higher than the interest rate set by the current government, so it can be said that the Karamunting fruit powder business is feasible to conduct.

Keywords: *antioxidants, encapsulation, financial feasibility, karamunting, optimization*

Viral Diseases of Sugarcane in Indonesia and Their Management Strategy

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Abstract

Virus is one of the sugarcane plant pathogens that have a potential to reduce sugarcane and sugar yields. Several viral diseases have been reported in sugarcane plantations in Indonesia and some of them cause a significantly impact on sugarcane/sugar production. The major viral disease of sugarcane in Indonesia is mosaic disease. There are two types of viruses that cause mosaic disease, namely *Sugarcane Mosaic Virus* (SCMV) and *Sugarcane Streak Mosaic Virus* (SCSMV). The outbreak of SCMV occurred in the 1970s, while the outbreak of SCSMV happened in 2005. Other existing viruses that have been reported are Sugarcane Yellow Leaf Virus (SCYLV) in some commercial sugarcane, *Sugarcane Bacilliform Virus* (SCBV) in germplasm collection, and *Fiji Disease Virus* (FDV) in wild sugarcane. The transmission of viral diseases is mainly through diseased cane cuttings. Sugarcane growers generally pay less attention to the health of seed canes so that the viral diseases can spread easily and quickly. The main strategy for controlling viral diseases is through planting resistant varieties and using virus-free planting materials. This paper reviews viral diseases of sugarcane in Indonesia including records of occurrences, bioecology and control strategies as well as presents information on exotic viral diseases that have a potential to threaten Indonesia's sugarcane plantations.

Keywords: *Sugarcane, Viral Disease, Bioecology, Plant Disease Management*

Analysis of Income the Rice (*Oryza sativa* L.) Farm in the Village Tani Aman District Loa Janan Ilir in Samarinda (Case Study : The Subur Aman Farmers Group)

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Abstract

Revenue is a subtraction of total revenues and costs. Farming income is the difference between gross income *(output)* and production costs *(input)* which is calculated in the growing season. Farming income analysis can be used to measure the success of farmers in farming lowland rice, where lowland rice is a plant that requires sufficient water in its growth process. Therefore, this study was conducted to find out how much the production costs, revenues, income, and profit levels of lowland rice farming area in the Subur Aman Farmers Group, Tani Aman Village, Loa Janan Ilir District, Samarinda City. The study was conducted in the Subur Aman Farmers Group from March to Mei 2021. The data used in this study included primary data and secondary data. Sampling used the saturated sampling method or census with 32 respondents and the data analysis used was income analysis and R/C Ratio. The result of this research showed that the average production of one growing season was 5.577 kg GKG and the production cost was IDR302.879.475 mt^{-1} with an average of IDR9.464.984 mt^{-1} $respondent^{-1}$. Revenue is IDR1.070.700.000 mt^{-1} with an average of IDR33.459.375 mt^{-1} $respondent^{-1}$. Income of IDR767.820.525 mt^{-1} with an average of IDR23.994.391 mt^{-1} $respondent^{-1}$ and the result of the R/C Ratio is 3,40.

Keywords: *income, farming, rice farm*

The Induction of Somatic Embryogenesis in Cassava (Manihot esculenta Crantz)

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Abstract

Cassava (*Manihot esculenta* Crantz.) is an important tropical tuber crop, which is utilized as food, feed and raw material for industrial uses. Cassava is a major staple food crop cultivated in several developing countries. Somatic Embryogenesis (SE) is the process while the somatic cells (wether haploid and diploid) grow to form a new plant by specific embryo development step without a gametes fusion. The purpose of this study was to determine the combination of TDZ and BAP on the induction of somatic embryogenesis. Sterilization was carried out in 2 stages, firstly it was washing with detergent and was rinsing with running tab water, then sprayed with 70% alcohol. Furthermore, the sterilization was carried out in the LAF by shaking with 70% alcohol for 5 seconds then rinsing with sterile distilled water 2 times. The next step it was shaking with 20% commercial chlorox for 3 minutes and was rinsing with sterile distilled water 2 times. MS medium supplemented with different concentrations of TDZ (0, 0.5 and 1.0) mg L^{-1} and and BAP (0, 1, 2 and 3) mg L^{-1} . The result of this research shows that the best induction treatment is on B0T1 (BAP 0 mg/l, TDZ 0.5 mg/l) and B0T2 (BAP 0 mg/l, TDZ 1 mg/l). On the proliferase phase, the suitable medium is BAP 1 mg/l, TDZ 0,5 mg/l and CuSO4 0,319 mg/l, but on cotyledon and regeneration phase, the callus unable to grow perfectly and the callus only grow as a globulat until the cell elongation.

Key words: *Cassava, TDZ, BAP, Somatic Embryogenesis (SE)*

High Yield Potential of Fifteen Soybean Accessions with Different Planting Methods

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Soybean genetic resources with high yield potential and supported by good crop management are expected to increase soybean productivity. In Indonesia until 2021 there are 105 soybean varieties that have been released by Indonesian Ministry of Agriculture with potential yields 1.0-3.8 t/ha. A study has been conducted to obtain high yield soybean genetic resources and different planting methods so that it can improve growth and increase productivity to achieve yield > 3.0 t/ha. The research was conducted at 2018 in Kendalpayak research station, Malang, East Java. The experimental design was split-plot with three replications; where the main plot was planting methods (double row and single row) and the sub plot was soybean genotype (15 genotypes of ILETRI collection). Plant growth, light intensity, seed yield and yield components were measured to determine the effect of treatment. Results showed that there was variability of response each genotype to different planting methods. Based on the productivity per hectare there are 9 accessions no. : 2, 3, 5, 6, 8, 9, 11, 13, and 15 which has the opportunity to produce soybean productivity above 3 tonnes / ha used two methods of planting. Used of double row spacing (50 cm x (30 cm x 15 cm) increased soybean productivity by 11% compared to single spacing (40 cm x 15 cm)

Keywords: *Soybean. Germplasm, methods of planting, soybean, yield*

Pest Attack on Five Varieties Sorghum in Coastal Area Bengkulu

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Abstract

Sorghum bicolor L. Moench (Poaceae), is a high value crop cultivated throughout the world. Sorghum has important potential as a source of carbohydrates for food, feed and export commodities. The development of sorghum plants in Indonesia continues to be pursued to meet the increasing needs. One of the obstacles in its development efforts is the attack of plant pest organisms, damage caused by insect pests at various stages of plant development can reduce productivity. The purpose of this study was to evaluate the attack of plant pests on five varieties of sorghum (Super 1, Super 2, Suri, Ketan and Numbu) in the coastal area of Bengkulu. This research was conducted in Kandang Mas, Kampung Melayu, Bengkulu city (31.4 m) above sea level. Observations of pest attacks include types of pests and symptoms of attack. The results showed that the insect pests found on sorghum were *Spodopera frugiperda, Peregrinus maidis, Rhopalosiphum maidis, Valanga nigricornis, Ostrinia furnacalis, Helicoperva armigera, Sitophilus* sp. Pest attacks on the five varieties were different, the Numbu variety was resistant to *Spodopera frugiperda*, but susceptible to *Ostrinia furnacalis*, the Ketan variety was resistant to *Valanga nigricornis* and the susceptible variety to *Helicoperva armigera* was Suri.

Keywords: *Pests, identification, varieties, sorghum.*

Morphologycal Performance Of Rambutan (*Nephelium Lappaceum* L.) For the Uses of Biodiesel

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Abstract

Rambutan seeds contain relatively high fatty acids ranging from 17-39% which can be used as biodiesel additives. The efforts made to uilize rambutan seeds by carrying out plant breeding and cultivating plants based on morphological characters as the basis for rambutan genetic information. This study aims to determine the diversity and grouping between varieties in order to obtain important morphological markers so that genetic diversity can be used as biodiesel material. Benefit of this research can provide information about the grouping of rambutan morphological characters easily. The research was carried out September-October 2020 at Balai Tanaman Pangan dan Hortikultura (B2TPH) located in Pendem Village and Colomadu, Karanganyar Regency. Using direct survey and descriptive methods. Data obtained by dendogram analysis to assess the similarity between collections. The result of the research on rambutan morphology were divided into two groups, the first consisted of two subgroups, the first subgroup was binjai which was closely related to sibatuk ganal, and the second subgroup was rapiah whisch was identical to analagi, the second group was lebak bulus. Dendogram result of fruit and seed morphology were divided into two groups, the first group consisted of two subgroups. Sumbgroup one namely binjai and sibatuk ganal while the second subgroup was lebak bulus. The second group consisted of two varieties, namely rapiah and antalagi.

Key words: *morphology, varieties, rambutan*

Propagation of stem cuttings of some ornamental plants at various Rootone-F concentrations

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Abstract

The demand for ornamental plant commodities is increasing, so it is necessary to select propagation techniques that are in accordance with the type of plant. This study aims to find out the best plant stem cuttings and the best Rootone-F concentration on each of these stem cuttings. This research uses Nested Design with a Complete Random Design pattern. The first factor consists of 3 types of ornamental cuttings namely jasmine (*Jasminum sambac* L.), rose (*Rosa sp*.), and cananga (*Canangium odoratum* Baill) while the second factor consists of 6 concentrations of rootone-F which are 0,200, 400, 600, 800, 1000 ppm. The results showed that the type of plant cuttings that are best for growth and development are rose cuttings. The best concentration of Rootone-F in each type of plant stem cutting in the study was at the 400 ppm, although on some parameters it was not different significantly with 200 ppm and 600 ppm.

Key words: *jasmine, rose, cananga, plant regulator*

Analysis of Chili Demand in Indonesia

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Abstract

The increase in population that continues to increase every year and the growth in the national economy has resulted in an increase in demand for commodities, both from households, industrial and food processing, as well as export needs. The attention paid to chili products is also influenced by the price in the market. When chili production is abundant, the price of chili will be very low and demand will increase, otherwise when chili production decreases, the price of chili will be high and demand will decrease. Therefore, the purpose of this study is to analyze the factors that influence the demand for Indonesian chilies, determine the most dominant factors affecting the demand for Indonesian chilies and determine the demand for red chilies in Indonesia. The data used in this study is data from 2005 to 2019. The analytical method used is multiple linear regression analysis. The results showed that the independent variables that had a significant effect on the demand for Indonesian chili were income per capita, the price of garlic and the export price of chili. The most influential independent variable on chili demand is per capita income. Price elasticity of 0.134 indicates that red chili is inelastic. Shallots and garlic are complementary goods with elasticities of -0.285 and -0.060. The elasticity of income per capita is 3,115 which indicates that the percentage of red chili demand will increase if income increases.

Keywords: *red chili, consumption, elasticity, demand*

Gazebo Semar: An Android-based Farmer Education Platform for Agricultural Waste Management

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Abstract

Agricultural waste is an environmental problem in Karanganyar District. The knowledge level of farmers is still low about waste management, thus, it causes they could not handle waste properly. Farmers in Karanganyar only handle agricultural waste such as rice straw, husks, and corn stalks by burning them. This activity causes environmental problems due to air pollution. Therefore, this study attempts to create an innovation providing education for farmers on properly treating agricultural waste. The Gazebo Semar android application is developed as a solution to deal with this problem. The Gazebo Semar application can be accessed easily via a smartphone. This application contains various kinds of information about agricultural waste, such as the destructive impact of agricultural waste, how to distinguish waste that can be processed, and guidelines for processing agricultural waste into organic fertilizer. The expected result of this innovation is that farmers can treat agricultural waste properly without causing environmental pollution. By using this innovation, farmers can process agricultural waste into organic fertilizer that is economically profitable.

Key words: *agricultural waste, android application, innovation, organic fertilizer*

Characterization of porang (*Amorphophallus muelleri*) endophytic bacteria

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Abstract

The objective of this study was to obtain endophytic bacteria isolates from porang and determine their molecular characterization. The bacteria were isolated from the root and bacteria colonies grew around the root of porang plantlets using Nutrient Agar. The isolates were tested for hypersensitive and haemolytic reactions. Characterizations were conducted on morphology, physiology, and biochemistry. Physiological and biochemical characterization included cellulase, protease, chitinase enzyme activity tests, IAA-like compounds excretion detection, and Anti Quorum Sensing (AQS) bioassay. Twenty-two bacteria isolates were isolated from porang roots and 8 isolates from porang tissue culture. All isolates did not cause a hypersensitive reaction on tobacco leaves, but only 9 of the isolates were non-haemolytic. Among the non-haemolytic isolates, 4 isolates produce cellulase, 3 isolates produce proteases. The isolates did not detect chitinolytic activities. Three isolates were able to excrete IAA-like compounds. The AQS bioassay showed that 3 isolates had the ability to degrade acyl homoserine lactone (AHL). Analysis of 16S rRNA sequence showed 5 of the isolates belongs to *Bacillus*, 2 belong to *Acinetobacter*, and 2 others are still unidentified. Based on the characters (cellulolytic, proteolytic, AQS), *Acinetobacter radioresistance* EAP 10 is the most potential isolate to be developed as a biological control agent.

Key words: *Amorphophallus muelleri, endophytic bacteria*

Impact Of Virgin Coconut Oil (VCO) On Probiotic *Lactobacillus delbrueckii subsp. bulgaricus*

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Abstract

VCO is a functional food that is often consumed as an alternative in improving health. In the body there are probiotic bacteria which are normal microflora of the intestine, an example of probiotic bacteria is *L. bulgaricus*. This research was conducted to see the effect of VCO on the activity of *L. bulgaricus* probiotic bacteria in the body. The growth (viability) test of *L. bulgaricus* was carried out by counting the colonies used a total plate count method. Diffusion method was used to determine the antibacterial activity of *L. bulgaricus* metabolites. MIC determination used the dilution method (microdilution). VCO was made using the fishing method and has met the standards for specific gravity (0.9149), refractive index (1.4546) and water content (0%). The fatty acid component was tested using GCMS with the highest concentration, namely lauric acid (17.92%). The VCO concentration used in the bacterial growth (viability) test was 1%, 5%, 10%, 15%. The best concentration of bacteria was at concentration of 1%. There was a significant difference in the number of probiotic bacteria in the concentration of 15% with negative and positive controls. The number of bacteria at the four concentrations were 150.8 x 10^{12}, 111.4 x 10^{12}, 109.25 x 10^{12}, 55.667 x 10^{12}, respectively. Antibacterial activity tested of *L. bulgaricus* metabolites with three concentrations (100%, 75%, 25 %) resulted in the resistance response obtained, namely weak-moderate. In the antibacterial activity test on *L. bulgaricus* metabolites that were not treated with VCO produced a significant difference. Testing the Minimum Inhibitory Concentration (MIC) on *L. bulgaricus* metabolites that had been treated with VCO and not treated resulted in different MIC. The MIC on untreated metabolites was 4.69%, while the MIC on treated metabolites was 9.38%.

Keywords: *VCO,, Lactobacillus bulgaricus, viability, antibacterial activity, Minimum Inhibitory Concentration.*

Identification of *Simplicillium lanosoniveum* At Suppresive Soil Potential Areas In Brantas Watershed - Indonesia

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Abstract

Simplicillium lanosoniveum strain CG888 (MT 081944.1) is one of the fungi was isolated from the results of rhizosphere soil exploration in Gondang Manis guava, Perak District, Jombang Regency, Indonesia, which is included in the Brantas watershed area. Sampling was conducted in July 2020, using a one diagonal sampling method with five sample points. Purification of fungal isolates from soil samples was carried out using the dilution method, up to level of 10^{-2}. The DNA extraction results were amplified using the PCR technique. ITS4 and ITS5 primers were used for the amplification of the ITS rDNA region. The sequencing results were analyzed based on GenBank data at the National Center for Biotechnology International (NCBI). using the Basic Local Alignment Tools (BLAST) program. The phylogenic structure was determined using MEGA 7.0 software. Based on macroscopic, it has white colonies on the upper surface, and the lower is yellowish. Yellowish color is found in the old colonies or in the center of the colony, and the growth to form a sphere. The texture like cotton with thick mycelia arrangement. Microscopically, The hyphae has transparent and septate, branching, tapering to the tip, and at the end formed phialid. The conidia are transparent, small and round in shape. *Simplicillium lanosoniveum* strain CG888 (MT 081944.1) as one of the antagonist fungi among other fungi that have been found and identified, so that it can support soil in the Brantas watershed area has the potential as a suppressive soil.

Key words: *Brantas watershed, Simplicillium lanosoniveum, suppressive soil*

The Supporting Factor of Developing Organic Fertilizer in Banyuwangi Regency

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Abstract

The aim of this research is to identify supporting factor to develop the use of organic fertilizer. This research conducted on April until June in Banyuwangi Regency involve Glagah, Licin, Kalipuro, Rogojampi, and Blimbingsari districts. The population of this research is 5 farmers groups which consist of 50 people. SWOT analysis is used in this research to get supporting factor develops the use of organic fertilizer. SWOT analysis involve internal and external factor. Internal factor (strength) organic fertilizer has impact on the body with 1,37 score. Internal factor (weakness) pest complaint with the score 0,280. External factor (opportunity) full support from Departement of Agriculture 1,70. External factor (threat) there is government subsidized product beside organic fertilizer 0,46 score.

Keywords : *Banyuwangi, Organic Fertilizer, Supporting Factor, SWOT Analysis.*

Evaluation Of Three Volatil Compounds Of Peanut Leaves Infected By Whitefly

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Abstract

The volatile compound is synthetic compound that was produced by plants induced by biotic and abiotic stress. Evaluation of three volatile compounds was done on peanut leaves infected by whitefly *Bemisia tabaci* Genn. The volatile compounds were tannin, phenol, and flavonoid. Tetrafoliat leaf in lines 3 to4 were used as sample-. Analysis was done in central laboratory of ILETRI (Indonesian Legumes and Tuber Crops Research Institute) used a spectrometer. The result showed that tannin contenton ten peanut genotypes was increased after the whitefly attack. Phenol content showed significant differences between genotype with mean value 154.54. There was no correlation between tannin and phenol compound with the whitefly population, however, path analysis showed that tannin had a direct effect on nymph age with a value 0.608. On the other hand, tannin had negative correlation with nymph age (r = -0.69). Flavonoid content was linier with whitefly population which landed on peanut leaves.

Keywords : *volatile compound, whitefly*

Morphological Characterization of Leaf and Tuber on High Sugar Content Sweetpotato Promising Clones

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Abstract

Evaluation of morphological characteristics of sweet potato clones of high sugar content is the stage before releasing new high yielding varieties of sweet potato. A total of 12 clones of sweet potato with high sugar content were observed for morphological characters of leaves and tubers based on their characteristics. The research was conducted at the Research Installation in 2020. The study was arranged based on a randomized block design with three replications. The clones were planted on beds measuring 1 x 5 m with a spacing of 20 cms. Observations included plant type, leaf and tuber characteristics. The results showed the diversity of plant types and leaf characteristics. While the characteristics of the tubers of the 12 sweet potato clones did not show any diversity.

Key words : *plant characteristic, leaf, tuber, sweet potato.*

Drying Characteristic of Blanched Asam Mangga Using Food Dehydrator

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Abstract

Asam mangga is a product of dried unripe mango, one of the traditional spices of South Sulawesi, which has a sour taste and distinctive aroma. Research on asam mangga as a local spice is relatively limited, especially regarding the hot water blanching as a pre-treatment and drying characteristics using a drying machine. This study aimed to analyze the drying characteristics of blanched asam mangga using a food dehydrator. Unripe mango with a harvest time of 65 days was sliced into 3 mm thickness and blanched for 1 minute at 90°C. The mango slices were spread on a tray using the thin layer method and dried in food dehydrator at 40, 50, and 60°C until it reached the equilibrium moisture content. Drying characteristics were analyzed and evaluated with thin layer drying mathematical models. The results showed that the most appropriate mathematical model to describe the drying characteristics of blanched asam mangga with various temperature was the Abbasi et al model. The value of effective moisture diffusivity varied from 7.53×10^{-10} to 1.53×10^{-9} m^2/s.

Key words: *asam mangga, food dehydrator, drying kinetics, Mangifera indica, pre-treatment*

Organizational Culture to Improve Agricultural Extension Performance

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Abstract

The improvment on the quality of government management can not be separated from the quality of human resources in the company. Based on the vision and mission of Bondowoso Regency, namely Economically Independent, Sustainable, Prosperous, Fair and Leading, within the framework of Faith and Piety which has strategic meaning and reflects the ideals, hopes that the Bondowoso community wants to realize. So that services in agriculture can be implemented according to standards as production of agricultural commodities. The purpose of this study was to determine the effect of organizational culture on improving the performance of extension in farming. The population in this study were agricultural extension workers in Bondowoso Regency with a total of 132 people. Methods of data collection using research methods population (N) or census. Data processing was carried out using IBM SPSS 26.0. The analysis used in this study is descriptive statistics and multiple regression Structural Equation Modeling (SEM). The conclusion of the study shows that organizational culture has a positive and significant effect on performance.

Key words: *Organizational Culture, Performance, Agricultural Instructors*

Diversity and species composition of weeds in rice cultivation, Tarakan Island

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Abstract

Weed management is through physical/mechanical, biological, and chemical control. In addition, the study of species composition is utilized for the control of weeds. The study was conducted to describe the diversity and composition of weeds in rice cultivation, Tarakan Island. The research was collected the Mamburungan, East Mamburungan, and Tanjung Pasir areas. Weeds were collected samples by the quadratic method with a size of 50 x 50 cm. There were 20 points/squared per location that took 3 (three) times. Weed composition has described the value of SDR (Sum Dominance Ratio), and the diversity was species richness index (R), Shanon-Wiener diversity index (H), evenness index (E), and similarity index. In total, 16 species of weeds were collected from sites. *Monochoria vaginalis* species had the highest SDR values in Mamburungan (32.7), and East Mamburungan (35.9), while species *Fimbristylis littoralis* in Tanjung Pasir (32.0). The diversity and evenness indeks were calculated in Mamburungan Timur (R=1.04, H'=1.34, E=0.61), Mamburungan (R=1.49; H'=1.64; E=0.64), and Tanjung Pasir (R=0.81; H'=1.36; E=0.70). The Mamburungan and Tanjung Pasir locations have the highest similarity index (70%). Then, the Mamburungan have the lowest index, which is 55%. The diversity and composition are influencing the strategic control of weed in rice cultivation in Tarakan Island.

Key words: *Diversity, Rice, Tarakan Island, Weed*

Abundance and Diversity of Predators in Rice Plantation with Combination Aplications of Botanical Insecticides and Endophytic Bacteria

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Abstract

Farmers face various challenges to obtain maximum yields. One of the biggest challenges for farmers is controlling insect pest populations. Usually farmers use agrochemicals to control pests, however, long-term and excessive use of agrochemicals will have a negative impact on the environment and farmers' health. This phenomenon can be prevented and handled by switching agrochemicals such as synthetic pesticides with botanical pesticides and biological agents. There is alot of information on the effectiveness of botanical insecticides and endophytic bacteria to control rice insect pests, it is also necessary to know whether these applications can reduce the abundance and diversity of rice pest predators. The research method used is calculation of the abundance and diversity of predators, calculation of the abundance and diversity of pests, observation of plant growth and production. The results showed that there were 8 genera of pests and 10 genera of predators on rice plants. Observation of the vegetative phase to reproductive phase in all treatments resulted in a diversity of small pests (H'<2). Observation of the vegetative to reproductive phases in all treatments resulted in moderate diversity of predators (2<H'≤3). While in the maturation phase, some treatments were found to have low diversity and some were still moderately diverse. There were 3 types of pests that were commonly found, namely *L. acuta*, *O. chinensis*, and *S. incertulas*. The most common types of predators were *P. fuscipes*, *Tetragnatha* sp., and *O. javanus*. In general, the combination treatment of botanical pesticides with endophytic bacteria can increase the growth of rice plants up to 20%.

Key words: *Botanical Insecticides, Endophytic Bacteria, Predators*

The Effect of Satisfaction and Competitive Advantage on The SMEs Sustainability of Local Coffee Shops: A Case in Yogyakarta, Indonesia

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Abstract

The SMEs business sustainability of the local coffee shop is extremely crucial in today's competitive market. Sustainability-oriented business practices, including local coffee shops, are obligated to maintain a high level of market competitiveness. Besides that, customer satisfaction also appears to be one of the pillars of long-term business viability. Yogyakarta province is one of the regions that has a great number of local coffee shops SMEs. This present study aimed to: (1) determine the level of competitive advantage of the local coffee shop SMEs, (2) measure the level of customer satisfaction of the local coffee shop SMEs, and (3) analyze the effect of competitive advantage and customer satisfaction on the sustainability of the local coffee shop SMEs in the Special Region of Yogyakarta. Yogyakarta city and Sleman district were selected as the research area. To collect the data, customers who uploaded pictures by using hashtags or tagging one of the 31 local coffee shop locations on their instagram account were asked to fill out an online questionnaire. Those customers had the same chance to be sampled according to a representative proportion at each local coffee shop. A total of 173 respondents from independent and franchise coffee shops were used as the samples in the study. Structural Equation Modeling (SEM) with the help of the AMOS application was utilized to analyze the data. The results of the research indicated that competitive advantage had a direct positive effect on the SMEs sustainability of the local coffee shops, while customer satisfaction did not affect it at all.

Key words: *local coffee shops, business sustainability, competitive advantage, customer satisfaction*

Organic System Practice of Oil Palm Pre-Nursery in Ultisol Media

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Abstract

Organic system practice is important to increase soil fertility, especially marginal ultisol. The using of organic agricultural system in pre-nursery palms use manure and organic liquid fertilizer that is known to provide micro and macro nutrients, also soil chemical character. This experiment aims to know the growth of the pre-nursery palms with additional combination betwen manure and organic liquid fertilizer in ultisol using organic agricultural system. The experiment did from June to July, 2021 at Beringin Raya, Bengkulu City. Experimental design having three factor treatments used split plot of randomized block design in 3 replications with 3 factors. Split Plot design consisted of two kinds that were shade as a main plot, and manure and organic liquid fertilizers as a sub-plot. The treatments were percentage shades (N1=50% and N2=75%), liquid organic fertilizer doses (B1= 0%, B2=5% and B3=10%), and various manures (P1=cow manure, P2=chicken manure, P3=goat manure and P4= non manure). Plant media was ultisol soil using 15cm x 23 cm polybag size. The measurements of this research were the growth of palm plant. Shade treatment of 50% and 75% percentages did not significantly effect to plant height. The result showed that was not interaction between the organic liquid and various manure fertilizers to growth on 4th, 6th, 8th, and 10th weeks in pre-nursery palm. Dose treatments of organic liquid fertilizer showed that the growth of palm in 10% doses was the best treatment, although did not effect. The kinds of manure treatments affected to the green leaves. The best manure treatment of the green leaves of palm plant in pre-nursery was goat and cow manures.

Key words: *Palm oil, prenursery, organic fertilizer*

Machine Learning and Thin layer Drying Model of Gembili (*Dioscorea sp.*)

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Abstract

This study was done to investigate the drying characteristic of gembili and the appropriate model to describe the characteristic drying of gembili (*Dioscorea sp.*). Gembili is a tuber that has been known to have the potential to be developed as an alternative food commodity. Gembili contains carbohydrates and various nutrients that are proven to be beneficial for health. The high moisture content of gembili is a problem that can be overcome by drying. In this study, gembili was dried at a temperature of 60-80 and the drying data was fitted using conventional thin layer models such as Newton, Page and Handerson & Pabis as well as machine learning models, namely neural network, and gradient boosting. The gembili drying process in general gets faster with increasing drying temperature and the drying process occurs in a falling rate period with effective diffusivity 1,6198E-12 - 3,2397E-12 m^2/s. All models, both conventional and machine learning models can be used to predict drying data well, with machine learning model surpass the conventional thin layer model. The neural network model showing the best results among the models used.

Key words: *gembili, thin layer model, machine learning*

Kinetics Reaction of the Flynn Wall Ozawa Method on Sawdust Pyrolysis using a Small Scale Pyrolysis Apparatus.

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Abstract

Sawdust waste biomass has a high heat potential to be used as a renewable energy resource. Pyrolysis is a technology for converting biomass into bio-char, bio-oil and bio-gas through the decomposition of biomass at high temperatures in the absence of oxygen. This study aims to find the optimum conditions for pyrolysis bio-oil production using small scale technology apparatus and determine the reaction kinetics parameters using the Flynn Wall Ozawa method. The small scale pyrolysis technology apparatus is designed using a furnace that can be adjusted to the fuel flow so that the pyrolysis heating rate can be controlled properly. Temperature variations carried out on sawdust pyrolysis with starting temperatures of 473 K, 498 K, 523 K, 548 K, 573 K, 598 K, 623 K, 648 K, 673 K, among others bio oil was obtained as much as 5.67%wt, 6.17%wt, 6.67%wt, 7.17%wt, 7.33%wt, 7.83%wt, 9.67%wt, 13.83%wt, 15.83%wt. The results of bio oil obtained at this temperature is brownish yellow, with an average mass is ± 48 g. T optimum for production bio oil is 673 K with kinetics parameter for bio oil are E=3587,85 kj/mol, A=3,73 minute^{-1} , bio gas E=3750,21 kj/mol, A=2,97 minute^{-1} ,and bio char E=6183,42 kj/mol, A=1,00 minute^{-1}.

Key words: *Pyrolysis, Flynn Wall Ozawa, Wood sawdust, Kinetics Reaction, Biomass*

Length of the Rainy Seasons and Its Effect on Food Crop Productivity

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Abstract

Food crop production is vulnerable to shifts in the annual rainy season. This study was conducted in Situbondo Regency from the year 2010 up to 2019. Rainfall data of the rainy (RS) and the dry season (DS) was analyzed for its correlation to food crop production in each sub-district. The results showed that of the 17 sub-districts studied, 11 sub-districts experienced a shift in the rainy season to be 0.08 - 4.45% longer and affected the productivity of rice, corn, and soybeans from an average of 6.17 tons/ha, 3.92 tons/ha, and 8.13 tons/ha to 5.74 tons/ha, 5.33 tons/ha, and 1.41 tons/ha, respectively. El-Nino significantly reduced rice productivity up to 6.33% in 14 sub-districts but did not affect the other three sub-districts.

Key words: *rainy season, food crops, El Nino, paddy field*

Physiological response of three large-seeded soybean genotypes under drought and puddle stress conditions

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Abstract

This study aims to determine the physiological response of large-seeded soybean genotypes on the effect of drought and puddle stress conditions. The method used in this study was an experimental method by conducting the experiment in the greenhouse of the Faculty of Agriculture, University of Mataram using polybags for drought and plastic buckets for puddle stresses. The experiment was carried out from April to November 2020, arranged with Split Plot design with four replicates and two factors, i.e. stress conditions (S_0 = normal, no stress, S_1 = drought stress, and S_2 = puddle (saturated water) stress) as the main plots, and soybean genotypes (G_1 = KH-1, G_2 = Argomulyo, and G_3 = Grobogan) as the subplots. Variables observed includes: root/shoot ratio, root length, number of nodules, nodule weight, proline content, leaf chlorophyll content (chlorophyll a, b, a/b ratio), relative water content, stomata behavior (stomata open, close, open/close ratio). Data were analyzed with analysis of variance (ANOVA) and LSD at 5% level of significance using CoStat for Windows. The results showed that: a) The physiological responses of the three large-seeded soybean genotypes were more influenced by stress factors than the genotype factors especially on proline and chlorophyll b contents, number of stomata opened and clossed, and root/shoot dry weight ratio. b) The highest proline content and the number of stomata clossed occured under drought stress, while the number of stomata opened, the stomata opened/clossed ratio, the chlorophyll b content of KH-1 and the ratio of root/shoot of Argomulyo were the highest under puddle stress condition.

Key Words: *soybean, physiological response, genotype, drought stress, puddle stress*

Agricultural Mechanization and Indonesian Rice Production in the Era of President SBY

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Abstract

Susilo Bambang Yudhoyono is the first President of Indonesia to be elected through the general election which during his reign Indonesia succeeded in achieving food security. At that timeIn order to achieve the goal to self-sufficiency, Indonesian government developed the agricultural mechanization for rice production. Thus, the rice farmers could increase rice productivity and efficiency; reduce post-harvest losses; and strengthen among small, medium, and large scale farming. This study aims to examine the impact of agricultural mechanization on rice production in main rice producer areas in Indonesia by using PATANAS data collected by the Indonesian Ministry of Agriculture under President SBY era. The PATANAS data used in this paper is 2007-2012 unbalanced panel data of rice production in the five provinces that were the main rice production areas in Indonesia. The result shows that agricultural mechanization is positively significant to the rice production at $\alpha = 1\%$. All regions use tractors to cultivate the land. Some areas, such as West Java, East Java, and South Sulawesi also use draft animal to cultivate the land. In North Sumatra, 90.7% of the farmers have been using the tractor. While in West Java, which is only 85.4% using the tractor and 5.2% still use draft animal to plow paddy fields. However, in Central Java, no respondents who use draft animal 92% claimed to use the tractor. East Java and South Sulawesi have similar results. In these areas, most farmers use tractors and several farmers use draft animal.

Key words: *mechanization, rice farming, PATANAS, tractor*

Increasing Yield of Waxy Maize Following Paddy Rice through Mycorrhiza-Biofertilization and Additive Intercropping with Several Rows of Peanut

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Abstract

Biofertilization with arbuscular mycorrhizal fungi (AMF) has been reported to increase yield of various crops. Waxy maize is one of specialty maize that tastes good but yield normally low especially in local cultivars. The objective of this study was to examine the effects of mycorrhiza-biofertilizer application and additive intercropping with several rows of peanut on yield performance of waxy maize of local Bima variety grown following paddy rice. The experiment was arranged with Split Plot design with three blocks and treatment factors, i.e. mycorrhiza-biofertilizer application as the main plots (M0= without, M1= with mycorrhiza-biofertilizer) and intercropping as the subplots (I0= monocropped maize, I1, I2, I3: relay-planting of 1, 2 or 3 rows of peanut between maize rows three weeks after seeding maize). The results indicated that application of mycorrhiza-biofertilizer resulted in significant effects on more observation variables than intercropping. However, there were significant interaction effects on plant height, green-leaf weight, dry stover weight, grain yield, harvest index, and proportion of grain to cob. In the plots with no application of mycorrhiza-biofertilizer, there were no differences in grain yield between defferent number of rows of peanut relay-planted between maize rows but when mycorrhiza biofertilizer was applied to the maize and peanut plants, relay-planting 2 rows of peanuts (I2) resulted in the highest maize grain yield (88.63 g/plant or 5.91 ton/ha), while the lowest maize grain yield (54.63 g/plant or 3.64 ton/ha) was in the monocropped maize with no mycorrhiza-biofertilizer (I0M0). The highest additional grain yield from peanut relay-planted between maize rows was in the I3M1 plot (708.5 g or 1174 grains per plot), followed with those in the I2M1 plot (539.8 g or 948 grains per plot). Therefore, there is a good prospect for peanut production by relay-planting it between rows of waxy-maize followed with application of mycorrhiza-biofertilizer.

Key words: *waxy maize, biofertilizer, mycorrhiza, intercropping, peanut*

Investigating physical and visual alterations of oven-dried cabya (*Piper retrofractum* Vahl.)

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Abstract

Cabya (*Piper retrofractum* Vahl.), often locally known as cabe jamu, can be a potential source for medicine and functional food industries. Regarding its perishability, there is a need to develop postharvest handling for preserving cabya quality as an alternative to conventional drying. Proper postharvest handling of cabya is essential since the quality deterioration occurs rapidly after harvested. This research aimed to investigate physical (dimension, weight loss) changes of cabya dried in the oven-drying at 80 °C for 2, 4, and 6 h. For visual appearance, digital image analysis using ImageJ software was applied to quantify color changes expressed as RGB. We compared RGB profile of fresh (FR), sun-dried (SD), and oven-dried (OD) cabya. In addition, their water activity was also measured. The results demonstrated that drying process caused substantial alterations of cabya between pre- and post-drying. In terms of dimension, the drying process for 6 h resulted in about 20% reduction compared with initial length and diameter of cabya. Meanwhile, the cabya weight was drastically altered by the process, reaching up to 58.26% weight loss following 6 h of oven-drying. Based on image analysis, mean intensity of RGB components in FR, SD and OD samples varied significantly, suggesting a variability of cabya color. Furthermore, water activity (aw) of these samples differed remarkably, i.e. 0.92, 0.75, and 0.56, respectively. This experiment highlighted remarkable alterations of dried cabya under oven-drying process.

Key words: *cabya, oven-drying, physical properties, digital image analysis*

Farmer Decision Making in the Adoption of New Planting Area Expansion Program (PATB) in Ngargotirto Village, Sumberlawang District, Sragen Regency

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Abstract

New Planting Area Expansion (PATB) is a program launched by the government to realize food security in the food crop sub-sector. The success of the New Planting Area Expansion (PATB) program is certainly supported by the willingness of farmers to adopt the New Planting Area Expansion (PATB) program. Decision-making is a crucial process in the innovation adoption process. This study aims to examine farmers' decision-making in the adoption of the New Planting Area Expansion (PATB) program in Ngargotirto Village. The research location was determined purposively. The sampling technique used was proportionate stratified random sampling, with a sample of 67 respondents. The research method used is a quantitative method with survey techniques. The analytical method used is descriptive analysis. The results showed that farmers' decision-making in the adoption of the New Planting Area Expansion (PATB) program in Ngargotirto Village at the knowledge, persuasion, and decision stages were in the sufficient category, while the implementation stage was in a low category, and the confirmation stage was in the high category.

Key words: *adoption, decision making, expansion of new planting areas, food crops.*

Study Of Farmer Satisfaction Level On The Quality Of Agricultural Services In The Muang In Environment Explanation Lempake North Samarinda District

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Abstract

Extension workers are an important sector that supports national agriculture. The quality of agricultural extension can be determined by comparing the farmers 'satisfaction with the services received with the services expected by the farmers. The purpose of this study was to find out how farmers' perceptions of the quality of agricultural extension services, know farmer expectations and the level of suitability and efforts to achieve farmer satisfaction. The location was determined purposively, namely in the Muang Dalam neighborhood, Lempake Village, North Samarinda District. This conducted for three months, from March to May 2020. Research was Respondents in this study were farmer groups selected through themethod simple random sampling, where each The names of the members of the farmer group who will be randomly selected by a lottery system and those selected will be respondents in the study as many as 38 respondents, the analytical tool used is themethod Aritchmetic Mean and Importance Performance Analysis (IPA). The results of the calculation of theanalysis Aritchmetic Mean show that the perception of farmers with an average value of 3.84 is in the category (Good) and the assessment on the expectations of farmers with an average value of 4.21 is in the category (Very High). Seeing the level of conformity between farmers 'perceptions and expectations of the quality of agricultural extension services in this study, in general the results were 91.26%, the value was less than 100%, this indicates that farmers' perceptions of the quality of agricultural extension services were not in accordance with the expectations of farmers in the environment. Muang Dalam Lempake Village, so it can be said that the farmers are not satisfied. Efforts that must be made by extension workers to increase farmer satisfaction are focused on reliability where agricultural extension agents must be able to help farmers to collaborate with other parties in the form of business capital and market information.

Keywords: *Service Quality, Agricultural Extension, Satisfaction.*

Azolla Compost-Based Organomineral Fertilizer for Increasing N Uptake, Growth, and Yield of Green Onion

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Abstract

More information on the requirement of azolla compost-based organomineral fertilizer (AOF) for optimum performances of green onion is needed due to the slow release nutrient characteristic. This research aimed to determine the optimum dose of AOF for maximum N uptake, growth, and biomass yield of green onion. The pot experiment was conducted at the Teaching and Research Field of the Faculty of Agriculture on outskirts of Bengkulu University campus, Indonesia from December 2020 to February 2021. The treatment was AOF application at seven N rates (0, 0.80, 1.60, 2.41, 3.21, 4.01, and 4.82 g plant^{-1}) and was arranged in a completely randomized design with three replications. Results revealed that the increase in optimum dose of AOF application enhanced N uptake, growth (stem diameter, root dry weight, and shoot dry weight), and biomass yield (shoot fresh weight plant^{-1} and shoot fresh weight clump^{-1}). The application of AOF at 2.18 g plant^{-1} gave the highest shoot fresh weight clump^{-1} (87.73 g). The highest N uptake (18.32 mg plant^{-1}) was achieved at 2.41 g plant^{-1} of AOF. Thus, the use of AOF could be a promising approach to enhance crop productivity.

Keywords: *fertilization, mineral fertilizier, organic fertilizer, slow nitrogen release*

Determinants of Value Addition in Copra Processing in Central Buton District of Southeast Sulawesi

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Abstract

The study aimed to assess value addition in copra processing and to determine the factors that affect value addition in copra processing. This research was carried out in Mawasangka Subdistrict, Central Buton District, Southeast Sulawesi Province. The population in this study was 51 copra producers. Respondents were determined using census method through which the entire population was selected as respondents. Hayami method of production structure was used to calculate value addition, whereas multiple linear regression was employed to determine the factors affecting value addition. Study results showed that the average value added of copra processing is IDR749,38/kg of raw materials. The regression results revealed that all independent variables, namely, the number of coconuts, labor wages, copra prices, coconut prices, and other inputs, jointly had a significant effect on the value added. Partially, the copra price, coconut price, and other input contribution have a significant effect on the value added, while other variables do not.

Key words: *copra, determinants, processing, Sulawesi, value addition*

Improvement Of The Sensory Profile Of Cocoa Powder From Unfermented Beans By Means Of Water Incubation

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Abstract

Unfemented cocoa bean has an astringent and bitter taste and a weak aroma. It lacks of precursors of aroma due to incomplete enzymatic processes within the nib. The enzyme could be reactivated by means of water incubation. Unfermented cocoa beans were dried, deshelled, ground and pressed to produce powder. It was mixed with distilled water at ratio 1:1.5 and was incubated for 0, 4, 8, 16 hours. A powder from fermented cocoa was prepared as a control. Parameters observed were total polyphenols, reducing sugars, and sensory profile by Quantitative Descriptive Analysis (QDA) method. Principal Component Analysis (PCA) and Pearson Correlational analysis were performed to assess the relationship between parameters. The sensory evaluation shows that untreated powder is characterized with green, earthy, astringent, and bitter notes. Powder from 4 hour and 8 hour treatments have a pleasant sweet taste. Fermented cocoa powder has a well defined chocolate, nutty, and flowery notes. There was a strong positive correlation between polyphenol content and bitter (0.95*) and astringent (0.93*) notes, as well as between reducing sugar and sweet (0.30), nutty (0.76), chocolate (0.68), caramel (0.65), fruity (0.87), and flowery (0.71) notes. These correlations could be used to predict sensory quality from polyphenols and reducing sugar content. This study demonstrates the potential of water incubation method to improve sensory quality of cocoa powder from unfermented beans.

Keyword: *unfermented cocoa powder, incubation, principal component analysis, sensory profile*

Effect of Cattle Manure on Productivity and Attacks of Major Pests and Diseases on Inpari 24 Rice Varieties

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Abstract

Giving or adding cattle manure in rice cultivation is known to increase the productivity of rice plants. Rice varieties Inpari 24 (brown rice) is one type of rice that contains high anthocyanins as antioxidants that are good for health. This study aims to determine the effect of fertilization on the productivity of the Inpari 24 rice plant and the attack of pests and diseases. This research was carried out in the experimental garden of the Indonesian Agricultural Environmental Research Institute in Sidomukti Village, Jaken District, Pati Regency, Central Java from March - July 2020 (MT 2). The research design used was a non-factorial Randomized Block Design (RBD) with 3 replications. The factors that were tried were no fertilizer (P0), recommended NPK fertilizer (P1), cattle manure 10 t/ha (P2), cattle manure 10 t/ha + recommended NPK (P3), cattle manure 20 t/ha (P4), cattle manure 20 t/ha + NPK recommended (P5). The results showed that the application of cattle manure had a significant effect on the productivity, intensity of brown leafhoppers and leaf blast disease, but not significantly different on the intensity of rice stem borer and bacterial leaf blight. Provision of cattle manure provides higher rice productivity. In addition, it also reduced the intensity of brown planthopper attacks and leaf blast disease, except for P2 treatment.

Keywords: *Cattle manure, productivity, inpari 24, pests and diseases*

Responses of Roots and Leaves in Nine Varieties of Chili Pepper (*Capsicum annuum* L.) to Water Saturated Rhizosphere

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Abstract

Water saturated rhizosphere (WSR) can be caused by partial submergence of growing substrate such as in floating culture system (FCS). This WSR directly influence metabolism and development of not only underground organ (roots) but also above ground organ (leaves). Objective of this study was to assess responses of root and leaves of nine Indonesian varieties of chili peppers exposed to two levels of WSR conditions, i.e. 1/3 WSR (W1) and fully WSR (W2). These WSR treatments were compared to untreated control plant (C0). The results showed that WSR treatments decreased leaf parameters such as number of existing leaves at end of treatments, SPAD value, total leaf area (TLA), specific leaf dry weight (SLDW), and relative turgidity (RT). Effect on root parameters included decrease of root length (RL) and ratio of root dry weight (RDW). However, 1/3 WSR treatment exhibited higher values of both root and leaf parameters than those of control plants in some varieties. There was comparable patterns of RLER in the 1/3 WSR treated plants (W1) and untreated control (C). Based on results of this study, it is recommendable to allow up to 1/3 lower part of growing substrate to be submerged in floating culture system of chili pepper

Key words: anaerobic, anoxia, chili pepper, floating culture, waterlogging

Microwave-Assisted Extraction and Characterisation of Pectin from Pineapple Biomass

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Abstract

Pectin is hydro-solid polysaccharide compound commonly used in the food and beverage industry. Pectin is used as a gelling agent and thickener in the manufacture of jellies, jams and marmalades. In the pharmaceutical field, it is used as a medicine for diarrhoea and as an additive in fermented milk products and as a metal absorber. Pectin is also used in the paper, textile and rubber industries. It is naturally found in most fruits biomass. Biomass residue from the processed-fruit industry is very potential as a source material for pectin and pectin-based products. One of the large fruit industries in Indonesia is pineapple. This study aimed to extract and characterise pectin which obtained from the pineapple waste such as pineapple peel. The method used in this study was microwave-assisted extraction (MAE). Pectin was obtained by application of citric acid solvent and precipitation of ethanol. The pectin qualification method used here was by measuring the time of cleavage of the pectate by a very pure and specific enzyme, namely pectate lyase, with spectrophotometry at a wavelength of 235 nm. The FTIR result confirmed the isolated pineapple pectin (PP) in this study substantiates the existence of galacturonic acid as the main polymer in pectin while the main peak corresponded to negative control, carrageenan (CR), as a non-pectin substance did not exist. In conclusion, pectin can be obtained from the pineapple peel by the MAE with a 10% of citric acid solution. The identification analysis suggests potential use of pineapple peel as source material for pectin and pectin-based product. Further analysis such as degree of esterification is needed to characterise its function for industry material.

Keywords: *Citric acid, FTIR, Megazyme, precipitation, spectrophotometry*

SELECTION AND RESPONSE TEST OF GARLIC VARIETY TO FERTILIZER IN ALAHAN PANJANG DISTRICT

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Abstract

Garlic is a plant that has high economic value. In West Sumatera, it was grown in Alahan Panjang in height +1400 above sea level. This study aimed to obtain the best variety of garlic that is adaptive in Alahan Panjang and the best dosage of NPK fertilizer on the growth and yield of garlic. The research was a field trial that using a Complete Randomized Design which consists of two factors and three replicates. The first factor was variety of garlic (Sembalun, Lumbu Putih, Lumbu Kuning and Lumbu Hijau). The second factor was NPK fertilizer dosage (300, 600, and 900 kg/ha). Data were analyzed using the F test with a 5% level, and if there were significant differences, the analysis was continued with the Duncan's New Multiple Range Test (DNMRT) at 5% level. The result showed that the highest tuber dry weight per plant was obtained from Lumbu Kuning variety and 600 - 900 kg/ha of NPK fertilizer gave the highest big size tuber fresh weight with the highest percentage of big size tuber fresh weight. Lumbu Kuning is the best choice to be seed tubers in height +1400 above sea level.

Keywords : *garlic, Alahan Panjang, fertilizer, tubers*

Policy And Strategy Of Developing Competitiveness Of Arabica Coffee Plant In Bondowoso Regency

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Abstract

This research aims to analyze competitiveness of Arabica coffee plant in Bondowoso regency, to have competitiveness simulation after experiencing changes in production, price, cost and exchange value and to analyze strategy to develop Arabica coffee plant competitiveness. Research areas determined by using purposive method are in Sumber Wringin subdistrict of Bondowoso regency. The applied research methods are descriptive and analytic. The applied sampling method is simple random sampling of 43 respondents of Arabica coffee plant farmers and 4 respondents of experts. The applied analysis methods are Domestic Resource Cost (DRC) and Private Cost Ratio (PCR) with the assist of Policy Analysis Matrix table, while the applied strategy of developing competitiveness is Force Field Analysis (FFA). The result of the analysis shows that Arabica coffee plant farming business in Bondowoso Regency has a high competitiveness shown by PCR value (0,29) and DRC (0,23). The result of sensitivity analysis shows that Arabica coffee plant farming business still has a good competitiveness if it is seen from the competitive and comparative superiority although there is a changing in input and output with the assumption that all factors are remain the same. Analysis FFA for the highest pushing factor is the quality of Arabica coffee plant which has urgency factor value as much as 1,97 while the highest inhibiting factor is on the limited expert workforce (1,27). The declared strategies are developing the quality of coffee plant, developing processing expertise in post harvest, doing accompaniment about Arabica coffee plant cultivation, harvesting, processing technique.

Keywords : *Coffee plant, Competitiveness, Domestic Resource Cost, Private Cost Ratio, Force Field Analysis*

Effectiveness of application of organic fertilizer on plant growth and yield of taro on dry land

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Abstract

The effectiveness of using organic fertilizers is determined, among other things, by the method of application of fertilizers. The purpose of the study was to examine the effectiveness of the application of organic fertilizer on the growth and yield of taro plants on dry land. This study applied six treatments, namely: 1) placing manure in the planting hole, 2) manure in the border, 3) spreading manure, 4) placing liquid fertilizer in a tube, 5) leaking liquid fertilizer, and 6) without organic fertilizer as control. The organic fertilizer used is based on cow manure and liquid organic fertilizer from cow urine.The treatment was repeated three times. Harvesting is done at the age of 8 months. The results showed that the placement of liquid organic fertilizer in the tube showed the highest wet tuber yield of 13.0 Mg ha^{-1} was significantly different from the placement of liquid organic fertilizer leaked with a tuber weight of only 4.5 Mg ha^{-1}. The lowest yield was shown in the treatment without organic fertilizer with a weight of only 2.5 Mg ha^{-1}.

Keywords: *Organic fertilizer, fertilizer application, taro, dry land*

Response Of Growth And Production Of Sweet Corn Plants On Ex-Cane Soil

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Abstract

Currently, the commodity that has the potential to be profitable, especially before the new year is sweet corn. One of the factors causing the low productivity of sweet corn is the low availability of nutrients and poor soil structure due to improper soil management. Currently, many soils are experiencing a decline in fertility due to improper soil management with the use of amines, especially on sugarcane. Therefore, we tried to research the response of sweet corn plants on former sugarcane plantations. The research was conducted in the Mojosari experimental garden, Mojokerto, East Java, with an altitude of ± 50 m above sea level. This experiment consisted of 2 treatment factors. The first treatment factor was 3 treatments of NPK macro fertilizer and the second factor was 4 treatments with the addition of Liftonik liquid supplementary fertilizer, using 3 replications. The highest production of sweet corn per plot was fertilized with 1 recommended dose of macro NPK (Urea 375kg; SP-36 250 kg and KCl 62,5 kg/ha) plus liquid supplementary fertilizer Liftonik at a dose of 4 ml per liter (per week). The highest yield parameters of sweet corn shavings were plants fertilized with 1 recommended dose of NPK plus liquid supplementary fertilizer Liftonik at a dose of 8 ml per liter of water. The highest RAE was in plants fertilized with 1 recommended dose of macro NPK plus liquid supplementary fertilizer Liftonik at a dose of 4 ml per liter.

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Level of Interest and Satisfaction of Farmers on Rice Farming Partnerships in Pamarican District, Ciamis Regency

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Abstract

Partnership is an alliance between two or more parties within an agreed period of time to form a cooperative bond in order to achieve benefits for all parties. This study aims to identify the level of interest and satisfaction of rice farmers with the partnership. The research was carried out in Pamarican District, Ciamis Regency from July to August 2021. The location was chosen purposively with consideration of the implementation of a partnership between rice farmers and PT. Mitra Desa Pamarican (PT. MDP) in Pamarican District. The study used a qualitative approach with the number of respondents as many as 40 farmers involved in the partnership process. The level of interest and satisfaction of farmers with the partnership program was identified with a Likert scale (four scales) and analysis using an interactive model analysis mode covering the process of data collection, data reduction and drawing conclusions. The results showed that the score of the level of interest of farmers to the partnership program was 3.58 with important and very important categories. The level of farmer satisfaction with the partnership is included in the category of quite satisfied with a score of 2.05. Factors that affect the low satisfaction of farmers towards the partnership program are the purchase price of farmers' grain and the limited amount of funding assistance for rice cultivation by PT. MDP.

Key words: *partnership, rice farmers, PT. MDP, interests, satisfaction.*

Adaptation Test for Shallot Varieties in Kutai Kartanegara Regency, East Kalimantan Province

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Abstract

Shallots can grow optimally in locations that are in accordance with the growing conditions. Until now, East Kalimantan province still lacks around 7,000 tons of shallots every year, even though the potential land resources in this province are suitable for the development of shallots. Therefore, to support agricultural development, especially shallots in Kutai Kartanegara Regency, East Kalimantan Province, an adaptation test of several superior varieties was carried out, in Liang Ilir Village Kota Bangun District, Kutai Kartanegara Regency from August to October 2019. The research objective was to determine the adaptation of four superior varieties of shallots in specific location conditions in Kutai Kartanegara Regency. The research design was a randomized block design (RBD) with four shallot varieties, namely Pikatan, Katumi, Bima-Brebes, and Local, which was carried out on four implementing farmers as replications. The adaptation of Shallots using tubers, spacing 20 x 15 cm^2; dolomite lime 1.5 t ha^{-1}; manure 15 t ha^{-1}; Urea 150 kg ha^{-1}; SP-36 200 kg ha^{-1}; NPK 250 kg ha^{-1} and pest control. The results showed that the productivity of shallots from four varieties

The Soil Available-Potassium Enrichment by Several Potential Tropical Weeds

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Abstract

Plant nutrient release from soil minerals is reported to be speeded at lower soil pH, which is also governed by the acidifying effect of vegetation roots. This research was to investigate the effects of several tropical weeds on the available K in two tropical soils with distinct properties. Five potential weeds including *Asystacia gangetica*, *Arachis pintoi*, *Widelia* sp., *Paspalum conjugatum* and *Pennisetum purpureum* were grown in the soil samples contained in polybags. The soil available K was depleted by weeds except in soils planted with *A. pintoi* as indicated by the positive values of the change in the available K after four weeks growing period, suggesting that *A. Pintoi* root was more effective than the other four weeds in enhancing the soil available K. The effectiveness of weeds in enhancing the soil available K were*: A. Pintoi* > *A. gangetica* > *Widelia sp.* > *P. conjugatum* > *P. purpureum.*

Inhibition of Seed Germination Due to Water Extract from Main Plant and Ratoon Sorghum (*Sorghum bicolor* L.) Produced in Swamp Land

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Abstract

Allelopathy is a process that involves secondary metabolites produced by plants which affect the growth of surrounding plants. Sorghum is one of the plants that produce allelopathic compounds, so that it has potential as a bioherbicide. Different water extract sources have different bioherbicide potentials. Application of sorghum water extract can control weeds around the plant. The study aimed to determine the inhibition of germination of seeds given water extract of sorghum planted in swamps with different extract sources. This study used a one-factor randomized block design. The treatments were extracts from 7 weeks old sorghum plants: control, main plant leaves, main plant stems, main plant roots, ratoon plant leaves, ratoon plant stems, and ratoon plant roots. The experiment applies the bioassay method to a petri dish. Each petri dish was given 10 ml of water extract, 25 seeds of sorghum were planted and incubated for five days. The results showed that the highest germination inhibition was found in the root of the main plant and the stem of the ratoon plant, each of which had a low value indicated by normal germination (6.00%; 22.00%), plumule length (3.29 cm; 3.57 cm), radicle length (0.84 cm; 2.58 cm), plumule wet weight (0.033 g; 0.030 g), radicle wet weight (0.003 g; 0.008 g), sprouts wet weight (0.075 g; 0.075 g), plumule dry weight (0.0033 g; 0.0030 g), radicle dry weight (0.0003 g; 0.0008 g), and has a high value by cotyledon dry weight (0.0185 g; 0.0168 g), seeds did not grow (48.00%; 47, 00%), cotyledon wet weight (0.043 g; 0.038 g), and abnormal sprouts (46.00%; 31.00%). These findings indicate that sorghum derived from the roots of the main plant and stems of plants cultivated in raw land can be the best source of bioherbicides.

Key words: *allelopathy, autotoxic, bioherbicide, marginal, plant organ*

Effect of Temperature and Drying Time on The Physical Properties of *Patik Mas* (*Euphorbia heterophylla)* Leaf Tea

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Abstract

Patik mas is a type of wild plant that is rarely used and is often considered a pest, but its distribution is quite wide and has functional benefits for the health. *Patik mas* leaf tea is an innovation to make it easier to consume. This study is interested in knowing the appropriate temperature and drying time on *patik mas* leaves, with variations in temperature treatments of 50°C and 60°C and drying time of 2, 3, and 4 hours. yield and color are test parameters on the physical properties of *patik mas* leaf tea. The results showed that the drying time of 4 hours was significantly different from the drying time of 2 and 3 hours, the best treatment at a temperature of 60°C and a drying time of 3 hours with the lowest avarage yield value. The results of the color values L* *a** *b** (P>0.05) showed no significant effect on all samples. The color was produced by *patik mas* leaves for (L) tends to be bright and for colors (*a*) and (*b*) the temperature of 50°C has a lower value than the temperature of 60°C so that the resulting color is more yellow (yellowish-red). These results can be used as guidelines in the development of patik mas leaf tea products.

Key words: *Patik mas, leaf tea, physical properties, drying, temperature*

INTENSITY OF PURPLE SPOT DISEASE DUE TO ATTACK *Alternaria porri* (Ellis) Cif. IN 5 VARIETIES OF GARLIC (*Allium sativum* L.)

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Abstract

Garlic is one of the important horticultural commodities and high economic value. Low garlic production rate influenced by various factors like weather, agroecological conditions, varieties, and cultivation techniques used. The low production of garlic besides caused by decreasing in planted area as well as high disturbance of organisms plant pests. *Alternaria porri* (Ellis) Cif. is a fungus causes of purple spots on garlic plants. This disease result in significant losses for farmers. Loss of result purple spot disease in garlic reached 50% to 57% even cause crop failure. The aims of this study to determine the intensity of the purple spot disease in five varieties of garlic. This research has been conducted at the Research Institute Vegetable Plants (BALITSA) in December 2019 to April 2020. This research method uses randomized block design, consisting of five treatments, they are Sangga Sembalun, New Tawangmangu, Lumbu Putih, Lumbu Kuning, and Lumbu Hijau. The result of the research indicated that the Lumbu putih variety has the highest disease intensity compared another varieties, while Lumbu Kuning shown the lowest intensity.

Keywords: *Alternaria porri* (Ellis) Cif., Intensity of attack, variety.

The Physicochemical Properties of Taro Tuber Flour with Several Processing Methods

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Abstract

Taro can be processed into modified flour, so it has characteristics approaching *mocaf*. This research aims to know the physicochemical properties of taro flour with three different immersion treatments. Research using completely randomized design with three treatments marinade ingredients (water, addition of 0.1%, starter BIMO CF, and the addition of 0.5% *tape* yeast) and six replications. The results showed that 1) the immersion treatment with the addition of BIMO CF starter gave the lowest water and fat content, ie 9.86% and 0.76%. The highest levels of crude fiber and carbohydrates, ie, 3.81% and 66.57%, were produced by the immersion treatment with the addition of BIMO CF starter. 3) The immersion treatment with *tape* yeast, gives the highest taro flour protein content, which is 6.00%, and the brightest flour color when compared with the other two treatments. In the future, the results of this research can be used by the public to develop taro products with a longer shelf life, favored by consumers, and increased added value.

Design Of Fish Smoking With Hot And Cold Smoking Methods

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Abstract

The design of fish smoking equipment generally only focuses on one smoking method, namely hot smoking or cold smoking. Therefore, it is necessary to develop a smoking device that can be used for both smoking methods. The purpose of this study was to produce a fish smoking device for hot smoking and cold smoking methods. This study uses an experimental method by making and testing a smoking device with two methods. This study used 3 types of fish, namely paha fish (*Leptobrama* sp.), stingray (*Dasyatis* sp.), and tilapia fish (*Oreochromis mossambicus*), and the fuel used as fuel for smoking is coconut shell. The data measured included smoking room temperature data, fish weight before and after smoking. The data obtained were analyzed descriptively. The results showed that smoking fish using hot smoking and cold smoking methods with specifications, length 50 cm, width 50 cm, overall height 83 cm. This tool consists of three main components, namely, a fumigation chamber which is combined with a hot smoking biomass combustion chamber, a cold smoking biomass combustion chamber and a connecting pipe. The performance test of the tool was carried out by calculating the weight loss of fish during hot smoking and cold smoking. The smoking time used for hot smoking is 2 hours (temperature 50 – 100 ℃) and cold smoking 4 hours (30 – 45 ℃). The results showed that the highest percentage of weight loss during hot smoking occurred in stingrays on the second shelf, which was 29.25%, while the highest percentage of weight loss during cold smoking occurred in stingrays on the first shelf, which was 23.79%. The weight loss of fish in both hot and cold smoking is strongly influenced by the smoking time, the distance between the smoking rack and the heat source and the type of fish.

Key words: *smoking, heat, cold, shrinkage, weight*

Performance of Five Soybean Cultivars Grown at the Saline-Affected Soil Ammended with Soil Organic Fertilizer

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Abstract

The use of organic fertilizer and soybean variety election that have tolerant of salinity are efforts that can be applied for soybean cultivation in coastal land that salinity stress. The experiment aims to 1) determine the interaction effect between types of organic fertilizer and soybean varieties 2) to determine the best of organic fertilizer and variety soybean for growth and yields soybean in coastal land. This experiment was located at Bengkulu's coastal land with 5,3 dS salinity, June until September 2021. The research was conducted using a randomized block design. The first factor was organic fertilizer consisted of: P0=control, P1=Bokashi, P2=Vermicompost, and P3=cow manure. The second was soybean varieties consisted of: V1=Devon 1, V2=Devatra 2, V3=Dena 1, V4=Dering 1 and V5=Deja 1. Observations were growth and yields indicator, preliminary soil analysis, contents of organic fertilizer, and Na nutrient uptake. The results showed there is an interaction between types of organic fertilizer and varieties soybean. There is a difference between organic fertilizer with unfertilized or control significantly but no difference between types of organic fertilizer. The number of pod and seed weight per plant in the treatment of bokashi, vermicompost, and cow manure fertilizers were 109.62 and 27.12 g, 102.13 and 25.59 g, 97.80 and 24.42 g, while the control treatment was 57.96 and 14.33 g. There was a significant difference in varieties of treatment. The highest number of pods in the Devatra2 variety was 105.37 but not different from the Devon 1 and Deja 1 varieties at 99.41 and 99.25. The highest seed weight per plant in the Devon 1 variety was 27.83 g but was not significantly different from Devatra 2. The results also showed that the higher the yield of plants under salinity stress, the less accumulation of Na and K in plant tissues.

Key words: *salinity stress, soybean, and coastal land*

Analysis Of Surface Roughness And Chips Morphology In Teak Wood Drilling Process

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Abstract

Teak wood (Tectona grandis L.f) is one type of wood that is well known by many people because teak is a luxury wood commodity, of high quality and of high economic value. Teak wood is usually used as a basic material for building houses, home furnishings, carving crafts and also as furniture. So far, the research on teak wood machining is still minimal, so it is necessary to conduct further studies on the influence of machining parameters in order to obtain optimal values. One of the machining that needs to be researched is the drilling process. This study aims to determine the effect of variations in drilling machining parameters on teak wood. There are 3 variations of parameters used in this study, namely spindle rotation (410 rpm, 535 rpm and 715 rpm), main cutting angle (45^0, 60^0 and 75^0), and feeding motion (0.10 m/rev; 0.20 m /rev; and 0.30 m/rev). This study used a specimen in the form of teak wood with a size of 50 mm x 50 mm x 20 mm. The research was carried out by conducting a drilling process to produce chips that were used for optical microscope testing and then the drilled workpiece was used to test the surface roughness produced by using the Roughness Tester TR220. The surface roughness test was carried out 4 times for data collection with a cut off of 0.8 mm. Based on the results of the surface roughness study, it was found that the main cutting angle was the most influential independent variable, while the feed motion and spindle rotation did not have much effect. In the chip morphology research, it was found that the largest chip size was produced with a spindle rotation parameter of 715 rpm, feeding motion of 0.20 m/rev, and a main cutting angle of 60^0 with a large size of 546.54 m. As for the smallest chip size, the spindle rotation parameter is 715 rpm, feed motion is 0.30 m/rev and the main cutting angle is 75^0. From the results above, there are significant results, this happens because of the treatment and the different parameters given to each workpiece.

Optimation of factors affecting rubber farmer revenue to preserve their rubber farming business

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Abstract

Rubber farming is the main activity of rubber farmers in Musi Banyuasin Regency. Generally, a rubber farmer cultivates a quite extensive of rubber plantation area, but the production is not optimal, hence it impact on their revenue. This study was aimed to determine the factors affecting rubber farmer revenue as well as optimizing these factors to preserve their rubber farming business. This research was conducted in Sukamaju Village, Musi Banyuasin Regency, on September – October 2017. This study used multiple regression analysis with 30 respondents as the samples. The results showed that the average of farmer education was elementary school and was still in the productive age. The sources of income for farmers came from rubber farming, trading and labor. While the factors influencing their revenue were the number of farmers rubber stands (X_2), the price of rubber farmers (X_3) and the amount of rubber production (X_4). The results of this study are important to be determined because by knowing the factors affecting the farmers revenue, farmers can optimize their revenue by increasing these factors. These factors including implementation of good agricultural practice, adoption of recommended clones, as well as by selling their product through organized market

Keywords : *farmer; rubber; sustainable; factors affecting*

Agronomic Characteristics of Soybean Production Determination in Two Cultivation Techniques Attacked By Etella Zinckenella in Dry Land

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Abstract

Dry land is land that is never flooded or inundated most of the time of the year that is used for plant cultivation; Soybean is one of the secondary crops that are often planted by the community, because it is profitable and has high nutritional content; The need for soybeans continues to increase along with the increase in population; The purpose of this study was to determine the effect of pod borer on soybean yield in dry land; The experiment used a split plot design with two factors and three replications; The research material was the seeds of five soybean varieties, namely Detap-1, Dega-1, Anjasmoro, Biosoy, and Dena-1 which were planted in 2 different lands, the first land was planted using recommended techniques, and the second was planted using traditional techniques; it was concluded that soybean plant height was influenced by genetic factors of soybean plants which caused different plant height characteristics; the number of branches in soybean plants is influenced by genetic factors of each variety; the weight of 100 seeds in soybean plants as a whole has almost the same weight; Soybean crop productivity can be affected by the interaction between the treatment of cultivation technology and varieties; The intensity of pod borer attack can reduce soybean productivity (Tonnes/ha).

Keywords: *Dryland, Soybean, Cultivation Techniques, Pest Pods Borrer, Characteristic of Soybean Agronomic*

Application of Biopesticides on Existance Prime of The Pest (*Nilaparvata lugens* Stal.) and (*Scirphophaga innotata* L.) to Implication of Natural Enemies Biodiversity on Rice in Jember, East Java, Indonesia

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Abstract

This study aims to determine the potential of Biological Control Agents (BCA) and botanical pesticides against important pests of rice. The study was designed with a completely randomized design (CRD) consisting of the application of: *Beauveria bassiana* at a dose of 10^{12} spores ha^{-1},*Vertilicium lecanii* at a dose of 10^{6} ha^{-1}, red bacteria (*Serratia marcescens*) at a dose of 2. 10^{7} CFU ha^{-1}, botanical pesticides with a dose of 20 Kg ha^{-1}, and Buprofezin at a dose of 1 Kg ha^{-1} as a control treatment. Parameters observed included: population of important pests, attack Intensity, population of natural enemies, and population of potential pests. The results showed mass production of BCA *V. leccanii*, *B. bassiana*, and *S. marcescens* can be carried out in the Biocontrol laboratory. Application of BCA in the field showed that the important pests that emerged from the beginning of the observation were: the brown leafhopper, *Nilaparvata lugens*, and the yellow rice stem borer (*Triporyza incertulas*), and the golden snail (*Portula canaliculata*). The population of the two types of pests reached 0.0 – 1.5/clump and under 1 species/clump. The species of natural enemies found were dominated by Arachnida spiders, Tomcat (*Phaederus fuscipes*), and Coccinelid beetles as predators of brown planthopper pests. The population reached spiders (2 – 10 species/plot), Tomcat *Phaederus fuscipes* (24 – 34 species/plot), and Coccinelid beetles (1-6 species/plot). The results of rice crop of application BCA reached 4.82 Kg ha^{-1}. Meanwhile, botanical pesticides reached 4.72 Kg ha^{-1} and chemical insecticide treatments reached 6.11 Kg ha^{-1}.

Keywords: *Biological Control Agents (BCA), Nilaparvata lugens, Natural Enemies, Scirphopaga innotata.*

Notes on Edible Poaceae Collected at Eka Karya Bali Botanic Garden

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Abstract

Poaceae is one of the world's most notable food plant families. As an *ex-situ* conservation site, Bali Botanic Garden (BBG) has collected numerous Poaceae species plant collections since 1982. Unfortunately, the study to document the edibility of all Poaceae collections in BBG is limited as previous studies regarding the garden Poaceae collection are focusing on bamboo and limited other species. Thus, this study aims to present a list of edible Poaceae species collected in the garden. As a result, there are 13 genera of Poaceae in BBG that were found to be edible, *i.e. Bambusa, Coix, Cymbopogon, Dendrocalamus, Gigantochloa, Imperata, Neololeba, Phyllostachys, Saccharum, Schizostachyum, Setaria, Thyrsostachys,* and *Thysanolaena*. Most of them are bamboo which the shoot is consumed as cooked vegetables. However, other parts of the Poaceae plant species in this list are consumed as various dishes. In conclusion, BBG has been collected many edible Poaceae species which potentially support food security.

Key words: *ex-situ* conservation, food security, functional food, grass

Analysis of Outlook and Short Term Forecasting for Indonesian Rubber

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Abstract

In order to anticipate the impact of external problems, a review of the outlook for rubber commodities and forecasting of rubber commodities in the short term is carried out to determine policies that can be taken to maintain the sustainability of rubber industry in Indonesia. The research was conducted using the desk study method, using secondary data on rubber statistics. The data used include annual and quarterly time series data in the last 5 – 20 years. The analytical method used is descriptive analysis method and forecasting analysis using the ARIMA model. The results of the analysis show that during the 2016-2020 period, the area of rubber showed an increasing trend, with an average growth of 1.37% per year. However, rubber production shows a declining trend at a rate of 3.73%/year. Consumption performance, also decreased by 1.09% per year. The same thing happened to the performance of exports and imports, which also declined by 1.62%/year and 0.70%/year, respectively. The results of the forecasting analysis show that natural rubber production is projected to increase to 1.6 million tons in the second semester of 2021, and will continue to increase in 2022 to 3.3 million tons. Meanwhile, rubber consumption is projected to increase to 330 thousand tons in the second semester. From the results of this analysis, it is necessary to make policy proposals to the government in order to allocate research funds for high yielding rubber clones and resistant to rubber plant diseases; to increase the absorption of domestic rubber consumption as well as the export of rubber; also to increase the program to strengthen the business guarantees for Processing and Marketing Unit of raw rubber material (UPPB)/ farmer corporations as an effort to increase the quality of rubber processing materials and improve the welfare farmers.

Keywords: *outlook, short-term projection, rubber commodity*

Utilization of Moisture Sorption Isotherm in Predicting Shelf-Life of Salted-Roasted Peanut

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Abstract

So far, determination of shelf-life of salted-roasted peanut produced by one of Smart-Medium Enterprise (SME) in Gunungkidul, Bimaram, was conducted by actual observation by several members of the SME. The observation found that peanut product packaged with polypropylene plastic had the characteristics of going to be soggy faster than rancid because of moisture uptake. It was undeniable that the method was accurate, but it took a long time. Shelf-life prediction through fast, scientific, and efficient methods is essential to be conducted. One of the methods is accelerated testing with moisture content as critical parameter. Initially, moisture sorption isotherm (MSI) of salted-roasted peanut was analysed by gravimetric method and further characterized using several models such GAB, BET, Oswin, Caurie, Smith, Hasley, Kuhn, Peleg, Henderson, and Chung-Pfost. The GAB model gave the best fitting of the moisture sorption profile. Furthermore, the GAB model was utilized to determine initial, critical, and equilibrium moisture content. Those parameters were used in Labuza formula for predicting shelf life. The research found that shelf-life of salted-roasted peanut packaged in polypropylene was 4.37 months. It was agreed with actual observation method that shelf life of salted-roasted peanut was 5 months in the same condition. Based on prediction method, packaging with metalized plastic and aluminum foil can prolong shelf-life until 22.4 month and 79.6 month respectively. Nevertheless, the result has to be compromised to other critical parameters besides moisture content, such as rancidity and pH.

Key words: *moisture, sorption, shelf-life, peanut*

Gracilaria verrucosa Flour As a Nutraceutical Source: A Study Of Various Treatments on The stability of Nutritional Content and Antioxidants

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Abstract

Gracilaria verrucosa seaweed is a type of seaweed rich in polysaccharides, protein, essential fatty acids, antioxidants and other bioactive content. Generally the use of seaweed flour in the form of carrageenan as an emulsifier in food, cosmetics, animal feed and other industrial uses. Various treatments have an effect on nutritional stability and bioactive content, especially antioxidants. For this reason, this study was conducted to obtain information on *Gracilaria verrucosa* seaweed flour products that are nutritious and contain stable antioxidants. The method used in this study was a randomized block design (RAK) with fresh *Gracilaria verrucosa* variables, *Gracilaria verrucosa* with direct cabinet drying, drying and water immersion then cabinet drying, drying and fermentation then cabinet drying, drying and alkaline extraction then cabinet drying, and combination of drying, fermentation and alkaline extraction then cabinet drying. The results of the various treatments showed a significantly different effect on the ash content value, significantly and not significantly on the water content, protein content, fat and carbohydrates. The highest protein content (16.97%) in *Gracilaria verrucosa* through drying with fermentation, the highest carbohydrate (67.03%) in *Gracilaria verrucosa* through drying and alkaline extraction, the highest fat content (0.38 %), The highest ash content (28.58%) and the lowest water content (8.62%) were in *Gracilaria verrucosa* with direct drying cabinet dryer. The value of high antioxidant activity was at *Gracilaria verrucosa* fresh then *Gracilaria verrucosa* drying and water immersion followed by drying in the cabinet dryer and *Gracilaria verrucosa* with drying and fermentation followed by drying in the cabinet.

Keywords: *seaweed, Gracilaria verrucosa flour, nutraceutical, antioxidant*

Production Of Phytohormones (Iaa And Ga3) Of Rhizosphere Mushrooms As Biocontrol Fusarium Oxysporum In Shallot (*ALLIUM ASCOLONICUM* L) In Enrekang Regency

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Abstract

The control of *moler* disease caused by *Fusarium oxysporum* in onion plants in Enrekang regency still depends on the use of chemical fungicides. Plants that are symbiotic with microbes will produce phytohormones optimally so that it will trigger the level of tolerance of plants to abiotic and biotic stress including plant pathogens, so it is necessary to explore the rhizosphere mushroom of onion plants in Enrekang regency and test the production of phytohormones (IAA and GA3) to see its potential as biofertilizer and biocontrol in Shallot. This study used soil samples of rhizosphere soil of shallot taken at the shallot farming center in Enrekang regency, isolation and testing was conducted in the laboratory of plant diseases of Hasanuddin University. The results achieved there are 20 isolates with the production of IAA hormones ranging from 0.125-3,609 mg / L, the largest IAA production is found in isolates number 3 and 7, namely the genus Aspergillus, while the production of GA3 hormones ranges from 0.991-3,440 mg / L, GA3 production is released in isolate Number 3, 7, 8 which is the genus Aspergillus and isolate number 16, 17 and 19 genus Gliocladium. This shows the great potential for rhizosphere mushrooms to become biofertilizer and biocontrol products.

Key Words : *Rhizosphere mushroom, Moler, Antagonis, IAA, GA3*

Evaluation Of Service Quality At The "Merah Putih" Gamma Irradiator Using A Fuzzy Servqual Based Method

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Abstract

Since established in 2017, the "Merah Putih" gamma irradiator provides the irradiation service for various products including agriculture, herbal, medical devices, cosmetic, and other sectors. The service system was designed based on customer satisfaction which is closely related to service quality. So far, no service quality evaluation has been carried out, hence, this study was conducted aimed to determine the performance of service quality which related to customer satisfaction. The present study was designed using a fuzzy servqual method with five dimensions including tangibility, reliability, responsiveness, assurance and empathy. The data were collected from 33 customer's polling of expectation and satisfaction questionnaires. The validation and reliability testing was conducted to ensure the quality of data. The results showed that the gap value of the five dimensions has a negative value. The highest gap value was the reliability with the gap value of 0.509 and the lowest was the responsiveness with the gap value of 0.003. The further result revealed that the performance index of service quality was less than 1, this means that improvements are needed on all service dimensions. The findings of the present study provide guidelines and alert the management that the quality of service was not in accordance with the customer's expectations. In addition, this study provided evidence that to achieve a high level of public services, service quality evaluation should be assessed periodically to monitor the level of perception and expectation of the customer.

Keywords: *Services quality, servqual, fuzzy logic, gamma irradiator*

The Effect of Composted Oyster Mushroom Baglog Waste on Rice Growth and Productivity in Acid Sulfate Soils

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Abstract

Indonesia demands appropriate land expansion for food production since the paddy fields are scaling down nevertheless the population is still increasing. Acid sulfate land has prospects for the development of agricultural areas. The land has a few obstructions in its use for paddy cultivation, including low nutrient availability high Fe^{2+} content and acidity in soil. Compost that produced using baglog waste from oyster mushroom cultivation is relied upon to be an alternative soil enhancer in acid sulfate fields. The compost contains supplements required by plants (0.74% nitrogen, 0.50% phosphorus, 8.08% potassium, 14.38% organic carbon, and a pH of 8.00) which are potential for the amelioration of soil properties, plant growth, and productivity. Accordingly, this study aims to figure the effect of the application of composted baglog waste from cultivation of oyster mushroom on the growth and productivity of paddy in acid sulfate soils. This experiment utilized a single factor completely randomized design (CRD), as a different portion of the composted baglog waste b_0 (0 ton.ha^{-1}), b_1 (5 ton.ha^{-1}), b_2 (10 ton.ha^{-1}), b_3 (15 tons.ha^{-1}), and b_4 (20 tons.ha^{-1}). The outcomes showed that the application of composted baglog waste at a portion of 20 ton.ha^{-1} (b_4) had the capacity to increase plant height, number of tillers, plant dry weight, weight of 100 grains, and paddy productivity, respectively by 24%, 115%. , 65%, 39%, and 66% contrasted with the control treatment (b_0).

Key words: *Composted baglog waste, acid sulfate soil, amelioration, paddy growth, paddy productivity.*

Chili Farmers' Willingness to Continue Keeping Contract Farming with Agro-Industry in Jember Regency

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Abstract

Contract Farming (CF) is an institutional innovation to improve agricultural performance in developing countries that provides many benefits as well as a tool to perform risk management. Price and production risks are the biggest problems that faced by chili farmers in Jember. They reduce production and price risks by having collaboration with agro-industry in the form of CF which began in 2009. Many chili farmers did not continue CF because they faced several obstacles and challenges. This study aimed to (1) determine chili farmers' willingness to continue the CF program and (2) determine the factors that affect chili farmers' willingness to continue the CF program. A quota sampling technique was used by surveying 70 chili farmers in Jember consist of 35 farmers currently establishing CF and 35 farmers discontinuing CF. The data were analyzed by using proportion test and binary logistic regression. The results showed that the level of availability of farmers to continue the CF was 60%. Factors of land suitability, level of price competitiveness, accuracy of payments, and transparency in determining the quality and quantity of production results havesignificant positive effects on chili farmers' willingness to continue CF. Farmer's age has a negative effect on farmers' willingness to continue CF. The study suggests that the level of chili farmer's willingness to continue CF still needs to be increased for the sustainability of CF implementation. Increasing the level of chili farmers' willingness to continue the CF can be done by increasing the accuracy of payments and transparency in determining the quality and quantity of production, considering these two things are the main problems that chili farmers in Jember are reluctant to continue CF. Contract enforcement agencies need to be established to protect both parties from that problem.

Keywords: *Contract Farming, Chili Farmers, Jember, Willingness to continue CF.*

Physical and milling quality of local rice variety and new superior varieties in Indonesia

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Abstract

The aim of this research is to study the physical and milling quality of local and new superior varieties in Indonesia. The research material consists of one local variety (Mentik grompol) from Sleman, Yogyakarta and three varieties of new superior varieties (Sembada Merah, Sembada Hitam, and Inpari 43 Agritan GSR) were obtain from farmers in Yogyakarta. We have identified the grain physical quality (moisture content, empty+dirty grain, green+chalky grain, yellow+damaged grain, length, shape, whiteness, translucency, and milling degree) and milling quality (moisture content, yield of brown rice, yield of milled rice, head rice, broken rice, groats, green+chalky grain, yellow+damaged grain) of rice-based on Indonesia National Standard (SNI No. 0224-1987/SPI-TAN / 01/01/1993 and SNI No. 6128: 2015). The results showed that the rice grains of all varieties fulfilled the Indonesian standard grain quality class except for Sembada Merah and Inpari 43 are not fulfilled the moisture content and Sembada Merah and Sembada Hitam for empty grain requirement. Based on the quality of milled rice, the percentage of Inpari 43 (slender shape) head rice meets the premium class quality, while the Mentik grompol (bold shape) does not meet the medium 2, quality class. The milling device must be adjusted to the shape of the grain to be milled in order to increase the percentage of head rice or reduce the percentage of broken rice

Keywords: *physical and milling quality, local rice, new superior varieties*

Technical efficiency in smallholders corn crop farming: Application of stochastic frontier production function

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Abstracts

Agricultural expansion such as corn expansion is often associated with extensification and resulting land acreage loss. Best input practices could increase production and yields and thus potentially reduce land expansion. This study aims to investigate the ability of input, such as land and other factors to affect production in terms of technical efficiency, and investigate the best input practices on corn technical efficiency. Primary and secondary data are used to answer the research objectives. In this study, smallholders corn crop farming data were used in the 2019 Planting Season. A sample of 120 farmers was taken randomly by applying stratified random sampling that based on land area. Appropriate qualitative and quantitative data analysis methods are used which are distinguished based on their research objectives using the empirical model of production functions, and the technical efficiency model. The results showed that all input has an effect to increase corn yield, and support technical efficiency increasing the effect of input using. However, the effect of input using on yields appears to operate through other methods but technical efficiency increases.

Keywords: *technical efficiency, smallholders corn farming, and stochastic frontier function*

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Communication Flow of Beef Cattle Farmers in Banyuasin Regency, Indonesia

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Abstract

This study seeks to examine the interpersonal communication flow of livestock group leaders in Banyuasin Regency in increasing the motivation of their members. This study employed primary data and secondary data, through in-depth interviews, field observations, references related to this research, and data from the internet. The data analysis in this study refers to the interactive analysis model of Matthew B. Miles and A. Michael Huberman. The results indicate that based on the communication flow of the livestock group in Banyuasin Regency, downward communication where the message flows from the head of the livestock group to his/her members formally is often carried out to facilitate the process of exchanging information, work instructions, orders, explanations, and work procedures in the group. Upward communication carried out by the group members to the head of the livestock groups in Banyuasin Regency is meant to provide reports on the work or group activities, suggestions, complaints, and criticisms, whose function is to determine the appreciation and loyalty of the members to the livestock group by submitting ideas to develop the group. Horizontal communication among officials in livestock groups in Banyuasin Regency is carried out formally, through joint problem solving, and exchange of ideas among members of livestock groups by holding meetings, cooperation, and coordination among group members. In addition, horizontal communication is also carried out by fellow group members by holding relaxed meetings and discussions to develop the group and participating in trainings that can support the abilities of the members.

Key words: *Banyuasin regency, communication flow, leadership*

Taruna Tani's Perception on the Pekarangan Pangan Lestari Progam in Karangbangun Village, Karanganyar

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Abstract

Pekarangan Pangan Lestari (Everlasting Food Yard) is a program of utilizing home garden as the provider of food source and nutrition improvement for household. This research aims to find out the young farmers' perception on *Pekarangan Pangan Lestari* in Karangbangun Village. This research employed a descriptive qualitative approach with case study on Sumber Gede Young Farmer Group in Karangbangun Village, Matesih Sub District of Karanganyar Regency. Data was collected using interview, observation, and documentation. Data validity was conducted using method triangulation, while data analysis using interactive model. Informants of research consisted of the head of Taruna Tani, members of Taruna Tani, and society leaders. The result of research showed that taruna tani's perception on *pekarangan pangan lestari* is positive. Young farmers considered that the program can be additional activity to youth group, particularly in farming and food production field.

Key words: *Pekarangan Pangan Lestari, Taruna Tani's Perception*

Entrepreneurial Attitude During the Covid-19 Pandemic Women Laborer in Traditional Markets

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Abstract

Women laborer (tukang suun) is one of the professions that is popular among Balinese people. Tukang suun usually offer services to bring groceries when buyers shop at traditional markets. Tukang suun are people with low incomes who have been affected by the Covid-19 pandemic. The existence of Cash Social Assistance from the government, both regional and central governments as well as donations from philanthropy are very helpful for tukang suun. The purpose of this study was to analyze the effect of the Covid-19 Pandemic Cash Social Assistance on the entrepreneurial attitude of tukang suun. Respondents in this study amounted to 30 tukang suun who do their work in the Tabanan City market in Tabanan District. The analysis technique used is multiple linear regression equation model. The results show that the level of entrepreneurial spirit and cash social assistance simultaneously have a significant effect on the dependent variable of Entrepreneurial Success During the Covid-19 Pandemic. If viewed partially, the level of entrepreneurial spirit has a significant effect on Entrepreneurial Success During the Covid-19 Pandemic, with a high level of entrepreneurial spirit will provide enthusiasm for tukang suun in entrepreneurial success. While cash social assistance has no significant effect on Entrepreneurial Success during the Covid-19 Pandemic, this is in accordance with the situation in the field, where cash social assistance has not been received by the tukang suun at the Tabanan City Market. The tukang suun at the Tabanan City Market, only get help from philanthropists who are concerned and want to help the condition of the tukang suun who are affected by the pandemic which has resulted in a decline in the income of the tukang suun. Therefore, it is necessary to deliver targeted assistance so that it can increase the entrepreneurial spirit of the tukang suun.

Key words: *Cash Social Assistance; Entrepreneurial Attitude*

Utilization of Agricultural Waste as Biochar to Enchance the Soil Chemical Changes, Growth and Yield of Soybean Plant on Sandy Loam Soil

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Abstract

Biochar is a product of residue of agriculture biomass combustion under the limited oxygen supply. Previous experiment observed that biochar can be used as soil amendment by improving the soil quality. This study aims to determine the characteristics of biochar; to investigate the soil chemical change properties; and the response of soybean growth and yield. The experiment was arranged in Completely Randomized Design, in the pattern of factorial, testing 2 treatment factors, i.e. biochar types, and application of urea fertilizers. Data were analyzed using analysis of variance (ANOVA), followed by Honestly Significant Difference test at 5% significance level. The results indicated that there was no significant interaction between biochar types and urea fertilizer. The application of biochar types significantly improved the soil chemical changes particularly for soil pH, soil organic carbon (SOC) and *cation exchange capacity* (CEC). In addition to urea fertilizer rates also had significant effects on most observation variables. Single application of biochar or urea fertilizer increased number of leaves, total biomass production, but no significant effect on number of pods and seed yield of soybean compared to the control. However, total biomass production and number of pods and seed yield were highest when biochar and urea fertilizer were applied together, and higher than those expected from individual application of biochar or urea fertilizer. These results indicated that biochar has the potential effect to increase soil productivity provided that an appropriate type of biochar is applied, also growth and yield of soybean. Therefore, further research should be done to investigate if the application of biochar had a residual effect for the next cropping.

Keywords: *Biochar, Soil Chemical, Growth, Soybean*

Applications Of Vermicompost Fertilizer And Mycorizal Fungi On Growth Of Biduri (*Calotropis gigantea*)

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Abstract

Biduri *Calotropics gigantea* belongs to the Asclepiadaceae family and belongs to the shrub plant. Biduri seeds and stems produce fibers that can be used as raw materials for non-clothing textiles, technical textiles, and functional textiles. The quality and quantity of fiber produced by biduri is determined by the cultivation technique used, one of the most influential cultivation techniques is fertilization. This study discusses the effect of the application of vermicompost and mycorrhizal fungi on the growth and yield of biduri. This study used the RAKL experimental design with analysis of variance (Anova) and other DMRT (ducan multiple range test) at the 5% level. Factor 1 (K) is the dose of vermicompost fertilizer which has 4 levels :K0 = 0 ton/ha, K1 = 10 tons/ha, K2 = 20 tons/ha, and K3 = 30 tons/ha and factor 2 (C) is dose of arbuscular mycorrhizal fungi (AMF) in 4 level C0 = 0 gram, C1 = 5 gram, C2 = 10 gram, and C3 : 15 gram per sampel. The result of this research are dose of vermicompost fertilizer gives a real effect on the variables plant height, number of leaves, stem diameter, leaf area, number of stomata, stomata width, and leaf greenness. Dose of arbuscular mycorrhizal fungi (AMF) did not give real effect to all growth variables of C. *gigantea*; The combination of dose of vermicompost fertilizer and dose of arbuscular mycorrhizal fungi (AMF) did not give a real effect on the all variables.

Key words: *Calotropics gigantea*. *vermicompost fertilizer, arbuscular mycorrhizal fungi (AMF).*

Utilization of Coconut Water for In Vitro Shoots Multiplication of *Pogostemon cablin* Benth. 'Sidikalang' and Essential Oil Profile

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Abstract

Pogostemon cablin Benth. 'Sidikalang'. (Acehnese patchouli) is one of the essential oil-producing plants which has therapeutic properties and fixative materials for perfume, so the demand for patchouli oil is relatively high. However, these advantages of patchouli are in contrast to the low quality of patchouli oil and the fluctuating prices in the international market. Therefore, patchouli's plant tissue culture technique is developed to obtain oil with a uniform and a better quality one characterized by a high level of patchouli alcohol in patchouli oil. This study aims to determine the effect of coconut water and BAP of in vitro shoots multiplication of *Pogostemon cablin* Benth. 'Sidikalang' and to compare the in vitro essential oil profile to the native plant. Hence, in vitro shoots multiplication of patchouli in this study was done by using solid and liquid MS (Murashige-Skoog) medium with the treatment of 10% coconut water, 15% coconut water, 10% coconut water + 0.5 mg.L^{-1}BAP (Benzyl Amino Purin), 15% coconut water + 0.5 mg.L^{-1} BAP, and 0.5 mg.L^{-1}BAP. Patchouli leaves hydrodistillation was done for six-week-old shoots derived from liquid MS medium with the giving of 0.5 mg.L^{-1} BAP, which had the best growth index (25,48 ± 4,52). Morphologically, the growth of patchouli in the solid medium was not as good as in the liquid medium because more rosette shoots were found. The analysis results of UV-Vis spectrophotometry and gas chromatography showed that in vitro essential oil profile were same as the native plant (ex vitro) and its commercial patchouli oil.

Key words: *in vitro shoots multiplication, Pogostemon cablin Benth., patchouli oil*

The Phytoremediation Potential of Several Plants in Heavy-Metal Polluted Tropical Soils

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Abstract

A significant number of plants were suggested potential to alleviate toxic levels of heavy metals in soils through phytoremediation. This research was to study the phytoremediation potential of several plants in heavy-metal polluted tropical soils. Soil samples were collected from experimental plots amended in 1998 with 0, 15, and 60 Mg industrial waste ha-1. The soil samples were planted in a glass-house experiment with 3 different plants i.e caisim (*Brassica chinensis var. Parachinensis*), water spinach (*Ipomoea aquatica*), and lettuce (*Lactuca sativa*). Plant parts (roots and shoots) and soil samples were harvested after a 4-week growth period and analyzed for Zn. The results show that the growth of plants was depressed by the increase in the soil Zn as affected by waste treatment, with water spinach being the most progressive and producing the greatest biomass. All plants significantly decreased the concentration of Zn in soils, with water spinach decreased the most significantly. The absorption of Zn increased with the soil Zn (high linear R2). Zinc was accumulated greater in plant roots than that in shoots. All plants were good Zn phytostablizators.

Keywords : *Heavy Metals, Phytoremediation, Phytostabilization, Pollution*

Resources on the Smallholder Dairy Cattle In Indonesia

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Abstract

Resources play an important role in the sustainability of the business system. The purpose of this research is to examine the influence of human resources of farmers on the access of farmers to the resources of the smallholder dairy farming business. The research was conducted in 2019 in Pujon Subdistrict, Malang District. The research variables consist of human resources of farmers (X), economical resources (Y_1), environmental resources (Y_2), and social resources (Y_3). The research was conducted using Focus Group Discussion (FGD), observation, and survey methods. The survey method was conducted by interviewing and filling out questionnaires. The number of respondents was 196 dairy farmers. Data were analyzed descriptively and simple linear regression analysis using SPSS 26.0. The results showed that the human resources of farmers had a positive and significant effect on farmers' access to economical resources of 0.437; environmental resources of 0.218; and social resources of 0.389. The conclusion of the study shows that the human resources of farmers determine the access of farmers to resources. The recommendation of this research is the need for efforts to improve the quality of human resources of farmers through farmer empowerment in accordance with Government Regulation No. 6 of 2013.

Key words: *dairy cattle, resources, economical, environmental, social*

Financial Feasibility of Sheep Business through Improvement of Farmer Business Scale

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Abstract

This research was conducted in Tugu Jaya Village, Cigombong Subdistrict, Bogor District, West Java Province, in 2019, on smallholder sheep farmers. The purposes of this paper is to determine the financial feasibility of sheep business through improving the scale of maintenance. The study used survey methods, interviews, and filling out questionnaires on 24 sheep farmers. Primary data and secondary data were analyzed descriptively, quantitatively, and economically. The results showed that the profit from the traditional ram fattening business with a scale of 10 heads was IDR 10,480,000/farmer/period and the results of the analysis showed an R/C value of 1.62. The profit from fattening rams in the same way on a scale of 5 heads is IDR 3.997.500/farmer/period, with an R/C value of 1.41. The profit from breeding ewes on a scale of 3 heads is IDR 1.121.000/farmer/year, with an R/C value of 1.30. The profit from breeding ewe on a scale of 2 heads is IDR 375,000/farmer/year with an R/C value of 1.11. Financially, the sheep business is feasible to be continued by each farmer, because it will increase their economic value. The business of fattening rams on a scale of 10 heads can be increased to a scale of more than 10 heads/farmer and a breeding business of ewes from a scale of 3 heads, needs to be increased to more than 3 heads/farmer, so that the economic value of farmers will be optimal.

Key words: *Sheep business, farmers, scale of rearing*

Tannins Contents in Tradisional Medicine Plants of The Sumenep Community

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Abstract

Wild plants are types of plants that can grow in unwanted places and include weeds. The use of wild plants both as traditional medicine and even for food has been applied by rural communities. *Biden pilosa* (BP), *Peperomia pellucida* (PP), *Hedyotis corimbosa* (HC) are wild plants that are used as ingredients for traditional medicine by the Sumenep communities. The nature of wild plants that are able to grow in various conditions indicates a variety of secondary metabolites that may be produced, one of which is tannin. Tannins are secondary metabolites that are included in the class of polyphenolic compounds that are commonly found in leafy plants and have water-soluble properties. Tannins have many benefits, namely as antidiarrheal, antibacterial, astringent, as well as antioxidant. The study aimed to identify tannin compounds in 3 types of wild plants that are used as traditional medicinal ingredients by the Sumenep Madura community, including BP, PP, and HC. Research stages include the manufacture of natural simplicia powder, extraction process, and identification of tannis. Simplicia made by ovenwith temperature 50◦C. Simplicia of plants calculated the percentage yield. Extraction process of tannin compounds using maceration technique with 2 types of solvents, namely 95% ethanol and aquades. The results of the measurement of the yield of each plant are BP 19.33%, PP 4.98% and HC 20.37%, The results of tannins showed that the three natural ingredients were positive for tannin.

Key words: *Biden pilosa, Peperomia pellucida, Hedyotis corimbosa, tannin*

Formulation of Lemongrass and Lemon Essential Oil Nanoemulsion Stabilized with Soybean Protein Isolate and Lecithin

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Abstract

Mixtures of various essential oils are shown to have high biological activities such as antioxidant and antibacterial due to the synergistic effect of their components. This effect could be enhanced by preparing the mixture in nanoemulsion. The present study formulated and evaluated lemongrass and lemon essential oil nanoemulsion stabilized with soybean protein isolate (SPI) and lecithin treated by ultrasonication at 150 W and 24 minutes. Three formulas of lemongrass:lemon were used as followed respectively 3.65:0.45, 1.45:2.25, and 0.05:4.05. All of the emulsion mixtures had negative surface charges with pH values higher than the isoelectric point of SPI. High ratio of lemongrass essential oil in the emulsion showed an increase of particle size that may indicate SPI-lecithin was not the most adequate nanoemulsion carrier of the oil. Emulsion containing the most balanced ratio of each essential oil showed high polydispersity index. However, the absolute ζ-potential values higher than 20 mV showed that all of the emulsion mixtures have good stability.

Keywords: *Nanoemulsion, Essential oil, Lemongrass, and Lemon*

Response of 16 Rice Varieties (*Oryza sativa* L.) to High Temperature at Vegetative Stage

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Abstract

16 rice varieties (*Oryza sativa* L.) were evaluated for their tolerance to high temperature up to 8 weeks after planting. The rice varieties consisted of drought tolerance rice varieties, black rice varieties, low-land varieties, and commercial varieties. The experiment was conducted using split plot design with high temperature as main plot and varieties as sub plot with three replications. The treatment for high temperature consisted of control (normal temperature), over 38^{o}C (at noon), and over 40^{o}C (at noon). The result showed that high temperature affected plant height, tiller number per plant, leaf number per plant, shoot fresh weight, shoot dry weight, root fresh weight, root dry weight, root number per plant, and chlorophyl content. There was also significant difference between the tested varieties on plant height, tiller number per plant, leaf number per plant, shoot fresh weight, shoot dry weight, root fresh weight, root dry weight, and root number per plant. The interaction between high temperature and variety was significant on plant height, tiller number per plant, leaf number per plant, shoot fresh weight, shoot dry weight, root fresh weight, root dry weight, root number per plant, and chlorophyl content.

Keywords: *high temperature, rice variety, tolerance, susceptible, and vegetative stage.*

Exploration Of Plant Resources Producing Salicylic Acid As A Prospective Natural Agents Inducing Plant Resistance

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Abstract

Salicylic acid is a defence signalling compound that appears as a response of plant resistance to pathogen infections. The application of salicylic acid exogenously is applied as a resistance-inducing agent that affects the increase of plant resistance. However, exogenous salicylic acid which applied to plants is generally formed as synthetic salicylic acid. Based on this, a study was conducted with a purpose to explore of plant resources that have high salicylic acid content. The research is expected to provide the information related to plant sources that have high salicylic acid content which could potentially become plant resistance-inducing agents. The plant material used in this research were rhizome part (ie ginger, aromatic ginger, turmeric, galangal, calamus, pink and blue ginger, and cassumunar ginger), leaves part (ie Chamberbitter leaves, Madagascar periwingkle leaves, December tree leaves, Moringa leaves, Soursop leaves, Heartlef maderavine madevine leaves, fameflower leaves, ornamental pepper leaves, Piper betle leaves, Barbados nut leaves, Masrsh fleabane leaves, Snowberry leaves, Brotowali leaves, Bay Leaf, lemon basil leaves, Sambong leaves, God'crown leaves, Spiny amaranth leaves, Sulfur cosmos leaves, Mimosa leaves), and stem-flower part (ie Lemongrass, butterfly Pea flower, Cinnamon, Aloe vera, and Brotowali stem). The results showed that there were 5 plant resource showed high absorbance in the salicylic acid content assay by using a spectrophotometer, namely cassumunar ginger, aromatic ginger, God's crown leaves, chamberbitter leaves and cinnamon.

Keywords: *exploration, plant resources, salicylic acid*

Exploring Daily Diet and Physical Activity Habit Changes Associated with COVID-19 Pandemic: A case Study of Java Island.

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Abstract

At the end of 2019, the SARS-Cov2 virus was discovered in Wuhan, China, which caused the worldwide Covid-19 pandemic. On September 6, 2021, based on data released by the Ministry of Health of the Republic of Indonesia, the number of people exposed to COVID-19 in Indonesia was 4,123,617. One of the important factors to consider in living daily life during the COVID-19 pandemic is maintaining the immune system. A good immune system is also supported by daily habits and environmental factors, such as eating habit, physical activity, stress management, and socio-economic conditions. The purpose of this study was to determine the changes that occurred, especially in eating habits and physical activity, during the pandemic COVID-19 among the Java Island population aged ≥ 18 years. The structured questionnaire consists of demographic information, anthropometric data, dietary habits and physical activity habits information. The survey was conducted from June 1 to July 2 2021. This study provides data on eating habits and physical activity patterns in Java Island during the COVID-19 pandemic. The participants are ranging in age from 18 to 63 years old (57% women and 63% are married). As many as 87% of respondents consume rice in portions of 100-1000 grams per day for three meals. Sixty-six per cent of those polled said their lifestyle and eating habits had changed due to the pandemic. Consumption of fruits and vegetables increased by 55%, while herb consumption increased by 37%. Despite only a 5% increase, there was an increase in workout habits during the pandemic (before the pandemic, 80%). However, the frequency of exercise increased to 3-4 times per week.

Key words: *COVID-19, eating habits, physical activities.*

Isolation and Characterization of Rhizobacteria Bacillus spp for Bacterial Leaf Blight Disease Control and Shallot Yield Improvement

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Abstract

Xanthomonas axonopodis pv. *allii* (Xaa), which causes bacterial leaf blight on shallots, can cause yield losses both in quantity and quality, can even reach 100%. Indigenous Rhizobacteria, Bacillus spp., has effectively controlled plant diseases and increased plant growth and yields. The study aimed to obtain a type of Bacillus that could control bacterial leaf blight and increase the yield of shallots. The study consisted of 3 stages: first, isolation of *Bacillus* spp. from soil and shallot roots in production centers and endemic areas for bacterial leaf blight in Solok and Agam districts, West Sumatra. The second, bacterial leaf blight control with *Bacillus* spp. The research was experimental in the experimental garden of the Faculty of Agriculture, Universitas Andalas, Padang, consisting of 43 treatments and three replications. The treatments consisted of 40 isolates of *Bacillus* spp., Streptomycin, positive control (without Xaa and *Bacillus* spp.), and negative control (Xaa inoculated, without *Bacillus* spp.). *Bacillus* spp. introduced to shallot seeds. Xaa is inoculated by injuring the surface of the leek using a sterile needle, then Xaa suspension is applied to the injured area, and the plant is covered with clear plastic. Third, identification and characterization of *Bacillus* spp. selected. The results obtained 40 isolates of *Bacillus* spp. but only ten isolates could increase the resistance of shallots to bacterial leaf blight and shallot yields. The results of the molecular identification test of 10 isolates of *Bacillus* spp. indicates the type of isolate. MRTLRZ2.1 is *Bacillus thuringiensis* strain ATCC 10792, MRSNRZ1.2 is *Bacillus mycoides* strain ATCC 6462, MRBPRZ1.1 is *Bacillus thuringiensis* strain IAM 12077, MRRZLL2.2 is *Bacillus mycoides* strain ATCC 6462, MRRDE3.4 is *Bacillus weihenstephanensis* strain ATCC 6457, MRTDE2.6 is *Bacillus subtilis* BSn5, MRSNE5.1 is *Bacillus cereus* strain RSA21, MRPLE3.1 is *Bacillus subtilis* strain CIFT MFB 4158A, MRBPE1.1 is *Bacillus* sp. RD_AZPVI_03, and MRTPE1.3 are *Bacillus* sp DSM 4480. The results of biochemical characterization of 10 selected *Bacillus* spp. showed that *Bacillus thuringiensis* strain ATCC 10792 and Bacillus mycoides strain ATCC 6462 could produce siderophores, salicylic acid, proteases, and ammonia. *Bacillus mycoides* strain ATCC 6462, and *Bacillus subtilis* strain CIFT MFB 4158A were able to produce siderophores. *Bacillus thuringiensis* strain IAM 12077 was able to produce siderophores, salicylic acid, and proteases. *Bacillus* sp. RD_AZPVI_03 can produce salicylic acid, protease, and ammonia. *Bacillus cereus* strain RSA21 was able to produce siderophores and salicylic acid. *Bacillus subtilis* strain CIFT MFB 4158A was able to produce siderophores and proteases. *Bacillus subtilis* BSn5 was able to produce salicylic acid and ammonia, while *Bacillus weihenstephanensis* strain ATCC 6457 produced ammonia. All isolates produced biosurfactants but did not produce cyanide and hemolysis (negative).

Keywords: *Bacillus* spp., shallot, bacterial leaf blight, indigenous, rhizobacteria

DETERMINATION OF THE OPTIMUM DOSAGE OF N FERTILIZATION IN ACHIEVE OPTIMIZATION OF PERCENTAGE OF HYBRID RICE GRAIN CONTENTS

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Abstract

Hybrid rice has begun to be developed by researchers to support the increase in national rice production because of its nature which can produce higher production than inbred rice. However, in Indonesia, the increase in hybrid rice yields has not met expectations, one of which is due to the lack of careful application of cultivation techniques, including fertilization techniques. This research was conducted to determine the optimum dose of nitrogen fertilization in hybrid rice, which can support the acquisition of the highest percentage of grain content. This research was used a Completely Randomized Block Design with two factors and three repetitions. The first factor was the dose of N fertilizer (0 kg N/ha, 100 kg N/ha and 200 kg N/ha), the second factor was hybrid rice varieties (Mapan-P05, Intani 602 and SL8SHS-Sterling). The variables observed included growth characteristics and yield components of hybrid rice (percentage of grain content). The research data were analyzed by analysis of variance and polynomial regression. he results showed that the optimum dose of N fertilization for Mapan-P05, Intani 602 and SL8SHS-Sterling varieties were 98.79 kg N/ha (R2=0.805), 103.34 kg N/ha (R2=0.919) and 122.49 kg N/ha (R2=0.918).

Keyword: *N fertilizer, hybrid rice, percentage of grain content.*

Potential And Characteristics Of Genetic Resources Of 7 National Superior Red Onion Varieties In Indonesia

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Abstract

Shallots are a strategic Indonesian commodity that has high economic value and is one of the causes of inflation. Since Indonesia has released 46 superior varieties of shallots and 7 of them come from East Java. The condition before the existence of superior varieties of shallots from specific local origins in East Java, the productivity of East Java's shallots was below 7.5 tons / ha, whereas after the release of superior varieties, the productivity in 2020 was an average of 9.6 tons / ha or increased. 27.63%. This activity was carried out from 2010 to 2018 in several East Java districts, namely Nganjuk, Probolinggo, Malang, Sumenep and Pamekasan. The research was carried out by characterizing the performance of 7 superior varieties namely Super Philip, Bauji, Batu Ijo, Biru Lancor, Rubaru, Monjung and Tajuk to determine the potential and characteristics of the seven varieties in various development locations. The research was conducted through a survey with purposive sampling. The vegetative and generative growth performance was observed according to the nature of the growth as well as the specific characteristics of each variety. The results of the plant diversity and genetic potential of the 7 superior varieties showed that each variety had specific characteristics, namely Super Philip, Blue Lancor and Canopy suitable for planting in the dry season in the lowlands to medium with the respective productivity of 18 t / ha, 16 t / ha , 19 t / ha. Whereas those that are suitable for the rainy season are Bauji, Rubaru, Monjung in the low to medium lands with respective productivity of 18 t / ha, 16 t / ha and 18 t / ha and are tolerant of Fusarium sp .. While Batu Ijo which has large tubers (15-20 g / tuber) suitable for the rainy and dry seasons in the highlands (800-1,500 m asl), productivity 14 t / ha and tolerant to Fusarium sp.

Keywords: *shallots, genetic resources, characteristics*

Pollinating Insects in Honey Pumpkin (*Cucurbita moschata* Dusch) and Sweet Corn (*Zea mays* L. Saccharata Sturt) Agroecosystems

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Abstract

This research was conducted to determine the abundance of species, frequency and time of visit of pollinating insects in the honey pumpkin and sweet corn agroecosystems. The research was carried out at the Teaching and Research Farm and Plant Pest Laboratory, Faculty of Agriculture, Jambi University from November 2020 to February 2021. The method used was the exploratory survey method. Data collection was carried out by direct observation and insect collection using a sweeping net on several plant samples that had been systematically determined with a diagonal (X) pattern. Insect observations were carried out every day starting from 07.00-18.00 WIB on 1 honey pumpkin plant and 1 sweet corn plant and observed again in the following week during the generative phase. The data obtained were analyzed quantitatively and graphed to compare each type of insect that visited. The results showed that there were 6 types of pollinating insects found in honey pumpkin and sweet corn: *Vespa tropica* (Hymenoptera: Vespidae), *Vespa velutina* (Hymenotrea: Vespidae), *Apis cerana* (Hymenoptera: Apidae), *Apis dorsata* (Hymenoptera: Apidae), *Xylocopa latipes* (Hymenoptera: Apidae), and *Trigona* sp (Hymenoptera: Apidae). The time of visit of pollinating insects indicates the specific time of visit, namely at 07:00-11:00 WIB on honey pumpkin plants and at 07:00-10:00 WIB on sweet corn plants. The highest frequency of insect visits was found in *Apis cerana* species with an average visit of 15.1 times on honey pumpkin flowers and 17 times on sweet corn flowers at 7:00-8:00 WIB.

Keywords: *Insect pollinator, honey pumpkin , sweet corn.*

Development of IoT-Based Web Application for Controlled Greenhouse Environment

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Abstract

The main concept of building a greenhouse is to reduce or eliminate the adverse effects of global climate change on plants, but currently, the climate control process is manual, so the dream is to get the quantity and quality of crop production using a greenhouse still not optimal. This study presents a web-based IoT system to control and monitor temperature and humidity, the leading climate parameters in a greenhouse. This system consists of four nodes using the Wemos D1 Mini microcontroller, which controls the cooling system (Air Conditioner), lamps for the heating system, sprinkles, and blowers. Two nodes individually were also used to get humidity and temperature values from the SHT31 and the LM35 sensor. Each node is connected wirelessly via the internet network with the TCP/IP protocol. All sensor and activity data from each actuator stored in the MySQL database. The MVC concept is implemented in web development to serves requests from nodes, configures greenhouse temperature and humidity parameters, and provides periodic graphical data. The results showed that the system could automatically activate the cooling and heating when temperatures are less than 26 ºC and more than 30 ºC. Furthermore, the system automatically starts the blower to refresh the air in the greenhouse's interior and sprinkles if the humidity value is less than 65% or more than 80%. In addition to helping users maintain the temperature and humidity of the greenhouse, this system also reduces the turn-on time of the actuators when manual process, thereby reducing the cost of electricity bills.

Key words: *Greenhouse, Microcontroller Node, Internet of Things, Web Application*

Tracking of five decades land use and land cover change in Bedadung watershed: learning from Landsat data

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Abstract

The land use and land cover (LULC) change can potentially propagate the hydrological alteration and caused severe hydro-meteorological disasters (such as landslide, flood or flood, or drought) that potentially occurred around the watershed areas. LULC change assessment in long time series is the primer step to evaluate and better manage the sustainability of natural resources on the watershed. In this study, the Landsat images (dated from 1970 to 2020) were used as the primary input to calculate the LULC change in the Bedadung watershed. The watershed (1002,85 km2) covers about 30% of the Jember regency area. The City of Jember is located in the middle of the watershed. This study use Landsat 1 MSS, Landsat 5 TM, Landsat 7 ETM+, Landsat 8 OLI/TIRS captured from 1972 to 2020 as main input. The images data are processed using open-source image processing software. Furthermore, classification processes apply to produce LULC maps of 1972, 1997, 2002, 2017, and 2020. The LULC change is analyzed by comparing the area extent occupied for eight LULC classes (i.e., built-up or pavement areas; paddy field; heterogeneous agricultural land; dense vegetation; sparse vegetation; barren land/sand/rock; shrubland; and water body. The results show that the change of pavement area slightly increase (by 3,63 % average) from 1972 to 1997 (25 years), and then increase significantly by 9,59% (average per year) from the period 1997 to 2020 (23 years). However, a very significant increase was observed from 2017 to 2020, by 16,49% a year. The pavement area increases significantly in the City area of Jember during the last years and shows the rate of LULC change resulted from human-induced activities (i.e., residential use, industrial sites, road, and city infrastructures).

Keywords: *Landsat, Land use, Land cover, Change, Bedadung, Watershed.*

Detection of Pesticide Residue in Forage for Dairy Farms in Jember District, East Java

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Abstract

Forage feed plays an important role in providing energy and fiber sources for milk production in dairy cows. Lactation dairy cows require enough nutrition in quality and quantity. Dairy farms in Jember plant forage around agricultural land to reach the need for animal feed. The use of chemical pesticides on agricultural land is feared to contaminate the forage, which is also planted around it, causing residues in forage that can result in dairy products being produced. This study was conducted to analyze pesticide residues in forage dairy cattle in the Jember district. The forage samples were taken from the 2 largest dairy farmers in Jember Regency (Best Cow and Rembangan Dairy Farm). Residual levels were analyzed using GC- and LC-based analysis. The data were analyzed descriptively whether there was contamination of pesticide residues in forage. The results showed that no pesticide contamination was found in the forage given to dairy cattle at the Best Cow and Rembangan Dairy Farm dairy farms. Dairy products (milk) produced from these farms are free from organophosphate pesticide residues.

Key words: *dairy, milk, pesticide, residue*

Dynamics of Beef Imports in Indonesia

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Abstract

The beef commodity is one of the causes of inflation in Indonesia because the highest beef price reached Rp 118,004 per kilogram in 2019, due to beef production only increased to 504,802 tons, while beef consumption increased to 683,294.46 tons in 2019, So imports the highest beef reached 266,459.00 tons also occurred in 2019. This study aims to determine the characteristics of beef production, beef consumption, beef price, and beef import in Indonesia and determine the factors that influence the dynamics of beef imports in Indonesia. This study uses secondary data for 1990-2020 from importing countries Australia, New Zealand, and the United States with panel data regression analysis. The study shows that the production, consumption, price, and import of beef in Indonesia have an increasing trend every year. Domestic beef prices and the rupiah exchange rate against US$ are independent variables that significantly affect the dynamics of beef imports in Indonesia. Domestic beef consumption, imported beef prices, and beef supply from the origin countries do not significantly affect the dynamics of Indonesian beef imports.

Keywords: *Import Dynamics; Beef Imports; Beef Production; Beef Consumption; Beef Price*

Potential of rhLF (RECOMBINANT HUMAN LACTOFERRIN) as Immunomodulator In Formula Milk For Infants With Mothers Exposed To Covid-19

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Abstract

Positive cases of Covid-19 in Indonesia have not shown a decline. The infected community also includes pregnant women and breastfeeding mothers. After giving birth, exclusive breastfeeding from mothers who are confirmed positive needs to go through several considerations. Transmission to infants can be done in various ways, one of which is horizontally, namely through droplets. This makes mothers with severe symptoms advised not to give exclusive breastfeeding, whose solution is replaced with formula milk. On the other hand, exclusive breastfeeding is very important because there is lactoferrin which acts as an antimicrobial, immunostimulant and immunomodulator. However, the content of lactoferrin in breast milk is higher than bovine lactoferrin which is commonly used for formula milk. Therefore, to obtain lactoferrin in large quantities and with a structure similar to breast milk, genetic engineering techniques were carried out in cows by injecting the human lactoferrin gene into cows to produce rhLF (Recombinant Human Lactoferrin). We will add the resulting rhLF to formula milk, so we hope to get formula milk with similar content to breast milk. The mechanism of LF as an immunomodulator has a modulating effect on adaptive immunity by accelerating the maturation of precursor T cells and the differentiation of immature B cells into antigenic cells (Rascón-Cruz et al., 2021). Antiviral mechanism is direct binding of virus by LF, LF binding of HSPGs on the host cell surface, reducing viral surfing and subsequent viral entry and LF inhibition of viral replication via induction of intracellular cell signals.

Key words: *Lactoferrin, rhLF, imunomodulator, antiviral, Covid-19*

Phylogenetic Tree Of Histone Proteins From Gonggong Sea Snail (*Laevistrombus turturella*) As Sources Of Antimicrobial Peptides (AMPs) And Its Antimicrobial Mechanisms

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Abstract

Gonggong snail (Laevistrombus turturella) is one of the sea gastropods, it is an icon of Tanjungpinang - Riau Islands Province. Until now, the bioactive exploration of its species is still limited, even though many studies showed the promising bioactivity of the sea mollusks. Our preliminary research had found the potential antimicrobial peptides (AMPs) from Gonggong. The purpose of this study was to determine the phylogenetic tree of the gonggong sea snail's histone protein which was served as AMPs and the antimicrobial mechanisms of Gonggong meat extract as sources of AMP candidates. Protein profiling was performed using SDS-PAGE. Gonggong's meat was extracted by maceration method using ethanol 95% and antimicrobial activity test was conducted using well diffusion method. Phylogenetic analysis was performed to compare the observed histone protein derivative and the histone proteins/histone peptides from other gastropod species. The antimicrobial mechanism of Gonggong meat extract in S. aureus and E. coli bacteria was observed by confocal laser scanning microscope Zeiss LSM 800. Results showed that both thin-shelled and thick-shelled gonggong meat had the same bands at the molecular weight of 20 kDa and 37 kDa. Those protein bands were identified as histone protein derivatives according to the phylogenetic analysis. They had a total of 19-20 amino acids. The gonggong meat extract containing AMPs showed effective antimicrobial activity in S. aureus and E. coli with inhibitory zone diameter reaching 21.60±0.01 mm and 14.08±0.03 mm, respectively. The damaged cell membranes and bacterial nucleoid were observed in the treated E. coli, but the treatment of extract on S. aureus only caused damage to the cell membranes. Eventually, the meat extract of gonggong sea snail was potential to be developed as source of nutraceutical candidate for natural antibiotic.

Keywords: *gonggong, histone protein, antimicrobial peptides, mechanism of antimicrobial*

Antioxidant, Anti-microbial, and Physical Properties Improvements of Turmeric (*Curcuma domestica* Val.) Effervescent Tablets with Stevia (*Stevia rebaudiana*) Leaf Powder

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Abstract

Turmeric (*Curcuma domestica* Val.) has been reported to have beneficial health-promoting effects, especially in this pandemic era. Developing effervescent tablets can facilitate turmeric consumption. However, this product generally used artificial sweeteners. The use of Stevia (*Stevia rebaudiana*) leaf powder (SLP) as a natural and calorie-free sweetener in turmeric effervescent tablets (TET) had never been studied. This study aimed to evaluate the effect of SLP addition on the TET characteristics. The TET was made using the direct compression method. There were five formulations based on the SLP concentrations (0.5%, 1%, 1.5%, 2%, and 2.5%), while 4% aspartame was used as control. An increased antioxidant activity and solubility time, a reduced total microbial number, and no effect on hygroscopicity were observed as SLP concentration increased ($P<0.05$). The higher SLP concentration also showed the higher color redness and total phenolic content, but the lower color lightness and yellowness ($P<0.05$). This probably correlated with the organoleptic test result. The SLP formulas had lower preferences in color, taste, aftertaste, and overall liking when compared to control. Based on the effectiveness test result, 1.5% SLP addition exhibited the best result. The values of antioxidant activity, total polyphenols content, total microbial content, solubility time, and hygroscopicity of this formula were 51.86%, 0.9533 mg/g, 5.3x102 CFU/ml, 115 seconds, and 5.1%, respectively. Those properties were better than that of control ($P<0.05$). Its overall liking was also ranked as the second position. The results indicated that 1.5% SLP was potentially applied to replace the artificial sweeteners in TET development.

Key words: *effervescent tablet, stevia, turmeric*

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Contribution of genotype and Bayfolan foliar fertilizer on performance of arabica coffee seedlings and its genetic component

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Abstract

Seedling is a determining factor for the success of coffee fruit production. The growth of seedling depends on its genetics and maintenance such as fertilization. The purpose of this research was to determine contribution of arabica coffee genotype and Bayfolan leaf fertilizer on performance of arabica coffee seedlings and to study its genetic components. A factorial experiment using genotype (32 levels) and Bayfolan leaf fertilizer (4 levels) was carried out with a randomized complete block design with three replications at the experimental garden of Faculty of Agriculture, Universitas HKBP Nommensen in Medan. The result revealed that genotype differences in leaf length, leaf width, leaf area, and age of first leaf formation were highly significant. Bayfolan foliar fertilizer difference in stem diameter was significant. Genotype differences were significant to highly significant in 14 of the 21 phenotype ratios (67%). Genotype and Bayfolan interactions in all of the 28 phenotypes and phenotype ratios were not significant. Genotype variance (s^2_G) contributed more than Bayfolan to total variance (s^2_T) in 24 phenotypes and phenotype ratios (86%). Twelve phenotypes and phenotype ratios (43%) had moderate to high genotypic coefficient of variation (GCV). All phenotypes and phenotype ratios showed moderate to high phenotypic coefficient of variation (PVC) and low coefficient of heritability in broad sense (H^2_{bs}). Age of the first leaf formation, ratio of plant height to leaf area, ratio of stem diameter to leaf area, and ratio of leaf number to leaf area performed moderate genetic advance in percentage of the mean (GAM). As conclusion, plant genetics plays a more important role than fertilizer for seedlings, and there is genetic variability between genotypes. In the future, this genetic variability may be used to improve seedling performance through plant breeding. The result of this research could contribute to seedling production method and coffee breeding program.

Key words: *Coffea arabica* L., GCV, genetic advance, heritability, PCV

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Land Suitability Evaluation 3D Method for Mapping the feasibility of the Gambir Plantation (*Uncaria gambir. Roxb*) in West Sumatra, Indonesia

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Abstract

Efforts to characterize the soil in the Mahat Watershed (MW), Lima Puluh Kota Regency, West Sumatra, Indonesia, have been disclosed in this study. for the evaluation of land suitability for sustainable community Gambir plantations because the Mahat watershed supplies 80% of the world's Gambir needs. The method FAO 1976 was used combined with spatial multi-criteria analysis and three-dimensional (3D) mapping. It was found that from 67 soil samples taken in the MW can be grouped into three soil orders namely Ultisols (UT), Inceptisols (IC), and Entisols (EN). This soil develops from a single parent material geology. The Physicochemical properties of the soil were analyzed using standardized methods using AAS and Spectrophotometers and 3D Mapping using the Surfer tool software. Evaluation of soil suitability based on soil sample no.1, 11-14, 18-21, 27-29, 32-34, 36-40, 43-45, 47-50, 57, 60 and no.63-65" moderate suitable "(S2) and soil sample no. 1-7, 9-10, 15-17, 22, 24-26, 52-56, 59, 62 and no, 66-67 in the class" "marginally suitable" (S3). Soil sample no. 23, 30-31, 35, 41-42, 46, 51, 58, 61 in the class “not suitable” (N) for the Gambir community plantation in the MW. Based on the analysis of the area of the 3D Map in the MW, it was found that around 17328.94 ha (48%) of the total MW area in Class (S2). An area of 13356.95 ha (37%) is classified as “marginally suitable” (S3). The area classified as “not suitable” (N) was found to be 5414.98 ha (15%). However, there was no or (0 ha and 0%) found area in the class “suitable” (S1) due to climatic factors, high soil erosion and degraded soil fertility. Through the application of soil conservation technology and balanced fertilization, Gambir soil increased to Class S2 (85%). The FAO method combined with multi-criteria analysis and 3D mapping is very helpful in determining with precision the location of the Gambir garden in classes S1, S2, S3, N in the MW and very helpful in recommending the application of soil conservation and balanced fertilization with precise location for Gambir agriculture in Indonesia as a developing countries.

Key words: *Gambir, Soil Erosion, Spatial analysis, watershed, Physicochemical properties*

Opportunity Focused, Innovativeness and Resource Leveraging: A case study on smart business factors towards food industry competitiveness in New Normal Era

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Abstract

Business sustainability in New Normal era is based on how smart is the ability of entrepreneur to maintain and develop their business especially during uncertainty during Covid-19 pandemic. Characters of entrepreneur define from the strategic management in managing their tangible and intangibles factors within their business models. This paper aims to understand the influence of intangible factors such as opportunity focused, innovativeness and resource leveraging towards business competitiveness in food industry. This is a quantitative research that is conducted in Sanan Industry of Malang which is a place of 65 home industries who are chips producers. Samplings were selected through a non-probability using the purposive method. The Structural Equation Modeling-Partial Least Square (SEM-PLS) method was used to conduct research analysis using the WarpPLS analysis tool. This study shows the results that opportunity focused and innovativeness have a positive and significant effect on the competitiveness, however improvement need to be done in resource leveraging competitiveness to survive the pandemic.

Key words: *competitiveness, chips, entrepreneurial, SME, SEM*

Purifying Pollutant Indicators in Tofu Factory Wastewater Using a Multi Soil Layering System

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Abstract

The MSL system used during this experiment was made in a field laboratory scale with dimensions (height 200 cm x width 50 cm x length 50 cm). The main component of the MSL system consists of a mixed soil layer (SML) arranged in a triangular soil horizon pattern and surrounded by a Split Rock layer as a permeable layer (SSP). SML is made from local natural resources, namely sandy clay loam, sawdust from coconut stalks (*Cocos nucifera*) and iron pellets from lathe waste with a dry weight ratio of 8 : 1.9 : 0.1. The Tofu factory wastewater is channelled into the MSL system with a hydraulic loading rate (HLR) of 400 L/m^2/hour utilizing the force of gravity. Average removal efficiency of Total Suspended Solids (TSS), Biochemical Oxygen Demand (BOD_5), Chemical Oxygen Demand (COD), Nitrate-Nitrogen (NO^{3-} -N), Phosphorus (PO^{4-} -P), Oils and grease , Electric Conductivity (EC), Total Dissolved Solid (TDS) and Salt (NaCl) were 67, 97, 97, 99, 77, 99, 78, 64 and 81%, respectively. The bad odor and color indicators of wastewater can also be efficiently removed with the MSL system. From this fact, the MSL system is efficient and capable of removing organic matter, phosphorus, nitrogen, oil and grease, odor and color. MSL system is recommended to remove contaminants from Tofu Factory wastewater.

Key words: *MSL , Wastewater, Tofu Factory, local soil and materials, Physical and chemical properties*

Using sentinel image to study the land cover change from 2015 to 2019 in Probolinggo and Pasuruan Regencies

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Abstract

Land Use Land Cover (LULC) changes represent human influences on the natural ecosystem. The LULC change can potentially propagate severe hydro-meteorological disasters (such as landslides, floods, or drought). This study aims to analyse such changes in the Pasuruan and Probololinggo Regency in East Java, a region of ±3320.3 km^2. The changes are analysed by comparing two maps derived from Sentinel-2 Images. Five subsets are explored to understand the LULC changes caused by the development of transportation infrastructure, industrial sites; the agricultural sector; tourism; urbanisation, and sub-urbanisation. Regional development from 2015 to 2019 has increased built-up areas by 99.09% (173.26 km^2) and forest plantation areas by 298.02% (661.07 km^2). Conversely, the development has reduced paddy fields by - 49.37% (-427.54 km^2) and water bodies by -16.73% (-0.43 km^2). The LULC has significantly changed the natural landscape to a human-induced landscape, which is potentially fragile to disasters.

Keywords: *Land use, land cover, change, ECHO, Sentinel-2, Pasuruan, Probolinggo*

Vegetable and Fruit Consumption and Body Mass Index Among Farmers: Data Analysis of the Integrated Non-Communicable Diseases Development Post of Jenggawah Public Health Center of Jember Regency in 2020

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Abstract

Background: Consumption of less vegetables and fruits in a person risks becoming overweight and obese. Farmers is one of the jobs that have a low risk of consuming vegetables and fruit (< 250 grams) in one day. **Objective:** The purpose of this research was to know the association between consumption of vegetable and fruit and body mass index among farmers in non-communicable diseases of integrated development post (Posbindu PTM) Jenggawah Public Health Center, Jember Regency. **Methodology:** Retrospective case control study design was used to analyze secondary data of Posbindu PTM registered from September to November 2020 among 81 farmers. The characteristics of participants, vegetable and fruit consumption, and body mass index were measured through KMS Posbindu PTM. **Results:** There was a relationship between consumption vegetable and fruit with body mass index among farmers (p-value = 0.006; χ^2= 8.725) . Among 81 farmers were identified 59.3% less consumption of vegetables and fruit per days and 53,1% of obese. Farmers who consume less vegetables and fruit have a 4 times greater risk of being obese (OR= 4.00; 95% C = 1.562 – 10.242). **Conclusion:** Consumption vegetable and fruit is correlation with body mass index among farmers. Therefore, consuming vegetables and fruits should be improved to reduce the risk of obesity among farmers.

Key words: *Vegetable and Fruit Consumption, Farmers, Body Mass Index, Obese, Non-communicable disease*

Assessment of Genetic Resources Superior Sago (*Metroxylon Sago*, Rottb) in Jayapura Regency. Waibu District Case Study

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Abstract

Currently, the sago forest is increasingly being eroded due to land conversion for housing. Therefore, conservation efforts are needed by selecting accessions that are thought to be superior to be characterized for policy makers in carrying out conservation efforts through cultivation actions. The study aims to characterize superior sago plants in Jayapura district based on plant morphological characters, designed using a descriptive method with field survey techniques. The research location is in the district of Waibu, Jayapura Regency. Outer morphological characters are the basis for distinguishing sago accessions in Waibu district, Jayapura district. The results showed that there were 4 accessions of superior sago, consisting of 2 accessions of thorny sago, namely Bata and Poro accessions and 2 accessions of non-thorny sago, namely Wani and Yebha accessions. Access Poro had the highest leaf stem height and the highest number of leaflets, respectively 12.8 m and 162 strands, the highest stem circumference and rachis length were found in Wani accession at 175 cm and 1010 cm, respectively. The largest leaf length was found in the 155 cm Wani accession and the largest leaf width was found in the 8.66 cm Yebha accession. The highest production potential was found in Bata, Poro and Yeba accessions of 225 kg starch/tree. The highest production potential was found in Bata, Poro and Yeba accessions of 225 kg starch/tree. Bata and Poro accessions from prickly sago species and Yebha from thornless sago species are selected superior accessions that are recommended for conservation through plant cultivation activities because they have relatively high yield potential.

Keywords: *Genetic resources, superior sago, morphological characters, Jayapura*

Using Landsat to track land use and land cover change from 1970 to 2020 in Mayang watershed, East Java

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Abstract

Land use and land cover (LULC) and climate change (CC) will determine the dominant effect of the hydrological processes on the watershed. The two phenomena may alter hydrological processes on the watershed. The impact may be observed as erosion, sedimentation, landslide, flood, or drought that more frequently occurs on significant magnitudes. The assessment of LULC change is a crucial step in order to manage our environment. In this context, the Landsat image is a well-suited satellite to analyse the LULC change already prouved by many researchers worldwide. In this study, the Landsat images (dated from 1970 to 2020) were exploited as the primary input to calculate the LULC change in Mayang Watershed. The Mayang watershed (1110,14 km^2) cover about 33% of the Jember regency. This watershed subject to regular floods and drought during the last decades. This study use landsat 1 MSS, Landsat 5 TM, Landsat 7 ETM+, Landsat 8 OLI/TIRS captured from 1972 to 2020 as main input. The images data are processed using the procedure of image treatment using open-source image processing software. In this case, the well-known pixel-based classification algorithm (i.e, gaussian maximum likelyhood classification) applies to procude LULC maps of 1972, 1997, 2002, 2017, and 2020. The LULC change is analysed by comparing the area extent of eight LULC classes (i.e., built-up (pavement) areas; paddy field; heterogeneous agricultural land; Dense vegetation; sparsely vegetation; barre land/sand/rock; shrubland; and water body. The results show that the pavement area change slightly increased from 1972 to 1997, and then exponentially increased from 1997 to 2020 by 7,5% per year. The rapid change in pavement areas shows how human activities influence the watershed during the last 30 years. This rapid change also affects significantly the area occupied for paddy fields and decrease proportionally the area occupied for heterogeneous agricultural land.

Keywords: *Land use, Land cover, Change, Landsat, Mayang, Watershed.*

Effects of Application Organic and NPK Inorganic Fertilizers on Soybean in Dry Land

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Abstract

Increasing soybean production in dry land can be done through intensification using organic and inorganic fertilizer. The research aimed at evaluating the effect of added organic and NPK inorganic fertilizer on soil and productivity of soybean in dry land. The experiment was arranged in a randomized complete block design with three replications on dry land in Gresik, East Java. The treatments evaluated were 12 combinations dosage of ZA (ammonium sulphate), SP-18 (super phosphate-18), KCl (potassium chloride), and chicken manure/ha. The study was conducted on dry land without and with 5,000 kg cow manure/ha. The soybean seed used in this research was Argomulyo. The results showed that application of 5,000 kg cow manure/ha increased the yield of Argomulyo soybean veriety by 0.21 t/ha (9%) and application of 100 kg KCl/ha + 50 kg ZA/ha + 100 kg SP-18/ha + 5,000 kg cow manure/ha, and 50 kg ZA/ha + 2,500 kg chicken manure/ha + 5,000 kg cow manure/ha increased 0.95-1.38 t/ha (50-74%) of soybean yield. The use of organic and inorganic fertilizer is an alternative technology that needed to maintain and increase the productivity of soybean and soils in dry land to support sustainable soybean cultivation.

Key words: *dry land, inorganic fertilizer, organic fertilizer, soil physical properties, soybean*

The effect of packaging and storage temperature to quality and shelf life of corn-egg roll

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Abstract

Corn egg roll is a popular traditional maize snack widely consumed among society. The high content of fat present in corn egg roll and it hygroscopic nature makes it susceptible to quality degradation during storage period. Quality degradation of corn egg roll occurs due to oxidation and hydrolysis reaction of fat which can cause rancidity in the product. Therefore, this product requires the right type of packaging and storage temperature to prevent product from quality degradation. This research was aimed to study the changes of corn-egg roll quality during storage, and to determine its shelf life. Corn-egg roll was packaged in aluminium foil and polypropylene, then stored in incubator at 30, 40 and 50°C. The analysis of egg roll was done every month for 4 months. The determination of shelf life was done using Accelerated Shelf Life Test method using Arrhenius approach. During storage, there is an increase in free fatty acid and moisture content, as well as a decrease in texture and aroma. The free fatty acid as the critical point of corn egg roll which is packed by polypropylene, while, the egg roll which is packaged by aluminium foil has aroma as a critical point. Corn egg roll packed in aluminium foil has a longer shelf life than polypropylene packaging. The shelf life of corn egg roll packed in aluminium foil at the storage temperature of 25, 28 and 30°C is 19.3; 18.5 and 18.1 months, while in polypropylene is 15.9; 15.5 and 15.2 months.

Key words: *aluminium foil; aroma; corn-egg roll; free fatty acid; polypropylene aluminium foil; aroma; corn-egg roll; free fatty acid; polypropylene*

Does The Rice Agroindustry In Dumai City Develop Based On Marketing Analysis?

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Abstract

Rice production which shows an increasing trend and the entry of quality rice from Rokan Hilir, Kampar, and Siak Regencies supports the availability of rice in Dumai City. However, most of the rice needs in Dumai City are still supported by outside the province of Riau. This condition creates opportunities for packaged rice agroindustry in Dumai City. The purpose of this study was to identify the origin of rice and to analyze the potential for developing packaged rice agroindustry in Dumai City based on marketing analysis. The research method used is a survey method to 20 respondents who were selected purposively based on the representation at each level of the marketing agency. The analytical method used is descriptive qualitative and descriptive quantitative. The results showed that the rice in the packaged rice agroindustry in Dumai City came from within and outside the province of Riau. Based on the marketing analysis, the rice agro-industry by Perum Bulog and CV ADAB belongs to the efficient marketing category with a total margin value below the selling price of rice, namely Rp. 6,100 and Rp. 1,350 and the value of marketing efficiency is below 100%, namely 10.35% and 2.9%. . ADAB's rice agroindustry with intermediary material in the form of quality rice from West Sumatra is considered to have more efficient marketing and has the potential to be developed in order to support regional rice availability.

Keywords: *rice, agroindustry, packaged rice, margin, marketing efficiency*