The 6th International Conferences on Agriculture and Life Sciences (ICALS)

ABSTRACT BOOK

Upgrading Industrial Agriculture Innovation to Actualize Food Sovereignty

Jember, East Java, Indonesia
July 30th - August 1st, 2024

ABSTRACT BOOK

THE 6th INTERNATIONAL CONFERENCE ON AGRICULTURE AND LIFE SCIENCE 2024

Jember, East Java, Indonesia
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FOREWORD FROM CHAIRMAN COMMITTEE ICALS 2024

Assalamualaikum Waraahmatullahi Wabarakatuh

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, 4th International Conference on Agriculture and Life Sciences (ICALS 2020) on 2020, and 5th International Conference on Agriculture and Life Sciences (ICALS 2021).

1. The ICALS is proudly co-organized with Faculty of Agriculture University of Jember, Graduate Program University of Jember. This conference will be hosted by the Faculty of Agriculture at Universitas Jember, supported enthusiastically by the Communication Forum of Indonesian Higher Education of Agriculture (FKPTPI) Eastern Region.
2. On this occasion, I would like to inform you that the event is included in a series of activities with two programs of international seminar programs in conjunction with the Communication Forum of Indonesian Higher Education of Agriculture (FKPTPI) Eastern Region workshop which starts tomorrow until the day after tomorrow. The International Seminar featured keynote speakers from the University of Jember and the Agricultural Education Center of the Agricultural Extension and Human Resource Development Agency (BPPSDMP). In addition, guest speakers and invitees from Korea, Philippines, Australia, and Indonesia will also participate in the conference to share their knowledge and expertise.

ICALS 2024 will be attended by a general audience from academics, researchers, students, farmers, private businesses, and government in Indonesia. From all the participants, academics and researchers will disseminate their research results related to this conference topic, “Upgrading Industrial Agriculture Innovation to Actualize Food Sovereignty”.

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 2024, without you,

ICALS 2024 will not be a reality. Representing the organizer, I proudly welcome all of you at ICALS 2024. Wishing all participants, fruitful and memorable experience for these two (2) days.

Thank you.
Wassalamualaikum Waraahmatullahi Wabarakatuh

Tri Wahyu Saputra, S.T.P., M.Sc.
The General Chairman of ICALS 2024

SCHEDULE OF ICALS 2024

"Upgrading Industrial Agriculture Innovation to Actualize Food Sovereignty"

Tuesday, July 30th, 2024. International Conference: Opening Ceremony, Plenary and Parallel Session

Location: Auditorium, University of Jember

Time (GMT+7)	Agenda	Venue	PIC
Tuesday, July 30th, 2024			
07.00 – 08.00	Registration	Auditorium University of Jember	Committee
08.00 - 08.10	Lahbako Dance 1. Lahbako dance explanation 2. Dance Performance		Narator UKM Panjalu
08.10 – 08.25	Opening Ceremony		MC
	1. Singing of national anthem 2. Singing Hymne UNEJ 3. Singing Agricultural Faculty Mars 4. Singing FKPTPI Mars		Committee dan Corus Rusticarum
08.25 - 08.30	Opening prayer		M. Nur Khozin
08.30 – 08.55	Welcome Remarks		
	1. Chairman's report (5') 2. Welcome Remarks by the Secretary General of FKPTPI/Welcome Remarks by the Chairman of FKPTPI Eastern Region (10') 3. Welcome Remarks and opening the seminar by the Rector of the University of Jember (10')		Tri Wahyu Saputra, S.T.P., M.Sc. Prof. Dr. Ir. A. Muslim M. Agr. / Ir. lily Ishak, M.Si., Nat. Res., Ph.D Dr. Ir. Iwan Taruna, M.Eng, IPM
08.55 – 09.20	Signing the Memorandum of Understanding (MoU) and Memorandum of Agreement (MoA)		Committee
09.20 - 09.25	Photo Session		MC
09.25 – 09.30	Next Session Preparation		Committee
09.30 – 09.55	Keynote Speaker: **Dr. Idha Widi Arsanti, SP, MP** **Head of Agricultural Education Center Agricultural Extension and Human Resource Development Agency (BPPSDMP)** Topic: Food Sovereignty		MC
09.55 – 10.00	Next Session Preparation		Committee
10.00 – 10.20	Guest Speaker 1: **Sung Keun Jung, PhD.** **Kyungpook National University (Republic of Korea)**		**Moderator 1** Hardian Susilo Addy, Ph.D.

Time (GMT+7)	Agenda	Venue	PIC
	Topic: Food Science and Biotechnology		
10.20 – 10.40	Guest Speaker 2: **Prof. Tri Agus Siswoyo, Sp, M.Agr., Ph.D** **University of Jember (Indonesia)** Topic: Biotechnology And Biomolecule		
10.40 – 10.55	Discussion/QA		
10.55 – 11.00	Next Session Preparation		
11.00 – 11.20	Guest Speaker 3: **Prof. Dr. Victor B. Asio** **College of Agriculture and Food Science, Visayas State University (Philippines)** Topic: Land Management dan Pedology for Strategy to Achieve Food Sovereignty		**Moderator 2** Joni Murti Mulyo Aji, Ph.D.
11.20 – 11.40	Guest Speaker 4: **Associate Professor Paul Nevill** **Curtin University (Australia)** Topic: Communication and art for sustainable food		
11.40 – 11.55	Discussion/QA		
11.55 – 12.00	Closing and Announcement for Parallel session and Gala Dinner		MC
12.00 – 13.00	Break/Lunch		Committee
Parallel session Schedule			
13.00 – 17.00	**Parallel session**	Auditorium University of Jember	
	Room 1: Agronomy and Plant Protection		Widya Kristianti Putri, S.Pd, M.Si.
	Room 2: Biotechnology and Biomolecule		Distiana Wulanjari, S.P., M.P.
	Room 3: Agricultural Engineering and Technology		Ika Purnamasari, S.Si., M.Si.
	Room 4: Food Science and Smart Education for Plant Based-Diet		Diah Ayu Savitri, S.TP., M.Agr.
	Room 5: Smart Social and Politics in Industrial Agriculture		Rizky Yanuarti, S.P., M.P.
	Room 6: Smart Business for Agriculture and Healthy Food		Susan Barbara Patricia, S.Hut., M.Sc.
	Room 7: Sustainability of Animal Husbandry and Feed Production		Himmatul Khasanah, S.Pt, M.Si.
17.00	Closing of Parallel Session and Announcement of Gala Dinner		MC
Gala Dinner Schedule			
18.30 - 19.00	Registration		Committee

Time (GMT+7)	Agenda	Venue	PIC
	Live Music	Auditorium University of Jember	Harmony Band
19.00 - 19.05	Opening of Gala Dinner		
19.05 – 19.15	Welcome Speech of Dean of Agricultural Faculty		Prof. Dr. Ir. Soetriono, M.P.
19.15 - 19.30	Special performances from Faperta Choir and Chorus Rusticarum		Faperta Choir and Chorus Rusticarum
19.30 - 19.40	Welcome Speech of Rector University of Jember		Dr. Ir. Iwan Taruna, M.Eng, IPM
19.40 - 20.30	Dinner		
	Live Music dan Special performances from Harmony Band		Harmony Band
20.30 – 20.50	Awarding and Announcement		Committee and MC
20.50 – 21.05	Reog Performance		UKM Reog
21.05 - 21.15	Closing Ceremony of the 6th ICALS and FKPTPI Workshop		Prof. Dr. Ir. Soetriono, M.P
21.15 - 21.25	Closing of Gala Dinner		MC

SCHEDULE OF PRESENTERS DURING PARALLEL SESSION

Time (GMT+7)	Program	Time (GMT+7)	Program
13.00 – 13.30	**Preparing for all presenter**	15.06 – 15 .30	**Coffee break**
13.30 – 13.42	Presenter 1	15.30 – 15.42	Presenter 9
13.42 – 13.54	Presenter 2	15.42 – 15.54	Presenter 10
13.54 – 14.06	Presenter 3	15.54 – 15.06	Presenter 11
14.06 – 14.18	Presenter 4	16.06 – 16.18	Presenter 12
14.18 – 14.30	Presenter 5	16.18 – 16.30	Presenter 13
14.30 – 14.42	Presenter 6	16.30 – 16.42	Presenter 14
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Agronomy and Plant Protection

STUDY OF SURJAN CROPPING SYSTEM BY THE APPLICATION OF A COMBINATION OF ENTOMOPATHOGENIC FUNGI WITH NANO EMULSIONS OF BOTANICAL PESTICIDES

Suharto[1]*, Wagiyana[1], Bakhroini Habriantono[1], Rachmi Masnilah[1], Mohammad Hoesain[1], Suhartiningsih Dwi Nurcahyanti[1], and Fariz Kustiawan Alfarisy[1]

[1]Department of Plant Protection, Faculty of Agriculture, University of Jember

*E-mail: harto.unej.faperta@unej.ac.id

ABSTRACT

The surjan system is one of the implementations of local wisdom in Kulonprogo, Yogyakarta Special Region. The aimed of this study is to examine the response of arthropod diversity in a surjan system with the combined application of entomopathogenic fungi and botanical pesticide nano-emulsions. This study was conducted in Lendah Village, Kulonprogo, Special Region of Yogyakarta. The research stages consist of rejuvenation and production of biological control agents made from the active ingredient *Beauveria bassiana*. The combination of applications uses a nano emulsion from botanical pesticides with the active ingredient neem leaves (*Azadiracta indica*). The treatment group consisted of control and sprayed. Arthropod observations were carried out by direct observation, using trapping and swept nets. The spore density used for entomopathogenic fungi (*B. basiana*) was 10^8 spores mL^{-1}. The results showed that the area where entomopathogenic fungi and nano emulsion were applied had a greater diversity of arthropods compared to the control treatment.

Keywords: Control, Crops, Insecticide, Integrated, and Modified

THE EFFECT OF FeCl2 AND ZnCl2 ON *Bacillus siamensis* ST4 AND *Bacillus amyloliquifaction* LB2 AS ANTAGONISTIC AGENTS

Suhartiningsih Dwi Nurcahyanti*, Ahmad Ilham Tanzil, Rachmi Masnilah, Desy Cahya Widyaningrum, Himmatul Khasanah, Vivi Fitriani, Fariz Kustiawan Alfarisy and Anggi Anwar Hendra Nurdika

Faculty of Agriculture, Jember University. Kalimantan St No.37 Jember, East Java, Indonesia

*E-mail: suhartiningsih.faperta@unej.ac.id

ABSTRACT

Bacillus siamensis ST4 and B. amyloliquifaction LB2 are antagonistic agents for controlling plant diseases isolated from the soybean phyllosphere. Bacterial growth is greatly influenced by nutrition consisting of macronutrients and trace elements. The elements Fe and Zn are trace elements that are needed by bacteria in very small amounts. This element is an enzyme activator which is needed in bacterial metabolism for its growth. This research aims to determine the effect of the elements Fe and Zn on the two Bacillus in relation to their potential as biological agents of plant diseases. The research was carried out with these treatments: Control (K): NB 100 ml, T1: NB 100 ml + FeCl2 40 mg/l, T2: NB 100 ml + FeCl2 45 mg/l, T3: NB 100 ml + ZnCl2 105 mg/l T4: NB 100 ml + ZnCl2 110 mg/l. The results of the study showed that trace elements: 1) did not affect the growth of the two Bacillus both in population and growth patterns, 2) ZnCl with a concentration of 110 mg/L was able to increase the antagonism of B. simanensis ST4 against Xanthomonas axonopodis by 23.94%, 3) reduced the ability of Bacillus to hydrolyze starch, 3) Fe and Zn levels tended to have no effect on the survival of the two Bacillus strains at varying pH conditions and NaCl levels, but increased survival at different temperatures except for ZnCl2 with a concentration of 105mg/L.

Keyword: Trace element, Bacillus, FeCl2, ZnCl2

STUDY OF EFICACY VARIOUS INSECTICIDE TO SILVERLEAF WHITEFLY (*Bemisia tabaci*)

Bakhroini Habriantono[1], Suharto[1], Wagiyana[1*], Rachmi Masnilah[1], Mohammad Hoesain[1], Suhartiningsih Dwi Nurcahyanti[1], and Fariz Kustiawan Alfarisy[1]

[1]Department of Plant Protection, Faculty of Agriculture, University of Jember

*E-mail: wagiyana.faperta@unej.ac.id

ABSTRACT

Tobacco crop are one type of superior plantation in Jember Regency. Tobacco has become a commercial product to increase economic and socio-cultural value for the society of Jember. The main problem for tobacco farmers is the whitefly (*Bemisia tabaci*) attack. Currently farmers still depend on insecticides. The aim of this study is to examine the efficacy of various active insecticide ingredients in controlling *B. tabaci*. The research was conducted at the Plant Protection Laboratory, Faculty of Agriculture, Jember University. The method used was direct spraying on *B. tabaci* imago. A total of 10 *B. tabaci* were placed in a modified testing box, then sprayed according to the treatment. The volume of the spray solution was 5 mL for each treatment and replication. The best treatment that can be applied to control *B. tabaci* is the T3A6 treatment (Kanon 0.4 mL L^{-1} + Citrole 0.6 mL L^{-1}).

Keywords: Control, Effectiveness, Management, Mortality, and Pest

IN VITRO STUDY OF BACTERIAL POTENTIALS AS BIOFERTILIZER AND BIOSTIMULANT AGENTS

Widi Amaria[1,2]*, Meity Suradji Sinaga[1], Kikin Hamzah Mutaqin[1], Supriadi[2], and Widodo[1]

[1]Department of Plant Protection, Faculty of Agriculture, IPB University, Jl. Kamper, Kampus IPB Dramaga, Bogor 16680, Indonesia
[2]Research Center for Estate Crops, Research Organization for Agriculture and Food, National Research and Innovation Agency, Jl. Raya Jakarta-Bogor KM 46 Cibinong, Bogor 16911, Indonesia

*E-mail: widi011@brin.go.id

ABSTRACT

Bacterial biocontrol agents (BCAs) have the potential to promote plant growth by increasing nutrient availability and stimulating hormones to enhance plant health. This study aimed to determine the potential of bacteria as biofertilizers and biostimulants that support plant growth. Ten bacteria of *Serratia surfantantfaciens*, *Brucella intermedia*, *Bacillus amyloliquefaciens*, *Bacillus albus*, and *Burkholderia cepacia* were tested for their biofertilizer potential by assessing their ability to solubilize phosphate in Pikovskaya medium, solubilize potassium in Aleksandrov medium, and fix nitrogen in nitrogen-free bromthymol blue (NFB) semi-agar medium. Subsequently, bacteria as biostimulants were evaluated by measuring their production of phytohormones, including indole acetic acid (IAA), gibberellins (Ga3), and cytokinins, using High-Performance Liquid Chromatography. Additionally, the bacteria were examined for their effect on seed germination using the ragdoll method by measuring root and shoot lengths and calculating the germination percentage. The results showed that the ten bacteria tested had the potential to produce phytohormones. Three bacteria produce IAA above 8 mg L^{-1}, while eight produce Ga3. However, the bacteria produced lower levels of cytokinins (zeatin and kinetin), below 5 mg L^{-1}. Biofertilizer activity revealed that five bacteria exhibited three activities: phosphate solubilization, potassium solubilization, and nitrogen fixation. *S. surfactantfaciens*, *B. intermedia*, and *B. amyloliquefaciens* positively impacted the germination of chilli and kale seeds. These findings suggest that bacterial BCAs have the potential to serve as effective biofertilizers and biostimulants, enhancing their role as plant growth promoters and supporting plant health.

Keywords: Bacterial Biocontrol Agents, Phytohormones, Phosphate Solubilization, Potassium Solubilization, Nitrogen Fixation

EVALUATING LIGNIN'S ROLE IN ENHANCING COCOA (*Theobroma cacao* L.) LEAF RESISTANCE TO PHYTOPHTHORA PALMIVORA

Asif Aunillah[1], Sri Widiya Ningsih[2], Hasim[2], Khaerati[3], Cici Tresniawati[4], and Nur Kholilatul Izzah[4]*

[1]Research Center for Agroindustry, National Research and Innovation Agency, Jl. Raya Jakarta-Bogor Km. 46 Cibinong Bogor, 16911, West Java, Indonesia
[2]Biochemistry Department, Faculty of Mathematics and Natural Sciences, IPB University, Gd. FMIPA Jl. Meranti Kampus Dramaga Bogor 16680
[3]Indonesian Industrial and Refreshing Plants Instrument Standard Testing Institute, Ministry of Agriculture, Jl. Raya Pakuwon Km. 2, Parungkuda, Sukabumi, West Java 43357, Indonesia
[4]Research Center for Estate Crops, National Research and Innovation Agency, Jl. Raya Jakarta-Bogor Km. 46 Cibinong Bogor, 16911, West Java, Indonesia

*E-mail: nur.kholilatul.izzah@brin.go.id

ABSTRACT

Improper application of good agricultural practices (GAP) can lead to increased vulnerability of cocoa plants (*Theobroma cacao L.*) to attacks by *Phytophthora palmivora*. *P. palmivora* is a pathogen that causes black pod disease. Chemical fungicides are often used to reduce these attacks. However, this method has a detrimental impact on humans. One efficient method is to use cocoa cultivars resistant to *P. palmivora*. A component of cocoa leaves, lignin, has antioxidant properties and inhibits cell-damaging enzyme activity. The research aimed to understand how lignin levels correlate with the plant's ability to withstand *P. palmivora* attacks. The results indicated a positive but insignificant correlation between lignin content in healthy and diseased leaves and resistance to *P. palmivora*. This implies increased lignin content in healthy leaves will decrease the likelihood of *P. palmivora* attack. In contrast, lower levels of lignin in healthy leaves will increase the possibility of *P. palmivora* assaults. Conversely, the study found that water content, extractive substances, and hemicellulose content in the leaves exhibited a negative but insignificant correlation with resistance to *P. palmivora*. These findings suggest that while lignin, cellulose, and ash content may play a role in cocoa leaf resistance to *P. palmivora*, their impact is not statistically significant.

Keywords: Cocoa, Phytophthora Palmivora, Endurance, Lignin

APPLICATION OF TRICHODERMA SP. IN FORMULATION FOR CONTROLLING DISEASE DAMPING OFF MADURA 3 CORN VARIETY

Ali Wafa[1,2]*, Damaita Afriana[1], Hardian Susilo Addy[1,2], Sigit Prastowo[1,2], Himmatul Khasanah[2,3], Desy Cahya Widianingrum[2,3], Erlia Narulita[2,4], Ahmed Ibrahim Alrashid Yousif[6, 7] and Saiful Khoiri[5]

[1]Plant Protection Study Program, Faculty of Agriculture, University of Jember, Indonesia
[2]Applied Molecular and Microbial Biotechnology (AM2B) Research Group, University of Jember, Jawa Timur, 68121, Indonesia
[3]Animal Husbandry Study Program, Faculty of Agriculture, University of Jember, Bondowoso Campus, Jawa Timur, 68250, Indonesia
[4]Biological Education Study Program, Faculty of Educational Program, University of Jember, Jawa Timur, 68121, Indonesia
[5]Agrotechnology Study Program, Faculty of Agriculture, Trunojoyo Madura University, Bangkalan Indonesia
[6]Department of Integrated Plant Protection, Plant Protection Institute, Hungarian University of Agriculture and Life Sciences (MATE), 2100 Gödöllő, Hungary.
[7]Department of Plant Protection, Omdurman Islamic University,11111, Alfetehab, Omdurman, Sudan.

*E-mail: ali.wafa@unej.ac.id

ABSTRACT

Damping off is a disease that attacks the roots, causing stem base rot, occurring at *pre-emergence* and *post-emergence* stages. *Trichoderma* sp., is widely used in controlling soil borne pathogens. The Madura 3 corn variety used was developed by Trunojoyo University and produced by PT. GARS. In making the *Trichoderma* sp. formulation, *Trichoderma* isolated that have grown on corn rice media are used and then mixed with materials such as kaolin, CMC, dextrose, talc, and yeast, affecting antagonistic power. The application of *Trichoderma* sp. formulation is also able to symbiotically interact with plant roots, affecting germination, height, and number of leaves, as well as controlling and suppressing pathogen infection attacks, specifically disease severity. The results found that *Fusarium oxysporum* caused damping off disease in the *pre-emergence* stage and *post-emergence* stage in Madura 3 corn variety.

Keywords: Damping off, *Trichoderma* sp., formulation, corn variety Madura 3

EVALUATING THE POTENTIAL OF *Serratia*, *Brucella*, *Bacillus*, AND *Burkholderia* AS PLANT GROWTH-PROMOTING AGENTS

Widi Amaria[1,2]*, Meity Suradji Sinaga[1], Kikin Hamzah Mutaqin[1], Supriadi[2], and Widodo[1]

[1]Department of Plant Protection, Faculty of Agriculture, IPB University, Jl. Kamper, Kampus IPB Dramaga, Bogor 16680, Indonesia
[2]Research Center for Estate Crops, Research Organization for Agriculture and Food, National Research and Innovation Agency, Jl. Raya Jakarta-Bogor KM 46 Cibinong, Bogor 16911, Indonesia

*E-mail: widi011@brin.go.id

ABSTRACT

Bacterial biocontrol agents (BCAs) have the potential to promote plant growth by increasing nutrient availability and acting as biostimulants to enhance plant health. This study aimed to evaluate the potential of bacterial BCAs as biofertilizers and biostimulants that support plant growth. Ten bacterial BCAs frm *Serratia surfantantfaciens*, *Brucella intermedia*, *Bacillus amyloliquefaciens*, *Bacillus albus*, and *Burkholderia cepacia* were tested for their biofertilizer potential by assessing their ability to solubilize phosphate in Pikovskaya medium, solubilize potassium in Aleksandrov medium, and fix nitrogen in nitrogen-free bromthymol blue (NFB) semi-agar medium. The potential of these bacteria as biostimulants was evaluated by measuring their production of phytohormones, including indole acetic acid (IAA), gibberellins (Ga3), and cytokinins, using High-Performance Liquid Chromatography. Additionally, the bacteria were examined for their effect on seed germination using the ragdoll method by measuring root and shoot lengths and calculating the germination percentage. The results showed that the ten bacterial tested had the potential to produce phytohormones. Three bacterial produce IAA above 8 mg L^{-1}, while eight produce Ga3. However, the bacteria produced lower levels of cytokinins (zeatin and kinetin), below 5 mg L^{-1}. Biofertilizer activity revealed that five bacteria exhibited three activities: phosphate solubilization, potassium solubilization, and nitrogen fixation. *S. surfactantfaciens*, *B. intermedia*, and *B. amyloliquefaciens* positively impacted the germination of chili and kale seeds. These findings suggest the bacterial BCAs have the potential to serve as effective biofertilizers and biostimulants, enhancing their role as plant growth promoters and supporting plant health.

Keywords: Bacterial Biocontrol Agents, Phytohormones, Phosphate Solubilization, Potassium Solubilization, Nitrogen Fixation

BIODIVERSITY COFFEE LEAFMINER AND ITS PARASITOIDS

Hari Purnomo[1]*, Wildan Muchlison[1], Irwanto Sucipto[1] and Abdurrahman Shaleh[4]

[1]University of Jember

*E-mail: Haripurnomo.faperta@unej.ac.id

ABSTRACT

Coffee leafminer was first reported by extention worker that attack arabica coffee in Bremi village, Probolinggo regency. Most coffee plant was defastated by leafminer infestation the objective of this research was to identify coffee leafminer species and its parasitoids at two location Bremi and Watu Panjang. The results showed that population of the arabica coffee leafminer and its parasitoids was higher in Watu Panjang village than in Bremi village. The parasitoid found were from the genera Orgilus, Opius and Horismenus. The highest population of parasitoids was obtained by the genus Horismenus white the lowest population wa the genus Orgilus which was found in Bremi and Watu Panjang village

Keywords: Coffee, Leafminer, Hymenoptera Parasitoid

PROPAGATION OF THE *DENDROBIUM* ORCHID THROUGH SOMATIC EMBRYOGENESIS (SE) IN THE PROLIFERATION STAGE USING NAA AND TDZ

Parawita Dewanti[1]*, Laily Ilman Widuri[2], Feby Merdika Ananda,[3] and Firdha Narulita Alfian[4]

[1]Departement of Agronomy, Faculty of Agriculture, University of Jember, Jember, Indonesia.
[2]Master Program of Agronomy, Faculty of Agriculture, University of Jember, Jember, Indonesia.
[3] Agrotechnology study program, Faculty of Agriculture, University of Jember, Jember, Indonesia.
[4]Biotechnology master program, Faculty of Agriculture, University of Jember, Jember, Indonesia

*E-mail: parawita.faperta@unej.ac.id

ABSTRACT

Orchid *Dendrobium* is an ornamental plant that easily adapts to the environment and has flowers that vary in shape, color, and size. Somatic embryogenesis is a tissue culture technique currently considered the most appropriate to increase the production of high-quality orchid seedlings. This study aimed to obtain the best combination of NAA and TDZ on the somatic proliferation of *Dendrobium* orchid embryogenesis in forming globular, scutellar and coleoptilar structures in somatic embryogenesis stages. The results showed that the best combination of NAA and TDZ in the N2T3 medium treatment (0.2 mg/L NAA + 0.4 mg/L TDZ) gave the best response in forming globular with the fastest average time of 3 days, forming scutellar with the fastest average time of 6 days, and coleoptilar with a mean of 20 days.

Keywords: Auxin, Cytokinin, Multiplication, Ornamental Plant, Tissue Culture

ROLE OF DOLOMITE, CHICKEN MANURE, LIQUID ORGANIC FERTILIZER IN INCREASING THE YIELD OF MUNG BEAN ON ULTISOL

Syamsu Alam[1]*, Ririn Ameliasari Indriastuti Sunarto[2], Nini Mila Rahni[2]

[1]Department of Soil Science and [2] Department of Agrotechnology, Faculty of Agriculture, Universitas Halu Oleo Kendari 93232 Southeast Sulawesi Indonesia

*E-mail: alamhaluoleo@gmail.com

ABSTRACT

The decline in mung bean production is partly due to low soil fertility such as Ultisol soil. Increasing growth and production can be done through the provision of soil conditioners in the form of dolomite lime and the addition of organic materials in the form of solid organic fertilizer and liquid organic fertilizer. The purpose of this study was to analyze the response and determine which treatment had a better effect on the application of dolomite lime, chicken manure and liquid organic fertilizer (LOF) of gamal leaf extract and papaya fruit on the growth and production of mung bean plants on Ultisol. This research was conducted at the Field Laboratory II Faculty of Agriculture, Halu Oleo University, from July to September 2023. This research method used a Randomized Block Design (RBD) consisting of seven treatments and three replications. Data were analyzed using analysis of variance followed by Duncan Multiple Range Test (DMRT) at the $\alpha = 0.05$ level. The results showed that the application of dolomite lime, chicken manure and LOF gamal leaf extract and papaya fruit on Ultisol had a very significant effect on all variables, namely plant height (14, 28 and 42 DAP), number of leaves (14, 28 and 42 DAP), stem diameter (14, 28 and 42 DAP), leaf area (14, 28 and 42 DAP), flowering age, harvest age, root volume, number of root nodules, pupus dry weight, root dry weight, plant dry weight, root pupus ratio, number of pods per plant, pod weight per plant, seed weight per plant and 100 seed weight per treatment. The results of the DMRT analysis showed that treatment G (dolomite lime + chicken manure + LOF gamal leaf extract and papaya fruit) was the best treatment for the growth and production of mung bean plants on Ultisol.

Keywords: Chicken Manure, Dolomite Lime, Liquid Organic Fertilizer, Mung Beans, Ultisol

ABILITY OF BULULAWANG MUTANT SUGARCANE PLANTS AND PLANTS TO GROWTH AND YIELD USING *ETHYL METHANE SULPHONATE* (*EMS*)

Almaidah Ilmi Sufaningtyas[1]*, Sri Hartatik[1], Mohammad Nur Khozin[1] and Kacung Hariyono[1]

[1]University of Jember

*E-mail: almailmi20@gmail.com

ABSTRACT

The current problem is the lack of sugar production in Indonesia, while the demand for sugar is increasing. This research uses superior varieties of sugarcane plants from research that has been conducted by the research group of the plant cultivation team at the University of Jember to produce mutase sugarcane Bululawang varieties using Ethyl Methane Sulphonate (EMS). The purpose of this study was to determine the cracking resistant sugarcane plants using the superior Bululawang sugarcane variety EMS results to determine the interaction of the two. This research used a factorial Randomised Group Design (RAK) with four replications. The first factor consisted of 3 factors with the first factor of sugarcane (K1, K2, and K3) and the second factor of mutant sugarcane (M1 (BL non mutant), M2, M3, and M4), so there were 12 treatment combinations with 4 replications. Observation parameters included growth and yield variables, namely brix, pol, sugar content, and sugar yield. Data were then analysed using ANOVA variance analysis, if there was a significant difference, followed by 95% DMRT test. There was a very significant difference in both factors on the growth and yield variables of sugarcane plants. Sugarcane mutations resistant to cracking up to K3 and M4 have the highest yield of 11.91%.

Keywords: Ratoon, Mutated Sugarcane, Sugar Content, EMS

EDAMAME SEED MATRICONDITIONING USING MYCORRHIZA TO OVERCOME SALINITY STRESS

Indri Fariroh[1]* and Didik Pudji Restanto[1]

[1]Agronomy, Faculty of Agriculture, University of Jember, Jember, Indonesia

*E-mail: indrifariroh@unej.ac.id

ABSTRACT

One of the problems in edamame production is high loss of yield due to high content of protein and water, so it is vulnerable to damage during harvest. Increasing the edamame production can be attempted by expanding the planting area in marginal land such as saline soil. Seed matriconditioning using mycorrhiza can be used as solution to improve seed quality and overcome the plant stress in saline soil so the edamame production will be increased. This research used factorial randomized complete block design, i.e., seed mycorrhiza application (0 and 12 g/mg) and growing media (soil, saline soil, soil + saline soil (1:1)), with 3 replicates. The observation parameters were plant height (cm), root volume (ml), number of pods per plant, weight of pod per fruit (g), number of seeds per plant, and weight of 100 seeds (g). Data were analyzed using ANOVA, the treatment which is showed significant effect then tested using Duncan Multiple Range Test at α = 5%. The result showed that plant height in one week after planting (11.2 cm), root volume (25.2 ml), number of pods per plant (38.3 pods), weight of pod per fruit (2.15 g), number of seeds per plant (63.8 seeds), and weight of 100 seeds (38.3 g) in plant with mycorrhiza seed matriconditioning better than non-mycorrhiza seed in all growing media type.

Keywords: Edamame, Mycorrhiza, Saline Soil, Seed Matriconditioning, Seed Priming

REPLICATION OF LEEK CULTIVATION TECHNOLOGY (ALLIUM PORRUM) IN MALANG REGENCY

Oria Alit Farisi[1]*, Soetriono[2], Andhika Paratama Herlambang[3], Basuki[4], Dimas Bastara Zahrosa[2], Uyun Erma Malika[5], Rita Hanafie[6], Bakhroini Habriantono[7], Ariq Dewi Maharani[8] & Mohammad Alaika Nurul Hak[9]

[1]Agricultural Science Study Program, Faculty of Agriculture, University of Jember, Kalimantan Street, Jember, East Java, 68121, Indonesia.
[2]Agribusiness Study Program, Faculty of Agriculture, University of Jember, Kalimantan Street, Jember, East Java, 68121, Indonesia.
[3] Regional Development Planning Agency of East Java Province.
[4]Soil Science Study Program, Faculty of Agriculture, University of Jember Kalimantan Street, Jember, East Java, 68121, Indonesia.
[5]Study program Agribusiness Management, Faculty Agribusiness Management, State Polytechnic Institute Jember, Mastrip Street, 68121, Jember, East Java, Indonesia.
[6]Agribusiness Department, Faculty of Agriculture, Widyagama Malang University, Borobudur Street, Malang, East Java, 65128, Indonesia.
[7]Plant Protection Study Program, Faculty of Agriculture, University of Jember, Kalimantan Street, Jember, East Java, 68121, Indonesia.
[8]Agribusiness Department, Faculty of Agriculture, Widyagama Malang University, Borobudur Street, Malang, East Java, 65128, Indonesia.
[9]Master's student in Agronomy, Faculty of Agriculture, University of Jember, Kalimantan Street, Jember, East Java, 68121, Indonesia.

*E-mail: oriafarisi@unej.ac.id

ABSTRACT

The master plan for the development of agricultural areas in East Java serves as a blueprint for accelerating the growth of agricultural development in the region. The aim of this study was to evaluate the application of organic matter to address soil fertility decline due to low organic carbon levels in leek plants. The research was conducted in Duwet Krajan Village, Tumpang District, Malang Regency, from February to August 2022. The study consisted of 9 treatments applied per plant: control (A), local recommendation (B), 100% NPK (C), 6 tons/ha organic fertilizer + 50% NPK (D), 6 tons/ha organic fertilizer + 75% NPK (E), 6 tons/ha organic fertilizer + 100% NPK (F), 8 tons/ha organic fertilizer + 50% NPK (G), 8 tons/ha organic fertilizer + 75% NPK (H), and 8 tons/ha organic fertilizer + 100% NPK (I). The research parameters observed included plant height, number of leaves per clump, number of tillers per clump, stem diameter, root length, wet weight per plant, plant weight per clump, yield per hectare, protein content, moisture content analysis using the oven method, carbohydrates, chlorophyll content, and flavonoid content. The conclusions derived from this study indicate that increasing soil organic matter directly impacts the efficiency of fertilizers applied to the soil and can enhance the growth and yield of leek plants. This is demonstrated by treatment D (6 tons/ha organic fertilizer + 50% NPK), which increased the production weight of leeks per plant by 655 g, the weight of leeks per treatment by 529 kg, and the weight of leeks per hectare by 15.5 tons/ha.

Keywords: Leek, Organic Fertilizer, NPK

INDUCTION AND REGENERATION OF TOBACCO CALLUS USING BENZYL AMINOPURINE (BAP) AND FURFURYL AMINOPURINE (KINETIN) WITH THIN CELL LAYER (TCL) TECHNIQUE

Mohammad Nur Khozin[1]*, Muhammad Dima Say Mona[1]

[1]Agronomy Department, Agriculture Faculty, University of Jember 1

*E-mail: nurkhozin@unej.ac.id

ABSTRACT

Tobacco was a high-value crop that required effective and efficient cultivation methods to produce quality seedlings. This study aimed to enhance the efficiency of tobacco cultivation through tissue culture using the Thin Cell Layer (TCL) method. The research was conducted at the Tissue Culture Laboratory of the Faculty of Agriculture, University of Jember, from January to March 2024. Leaf bud explants of the Broadleaf One-Sucker tobacco variety were planted on Murashige & Skoog (MS) media with various concentrations of BAP (0, 2, 3, 4 ppm) and Kinetin (0, 3, 4 ppm). The study employed a Completely Randomized Design (CRD) and was analyzed using SPSS 25 and Microsoft Excel. Callus color analysis used the Munsell Color Chart, and the visual appearance and morphology of the callus were analyzed using a scanning electron microscope (SEM). The results showed that 3 ppm BAP was the best concentration for inducing callus in tobacco, with the callus appearing 10.78 days after planting (DAP) and explants sprouting within 8.3 DAP, producing 81.3 shoots. Visual observations indicated that the combination of 3 ppm BAP and 4 ppm Kinetin (P2M2) produced green callus with a compact texture, suitable for shoot formation. The green color of the callus indicated chlorophyll content, which was important for photosynthesis and shoot growth.

Keywords: Tobacco, Callus, NAA, BAP, TCL

MAXIMIZING RAMIE (*BOEHMERIA NIVEA*) YIELD: OPTIMIZING FERTILIZER EFFICIENCY THROUGH DIVERSE FERTILIZERS AND MULCHING STRATEGIES

Sugeng Winarso[1]*, Rendy Anggriawan[2,3], Kęstutis Romaneckas[3]

[1,2]Department of Soil Science, Faculty of Agriculture, University of Jember, Indonesia
[3]Department of Agroecosystem and Soil Science, Vytautas Magnus University, Lithuania

*E-mail: winarsosugeng@unej.ac.id

ABSTRACT

Ramie (*Boehmeria nivea*) is a natural fiber-producing plant whose fiber productivity in Indonesia has decreased due to the lack of superior varieties and soil degradation. This research aims to determine the effect of a combination of organic fertilizer and plastic mulch on soil chemical properties, growth, and yield of hemp fiber. Two treatment factors, a combination of fertilizer and a mulch factor, were carried out using a randomized block design setting. We proved that the recommended mulch and fertilizer treatment increased soil N-total availability by 76.47%. The available P variable can be increased by 27.58% using treatment without mulch and a combination of organic fertilizers. This can also increase the K-exchangeable value of the soil two times greater than the control, as well as C-organic by 7%, followed by an increase in hemp biomass, yield, and china grass, and wet weight of hemp by 95%. The greatest effectiveness of the various fertilizer combinations on the dry weight of ramie plants was achieved by the treatment combination of standard recommended fertilizer and organic fertilizer. The provision of mulch is very significant for the parameters observed; however, if treatment without mulching is applied, this will only be effective if fertilizer is applied to the soil with a combination of organic materials.

Keywords: Boehmeria Nivea, Nitrogen, K-Exchangeable, Available P, Organic Fertilizer

YELLOW ORCHID BEETLE (*OULEMA SP.*) THE KEY PEST OF ORCHID AND CONTROL POTENTIAL USING ENTOMOPATHOGENIC FUNGI

I Putu Sudiarta[1]*, Gusti Ngurah Alit Susanta Wirya[1], and Dewa Gede Wiryangga Selangga[1]

[1]Faculty of Agriculture, Udayana University

*E-mail: putusudiarta@unud.ac.id

ABSTRACT

Orchid is one of ornamental plant with high economical value, however is very difficult to grow of its and need special treatment including protection from pest and diseases. This research was conducted to know the pest of orchid and explored the entomopathogenic fungi as the natural enemies of its. One of importance pest was found is Yellow Orchid Beetle (*Oulema* sp.). *Oulema* sp. attack flower of many of orchids genera especially Vanda, Dendrobium, Aerides, Arachnis, Epidendrum, and Rhynchostylis. The larva feeds immediately upon emergence of flower as the food. It is very easy to recognize the larva of Yellow Orchid Beetle because the larva covered with slimy exudation and fecal materials with white color. In pupation stage, the mature larva excretes a meringue-like substance for its cocoon. The imago with yellow color also feed the flower of orchid as a food. The damage of orchid flower make the quality of orchid will be significant reduce. Therefore the necessary approach is needed to control Yellow Orchid Beetle. The possible control of Yellow Orchid Beetle with environmental friendly is using natural enemies including entomopathogenic fungi. The result of this research was collected one of entomopathogenic fungi from infected larva Yellow Orchid Beetle is *Beauveria* sp. The identification of *Beauveria* was conducted by morphological and molecular characterization. The future consideration is using *Beauveria* to control Yellow Orchid Beetle.

Keywords: Biological Control, Insect Pathogen, Orchid Pest

AGRONOMIC CHARACTERS OF 1000 GRAIN WEIGHT IN F1 PLANTS FROM CROSSING LOCAL BLACK RICE PURWOKERTO WITH GLUTINOUS RICE VARIETY PAKETIH.

Ummi Sholikhah[1]*, Ilham Mujahidin[1], Wahyu Indra Dwi Fanata[1], Tri Ratnasari[1], Ahmad Ilham Tanzil[1]

[1]Agrotechnology, Agriculture Faculty, University of Jember, Jl. Kalimantan No. 37, Kampus Tegalboto, Jember 68121, Indonesia

*E-mail: ummisholikhah.faperta@unej.ac.id

ABSTRACT

Black rice is a functional food ingredient due to its high anthocyanin content, which is beneficial for health. However, local black rice has several weaknesses such as deep age, high plant size, and low productivity. Efforts can be made to improve local black rice by crossing with superior varieties. One of the superior varieties is the glutinous rice variety Paketih. 1000-grain weight is an agronomic character that describes the size of rice grains. The data obtained were analyzed using independent sample T-test. The results showed that the average weight of 1000 grains of F1 plants was higher than glutinous rice of Paketih variety and lower than local black rice of Purwokerto.

Keywords: Black Rice, Crossing, 1000-Grain Weight

THE EFFECT OF NUMBER OF NODES AND AUXIN CONCENTRATION AND SHALLOT EXTRACT ON THE GROWTH PARAMETER OF VANILLA CUTTINGS (Vanilla Planifolia Andrews)

Sholeh Avivi[1]*, Raffi Achmad Susongko[1], Oria Alit Farisi[1], Dwi Erwin Kusbianto[1], Muhammad Ubaidillah[2] dan Sri Hartatik[3]

[1]Agriculture Study Program, Faculty of Agriculture University of Jember
[2]Agrotechnology Study Program, Faculty of Agriculture University of Jember
[3]Agronomy Study Program, Faculty of Agriculture University of Jember

*E-mail: savivi.faperta@unej.ac.id

ABSTRACT

Vanilla propagation is generally done using cuttings. Plant Growth Regulators (PGR) are organic compounds that can accelerate or decelerate the growth and development of plants. The aim of this study is to determine the effect of the number of nodes and the concentration of auxin and shallot extract on the roots of vanilla cuttings (Vanilla planifolia Andrews). This research was conducted in Pesanggaran Village, Pesanggaran Subdistrict, Banyuwangi Regency, from November 2023 to March 2024. The experimental design used in this study was a randomized block design (RBD) consisting of 2 factors and 3 groups. The number of nodes factor consisted of 4 levels: 3 nodes (R1), 4 nodes (R2), 5 nodes (R3), and 6 nodes (R4), while the auxin concentration factor consisted of 5 levels: 25 mg/1.5 Rootone F (H1), 22 ml shallot extract (H2), 25 mg/1.5 Rootone F + 22 ml shallot extract (H3), 50 mg/1.5 Rootone F + 22 ml shallot extract (H4), and 75 mg/1.5 Rootone F + 22 ml shallot extract (H5). The conclusions drawn from this study are: (1) The interaction between the number of nodes and the concentration of auxin and shallot extract had no significant effect on all observed variables, (2) The treatment of the number of nodes significantly affected the variables of sprout emergence time (R2), node emergence time (R1), wet weight of the shoots, and dry weight of the shoots (R3), (3) The concentration of auxin and shallot extract significantly affected the variables of sprout length (H1), stem diameter (H3), sprout emergence time (H3), plant height (H3), and dry weight of the shoots (H1).

Keywords: Vanilla, Number of Nodes, Rootone F, Shallot Extract

GROWTH OF CACAO SEEDLINGS AFTER A COMBINATION OF COCONUT WATER SOLUTION AND ONION EXTRACT TREATMENT

Sholeh Avivi[1]* Bantara Pelusa Sujanarko[1]. Gatot Subroto[1], Dyah Ayu Savitri [1], Muhammad Ubaidillah[2], and Sri Hartatik[3]

[1]Department of Agricultural Science, University of Jember.
[2]Departement of Agrotechnology, University of Jember
3Department of Agronomy, University of Jember

*E-mail: savivi.faperta@unej.ac.id

ABSTRACT

Cacao productivity in Indonesia has gradually decreased every year. According to data from BPS (2022), there were 275,730 cacao plants that were no longer productive in 2021. Cacao plants that reach the age of 25-30 years will experience a decline in productivity. Efforts to address this issue involve replacing old plants with new ones. The aim of this research is to determine the interaction between the application of coconut water solution and onion extract on the growth of cacao seedlings. The experiment was conducted using a completely randomized design (CRD) factorial consisting of 2 factors with 3 replications. The first factor is K0 = without coconut water; K1 = 40% coconut water; K2 = 60% coconut water; and K3 = 80% coconut water, while the second factor is T0 = without onion extract; T1 = 40% onion extract; T2 = 60% onion extract; and T3 = 80% onion extract. The results of the research are: (1) the interaction between the application of coconut water solution and onion extract significantly affected plant height, stem diameter, and root length with the best treatment being K2T2 (coconut water solution 60% and onion extract 60%); (2) the effect of coconut water solution significantly affected root dry weight with the best treatment being K1 (coconut water solution 40%); and (3) the effect of onion extract significantly affected shoot dry weight with the best treatment being T1 (onion extract 40%).

Keywords: Coconut Water, Onion Extract, Growth

THE EFFECT OF *Pseudomonas aeruginosa* A08 POPULATION DENSITY ON WEED SUPPRESSION AND THE GROWTH AND YIELD OF CORN (*Zea mays* L.)

Tresjia Corina Rakian[1]*, Gusti Ayu Kade Sutariati[1], Nini Mila Rahni[1], Makmur Jaya Arma[1], Muhidin[1] dan Waode Siti Anima Hisein[1]

[1]Department of Agrotechnology, [5] Department of Plant Protection, Faculty of Agriculture, Halu Oleo University, HEA. Mikodompit Street, Anduonohu Kendari

*E-mail: tresjia.corina.rakian_faperta@uho.ac.id

ABSTRACT

Corn is an important food crop, but its production in Southeast Sulawesi is still relatively low. This is due to the presence of weeds in cornfields. One effort to inhibit weed growth is to use deleterious rhizobacteria as a biological agent. The mechanism of deleterious rhizobacteria in infecting weeds includes the production of hydrogen cyanide and their role in nitrogen fixation, phosphate solubilization, and the production of indole acetic acid, which can enhance plant growth and yield. This study aims to determine the effect of *Pseudomonas aeruginosa* A08 rhizobacteria at various densities as a bioherbicide and growth promoter for corn plants. The research was conducted in the Agronomy Unit Laboratory of the Department of Agrotechnology and the Field Laboratory of the Faculty of Agriculture, Halu Oleo University. This study used a Randomized Block Design, testing the optical density (OD) of *P. aeruginosa* with four treatments: no rhizobacteria (R0), 1.0 OD *P. aeruginosa* A08 (R1), 1.5 OD *P. aeruginosa* A08 (R2), and 2.0 OD P. aeruginosa A08 (R3). Data were analyzed using analysis of variance followed by the Honest Significant Difference (HSD) test at a 95% confidence level. The results showed that *Pseudomonas aeruginosa* A08 rhizobacteria at various population densities had a significant effect on plant height, number of leaves, leaf area, dry seed weight per plant, and productivity (tons per hectare) and could suppress weed growth. The 1.5 OD P. aeruginosa A08 treatment was the best in suppressing weed growth in cornfields and could increase corn productivity by up to 95.40%.

Keywords: Deleterious Rhizobacteria, Weeds, Corn, Pseudomonas Aeruginosa

ANALYSIS OF POPULATION PROPORTIONS OF GREEN MUSTARD (*Brassica juncea* L.) INTERCROPPED WITH GAMBAS (*Luffa acutangula*) TO INCREASE THE YIELD IN PEATLANDS

Sylvianoor Milla Wati [1], Bambang Fredrickus [2], and Dewi Erika Adriani[2]*

[1]Master Program of Agronomy, Lambung Mangkurat University, Banjarbaru Indonesia
[2]Faculty of Agriculture, Lambung Mangkurat University, Banjarbaru, Indonesia

*E-mail: dewi.erika.adriani@ulm.ac.id

ABSTRACT

Vegetables are one of the horticultural commodities that fulfill the need for calories, vitamins, minerals, and fiber, for example green mustard and gambas. The increase of vegetable crop production could be achieved by optimizing land use through intercropping. This study aimed to analyze the difference of monoculture compared to the intercropping system and to determine the best proportion of green mustard population that can increase the yield of mustard and gambas in the intercropping system on peatland. The research used a randomized group design with five replications. The factor studied was the proportion of green mustard plants intercropped with gambas plants, namely: j_1 = Monoculture of green mustard spacing 20 cm x 20 cm, j_2= Green mustard spacing 30 cm x 20 cm intercropped with gambas spacing 40 cm x 200 cm, j_3= Green mustard spacing 40 cm x 20 cm intercropped with gambas spacing 40 cm x 160 cm, j_4= Green mustard spacing 50 cm x 20 cm intercropped with gambas spacing 40 cm x 120 cm, and j_5= Monoculture of gambas spacing 40 cm x 80 cm. The results confirmed that gambas fruit fresh weight and green mustard fresh weight per plant was better in intercropping system, however, the yield of these two crops was greater in monoculture. The green mustards which were planted at spacing 30 cm x 20 cm intercropped with gambas spacing 40 cm x 200 cm, was the best proportion in intercropping in peatland compared to others population proportion.

Keywords: Leafy Vegetables, Fruity Vegetables, Polyculture, Wetlands

GROWTH RESPONSE AND YIELD OF LOCAL GOGO RICE DONGAN CULTIVARS GIVEN NPK FERTILIZER AND LIQUID ORGANIC FERTILIZER (POC)

Sakka Samudin[1]*, Maemunah[1], Jusriadi[1], Mustakim[2] and Sigit Fajar A. Yama[3]

[1]Agrotechnology Study Program, Faculty of Agriculture, Tadulako University, Jln Soekarno-Hatta KM 9, Palu-Central Sulawesi (94119) Indonesia
[2]Agrotechnology Study Program, Faculty of Agriculture and Animal Husbandry, Abdul Azis Lamadjido University, Jln. Dr. Suharso, West Besusu Village, Palu, Indonesia
[3]Student of the Agrotechnology Study Program, Faculty of Agriculture, Tadulako University, Jl. Soekarno-Hatta Km 9, Tondo-Palu 94119, Central Sulawesi. Indonesia.

*E-mail: sakkasamudin@untad.ac.id

ABSTRACT

Fertilization technology is one way to increase the growth and yield of local gogo rice, so the right dose is needed for maximum growth and production and minimal environmental impact. This study aims to get the right dose of NPK and POC fertilizers for the growth and yield of local gogo rice. This research was conducted on the agricultural land of Tamarenja Village (Hamlet III Kalama) with latitude LS 00o26'51.4" BT 119o49'50.5, Sindue District, Donggala Regency, Central Sulawesi Province. The altitude of the place is 230 masl. The study began from November 2020 to March 2021. This study used a factorial pattern Group Randomized Design (RBD). The first factor used four doses of pearl NPK fertilizer: N0= without NPK fertilizer, N1= 100 kg/ha, N2= 200 kg/ha, N3= 300 kg/ha. The second factor consisted of three concentrations: P0= without POC, P1= POC 1%, and P2= POC 2%, which were repeated three times so that there were 36 experimental plots. The results showed that applying NPK 100 kg/ha without liquid fertilizer increased the number of saplings, the number of productive saplings, panicle length, the amount of grain per panicle, and production. Applying NPK fertilizer 200 kg/ha independently increases plant height, number of leaves, and leaf length and accelerates flowering and harvesting. Independently, using 2% liquid organic fertilizer increases the number of leaves, leaf length, and weight of 1000 seeds of local gogo rice cultivars.

Keywords: NPK Fertilizer, Liquid Organic Fertilizer (POC), Local Gogo Rice Cultivar, Growth and Yield

RESPONSE OF CHINESE CABBAGE (*Brassica Pekinensis*) TO THE COMPOSITION OF GROWING MEDIA AND ORGANIC LIQUID FERTILIZER BASED ON MARKET ORGANIC WASTE

Nini Mila Rahni[1]*, Tresjia Corina Rakian[1], Gusti Ayu Kade Sutariati[1], Zulfikar [2], Waode Siti Anima Hisein[3] dan Arsy Aysyah Anas[2]

[1]Department of Agrotechnology, [2]Department of Soil Science and [3]Department of Plant Protection, Faculty of Agriculture Halu Oleo University, HEA. Mikodompit Street, Anduonohu Kendari

*E-mail: nini.mila.rahni_faperta@uho.ac.id

ABSTRACT

Chinese cabbage (*Brassica pekinensis*) is a horticultural plant that has long been known and cultivated, and it has a fairly high economic value. However, the production of cabbage in Indonesia is still low. The low production of cabbage is closely related to the aspects of soil as the growing medium, extreme climatic conditions, and inadequate cultivation techniques. Most cabbage cultivation is done on marginal land with low fertility and dry climatic conditions. From a cultivation technique perspective, this plant is still cultivated using conventional methods that do not consider environmental sustainability aspects. This study aims to determine the response of Chinese cabbage to the composition of growing media and organic liquid fertilizer based on market waste. The research was conducted from April to June 2024 at the Field Laboratory of the Faculty of Agriculture, Halu Oleo University. This study used a randomized block design (RBD) in a factorial pattern. The first factor was the composition of the growing media, consisting of four treatments: control, soil: rice husk charcoal (2:1), soil: chicken manure fertilizer (2:1), and soil: rice husk charcoal: chicken manure fertilizer (1:1:1). The second factor was organic liquid fertilizer made from cabbage waste, consisting of three treatments: control, 30 mL/plant, and 50 mL/plant. Data were analyzed using analysis of variance and followed by the Honestly Significant Difference (HSD) test at 95%. The results showed that the composition of the growing media and organic liquid fertilizer affected all research variables (plant height, number of leaves, leaf area, fresh weight, and dry weight of the plant). Chinese cabbage gave the best response to the growing media composition of soil: rice husk charcoal: chicken manure fertilizer (1:1:1) and 50 mL/plant organic liquid fertilizer.

Keywords: Cabbage, Composition, Media, Fertilizer, Plant

EFFECTIVENESS OF ORGANIC AMELIORANT FOR IMPROVING PHYSICAL, CHEMICAL, AND BIOLOGICAL PROPERTIES OF DROUGHT-STRESS IN SOIL

Ana Amiroh[1*], Ahmad Yunus[2], Edi Purwanto[2], Eddy Tri Haryanto[2] and Mahayu Woro Lestari[3]

[1]Doctor Program Agriculture Faculty, Universitas Sebelas Maret, Jl. Ir. Sutami No.36, Ketingan, Surakarta
[2]Agriculture Faculty, Universitas Sebelas Maret, Jl. Ir. Sutami No.36, Ketingan, Surakarta
[3]Agriculture Faculty, Universitas Islam Malang, Jl. MT, Haryono 193 Malang

*E-mail: anaamiroh2012@gmail.com

ABSTRACT

Soil fertility is dependent on physical, chemical, and biological properties, which are significantly compromised under drought stress. Therefore, this study aimed to determine the effect of organic ameliorants on soil quality, including the physical, chemical, and biological properties under drought stress. The method adopted was Completely Randomized Design with treatment media such as cow manure (M), rice husk biochar (Bi), water hyacinth bokashi (Bo), and their combinations. Furthermore, drought stress levels were set at 100% (F1), 75% (F2), 50% (F3), and 25% (F4) Field Capacity. Analysis was conducted before and after treatment application, covering soil texture, C-organic (organic carbon), N-total (total nitrogen), P-available (available phosphorus), K-exchangeable (exchangeable potassium), cation exchange capacity (CEC), and bacterial population density. The results showed that soil was clayey, with MBiF1, MBiF4, BoMBiF4, BoF4, and BoMF1, possessing the highest C-organic and P-available, N-total, K-exchangeable, CEC in BoF4, as well as bacterial population density, respectively

Keywords: Ameliorant, Biochar, Bokashi, Drought, Organic

RESISTANCE OF JEMBER KASTURI TOBACCO TO MAJOR DISEASES FOR THE RELEASE OF NEW SUPERIOR VARIETIES

C. Suhara[1], Fatkhur Rochman[1], Marjani[1], Supriyono[1], and Dwi Setyorini[1]*

[1]Research Center for Estate Crops, National Research and Innovation Agency, Bogor (16111), Indonesia

*E-mail: rinibptpjatim@gmail.com

ABSTRACT

Jember Regency is the main producer of Kasturi tobacco. Originally, the North Jember area was the main producer of Kasturi tobacco, but due to declining soil fertility and increasing disease intensity, the development of Kasturi tobacco shifted to the South Jember area. The main diseases in musk tobacco are the fungus Phytophthora nicotianae, the bacterium Ralstonia solanacearum, and the Cucumber Mosaic Virus/Tobacco Mosaic Virus. The fungus Phytophthora nicotianae can reduce yields by about 22%. This resilience evaluation consists of 2 activities: 1) Adaptation test of Jember musk tobacco to the main disease in polybags, and 2) Evaluation of the resistance of musk tobacco to the main disease in the field. The materials used were 13 strains of musk tobacco, including P nicotianae and R solanacearum (K-399) and susceptible (HS) resistant controls, while CMV resistant (Coker 176) and susceptible (Coker 319) controls; Chemicals, fertilizers and sources of inoculum Phytopthora nicotianae, Ralstonia solanacearum and Cucumber Mosaic Virus (CMV). Tobacco strains that are highly resistant to Phytophthora nicotianae Dark BK, Dark IK, and IDX 301 S, while those that are very susceptible are Dark FK, Dark GK, and IDX 302 S. Highly resistant tobacco strains of Ralstonia solanacearum are Dark AK, Dark BK, Dark CK, Dark EK, Dark HK, Dark IK, and IDX 301 S while those that are very susceptible except for moderately resistant ones are Dark FK, Dark GK and IDX 302 S. Tobacco strains that are highly resistant to CMV disease other than control plants have not been obtained

Keywords: Phytopthora Nicotianae, Ralstonia Solanacearum And Cucumber Mosaic Virus (CMV). Disease, Resistant

GROWTH OF PROTOCOLS OF LENJONG (Arachnis sp) GARDENS ON MEDIA WITH VARIOUS TYPES OF ORGANIC MATERIALS IN VITRO

Yuyun Fitriani[1]*, I Nyoman Gede Astawa[1], Rindang Dwiyani[1] dan Ida Ayu Putri Darmawati[1]

[1]Faculty of Agriculture, Udayana University. P.B. Sudirman Street Denpasar Bali

*Email: yuyunfitriani@unud.ac.id

ABSTRACT

Orchids, belonging to the Orchidaceae family, are renowned as the largest family among flowering plants and are highly diverse in Bali's forests. Among these, the Lenjong orchid, scientifically known as Arachnis sp., is notable. This research addresses the challenge of slow growth observed in germinated orchid seeds (protocorms) of the local Balinese Lenjong orchid. The study aims to determine the most effective organic materials to stimulate their growth. Conducted under a completely randomized design (CRD), the study included five organic material treatments: MS (Control), MR (bamboo shoots), MP (vegetable spikes), MJ (sweet corn), MT (taoge), and MB (shallots), each replicated six times. Key variables monitored were shoot growth, number of shoots, and number of leaves. Results highlighted significant findings: the MP treatment (vegetable spikes) demonstrated the quickest shoot emergence at 23.00 days, compared to 29.67 days for the control (MS). Although the number of shoots did not vary significantly across treatments, the MP treatment also exhibited the highest number of leaves (2.33), followed closely by MR (bamboo shoots) with 2.00 leaves. In conclusion, the study identifies MP (vegetable spikes) and MR (bamboo shoots) as the most effective organic materials for promoting the growth of Lenjong orchid protocorms. These findings suggest practical applications in orchid cultivation and conservation efforts in Bali, potentially enhancing the propagation success of this locally significant orchid species. By optimizing growth conditions through organic material supplementation, this research contributes valuable insights to orchid conservation practices and ecosystem management strategies in Bali's rich floral landscapes.

Keywords: Arachnis, Organic Materials, Growth, Protocorm

MORPHOLOGICAL COMPARISON AND METABOLITE PROFILING OF WHITE PHENOTYPE RATNA FLOWER PLANTS IN SIBANGGEDE AND PADANGGALAK AREAS

I Made Basma Redana[1], Rindang Dwiyani[1]*, and Ida Ayu Putri Darmawati[1]

[1]Master of agroecotechnology, Faculty of Agriculture, Udayana University
P.B. Sudirman Street, Denpasar, Bali

*E-mail: rindangdwiyani@unud.ac.id

ABSTRACT

Globe amaranth, known in Bali as the ratna flower (Gomphrena globosa), is a versatile plant from the Amaranthaceae family. It has many uses, including as a ceremonial tool, decoration, and for its medicinal properties. When consumed as an herbal tea, it offers various health benefits. This study aimed to compare the morphology and floral metabolite profiles of the white phenotype from the Sibanggede and Padanggalak areas, utilizing Gas Chromatography Mass-Spectrometry for analysis. Observations of the white phenotype in these areas revealed similar morphological diversity, with differences mainly in the upper leaf surface and stem colors. In Sibanggede, the upper leaf surface is Brilliant Yellowish Green, and the stem is Strong Purplish Red. In Padanggalak, the upper leaf surface is Vivid Yellowish Green, and the stem is Brilliant Yellowish Green.Metabolite profiling indicated that both regions' plants contained fatty acid compounds such as n-Hexadecanoic acid (Palmitic Acid), which has antibacterial and antifungal properties. The major compound in Sibanggede was phytol, known for its antioxidant properties. In contrast, the Padanggalak area's dominant compound was thiophene, which has potential pharmaceutical applications. These differences in morphology and metabolite content are significantly influenced by environmental factors, including altitude, temperature, climate, drought stress, and salinity. The study highlights how these environmental variables can affect the plant's characteristics and chemical composition, contributing to its diverse uses and benefits.

Keywords: Gomprhena globosa, Morphology, Metabolite Profiling

COMBINATION OF BACTERIOPHAGE AND SILICATE ON BACTERIAL WILT DISEASE *(Ralstonia solanacearum)* CONTROL

Aima Ayuningtyas[1,2], Nanda Putri Nurdini[2,3]*, Desi Rejeki[2,4] and Hardian Susilo Addy[1,2,*]

[1]Biotechnology Study Program, Graduate Program, University of Jember
[2]Applied Molecular and Microbial Biotechnology (AM2B) Research Group, University of Jember
[3]Plant Protection Study Program, Faculty of Agriculture, University of Jember
[4]Sekolah Tinggi Ilmu Pertanian (STIPER), Jember

*E-mail: hsaddy.faperta@unej.ac.id

ABSTRACT

Bacterial wilt is an important disease affecting tomato plants, caused by the bacterium *Ralstonia solanacearum.* The disease can infect plants from the vegetative to generative phases, drastically reducing tomato production ranging from 20% to 100%. Quorum Quenching (QQ) agents present an alternative approach to control bacterial wilt disease such as Potassium Silicate (K_2SiO_3). In addition, bacteriophages have potential as biological agents due to their ability to lyse host bacteria. Currently, there is limited research that explicitly explores the potential of synergistic effects of K_2SiO_3 and bacteriophages in controlling bacterial wilt disease. This study investigated the impact of K_2SiO_3 on bacterial growth in media containing 0.01% 2,3,5-Triphenyl tetrazolium chloride and evaluated the combined effect of bacteriophages and K_2SiO_3 in suppressing bacterial wilt disease in tomato plants. K_2SiO_3 showed Quorum Quenching ability by affecting the production of extrapolysaccharides (EPS) in the first 12 hours of observation, but also had an impact on bacterial growth. The combined application of bacteriophages and K_2SiO_3 significantly reduced the incidence and severity of wilt disease, reaching a control effectiveness level of 69%. These results implicates the potential of the combination of K_2SiO_3 and bacteriophages to control bacterial wilt disease in tomato plants.

Keywords: ***Ralstonia solanacearum*, Tomato, Quorum Quenching, K_2SiO_3, Bacteriophage**

THE DIVERSITY OF VANDA ORCHIDS IN INDONESIA

Rindang Dwiyani[1]*, Ida Ayu Putri Darmawati, I Putu Sudiarta, Gusti Alit Susanta Wirya, Dewa Gede Wiryangga Selangga, Putu Benny Santika

[1]Agroecotechnology Study Program, Faculty of Agriculture, Udayana University
P.B. Sudirman Street, Denpasar, Bali

*E-mail: rindangdwiyani@unud.ac.id

ABSTRACT

Vanda orchids are a genus of epiphytic orchids found mostly in Southeast Asia and have been known since 1795. Vanda have been part of Indonesian culture for centuries, used as ornamental plants and traditional medicinal ingredients. Vanda have distinctive features such as ribbon-shaped leaves, cluster-shaped inflorescences, and flowers of various colours and scents. These morphological characters are important for species and variety identification. This study aims to determine the morphological characteristics of Vanda in Indonesia, the research was conducted by purposive sampling with sampling done using simple random sampling technique. The results showed that the natural habitat of Vanda grows in various natural habitats in Indonesia, from lowlands to mountains with an altitude of 0-1700 masl. These conditions favour optimal growth and flowering of Vanda. Vanda species found in Indonesia are Vanda tricolor found in Bali and West Java, which has flowers with white petals with purple spots and a fragrant aroma. Vanda helvola grows in Sumatra, Java, Kalimantan and Sulawesi, with white or pale yellow flowers. Vanda limbate has dark red and pink flowers and grows at an altitude of 200-800m above sea level. Vanda foetida: Endemic to South Sumatra, white flowers with a pink tinge and a specific sulphurous aroma. Vanda tenebrosa dark brown to almost black flowers, grows in Sumatra. Vanda jennae creamy white flowers with pink blotches, grows at 800-1500m above sea level. Vanda arcuate brownish flowers with a yellow border, native to the mountainous regions of Sumatra.

Keywortehds: Vanda Orchid, Diversity, Indonesia

THE EFFECT OF CHEMICAL MUTAGENS EMS (Ethyl Methane Sulfonate) AND ORYZALIN ON GERMINATION OF RATNA FLOWERS (*Gomphrena globosa* L.)

Ni Luh Asri Pradnyani[1]*, Rindang Dwiyani[1], dan Ida Ayu Putri Darmawati[1]

[1]Master of Agroecotechnology, Faculty of Agriculture, Udayana University
P.B. Sudirman Street, Denpasar, Bali

*E-mail: rindangdwiyani@unud.ac.id

ABSTRACT

Ethyl Methane Sulfonate (EMS) and Oryzalin are chemical mutagens that are widely used in biotechnology and plant breeding. Both of these agents contribute to increased genetic variation and plant adaptation. Plants that are induced by this chemical mutagen are usually ornamental plants. In this research, Ratna flowers are used from Sibanggede and it's commonly used for ceremonies and decorations. This research aims to evaluate the effect of chemical mutagens on the germination process of Ratna flowers (*Gomphrena globosa* L). This study used a three-factor completely randomized design without dose comparison. The first factor is EMS, the second factor is Oryzalin and the third factor is the difference in genotype, namely purple and pink Ratna flowers. The results showed that EMS and Oryzalin treatment had a significant effect on all observed parameters. The use of EMS and Oryzalin tended to reduce plumule length, radicle length, and discoloration of the sprouts. Apart from that, the germination capacity and percentage of normal sprouts also showed a significant decrease after treatment with the chemical mutagen. Based on a comparison of the two genotypes, it can be seen that purple Ratna flowers show better results than pink Ratna flowers. These findings indicate that EMS and Oryzalin can influence the germination process of Ratna flowers.

Keywords: EMS, Oryzalin, Germination, *Gomphrena globosa* L.

GROWTH AND YIELD RESPONSE OF PAGODA MUSTARD PLANTS (*Brassica Narinosa*) TO APPLICATION OF LIQUID ORGANIC FERTILIZER (POC) FROM FRUIT WASTE AND COCONUT WATER

Sri Hartatik[1]*, Slameto[1], Ahmad Ilham Tanzil[2] and Hindrya Kusuma Ning Tyas[2]

[1]Departemen of Agronomy, Faculty of Agricultural, University of Jember, Jl. Kalimantan 37 Jember, 68121 - Indonesia
[2]Departemen of Agrotechnology, Faculty of Agricultural, University of Jember, Jl. Kalimantan 37 Jember, 68121 - Indonesia

*Email: hindryatyas01@gmail.com.

ABSTRACT

Pagoda mustard greens (Brassica norinosa L) is a type of mustard greens that has high economic value. Production of mustard greens in Indonesia in 2022 will experience fluctuations caused by inappropriate cultivation techniques. One step to overcome the challenges in cultivating Pagoda Mustard Greens is to increase soil fertility by using fruit waste as Liquid Organic Fertilizer (POC). Pagoda mustard greens also require growth regulators (ZPT) to increase Pagoda mustard production, one of which is coconut water. This research was conducted at the Agrotechnopark, University of Jember and the Soil Department, Faculty of Agriculture, University of Jember. This research used a factorial completely randomized design (CRD). Factors for providing POC for fruit waste consisting of 4 treatment levels. Coconut Water concentration factor with 4 levels carried out. POC concentration of fruit waste P0 Without POC (Control), P1(30 ml), P2(60 ml), P3(90 ml). Coconut Water Concentrate, K0 Without Coconut Water (Control), K1 (25 ml), K2(50ml), K3(75 ml). The interaction treatment of Liquid Organic Fertilizer (POC) fruit waste and mature coconut water had a significant influence on the variables of plant dry weight and leaf chlorophyll content. 50 ml POC concentrate and 75 ml coconut water (P2K3) gave average dry weight results of 6.00 g and 55.00 g. The effect of Liquid Organic Fertilizer (POC) treatment on fruit waste had a significant effect on all variables except canopy area and chlorophyll content. The effect of coconut air treatment had a significant influence on the variables of canopy area and plant dry weight.

Keywords: Mustard Pagoda, Liquid Organic Fertilizer, Old Coconut Water, Fruit Waste.

SYMBIOSIS RESPONSE OF RHIZOBIUM JAPONICUM KIRCHNER WITH SOYBEAN {Glycine Max (L.) Merril} ROOTS TO THE APPLICATION OF GLIOCLADIUM VIRENS MILLER

Yenny Muliani[1]*, Anton Yustiano[2], Risma Yulianti Pratiwi[1], T. Turmuktini[3]
[1]Agroteknologi, Fakultas Pertanian, Uninus Bandung
[2]Balai Besar Peramalan Organisme Pengganggu Tumbuhan
[3]Universitas Winaya Mukti

*Email: yennymuliani62@gmail.com

ABSTRACT

Soybean plants are able to fix nitrogen (N) from the atmosphere through a mutualistic symbiosis between the Rhizobium japonicum Kirchner bacteria and the roots, by infecting the roots and forming root nodules and fixing N in the air. Research to determine the reaction after application of Gliocladium virens Miller on the development of root nodules on soybean plants. The research used a Randomized Block Design (RAK) consisting of 6 treatments and 4 replications, consisting of Control (without treatment), Gliocladium virens Miller 5 g, 10 g, 15 g, 20 g, 25 g/plant. The research results showed that the application of G. virens at a dose of 25 g/plant was the best dose in helping the development of root nodules on soybean plants.

Keywords: Rhizobium Japonicum Kirchner, Gliocladium Virens Miller, Symbiosis

ANATOMICAL VARIABILITY OF LEAVES, STEM AND ROOT AMONG TARO (Colocasia esculenta var esculenta)

Lutfy Ditya Cahyanti[1]*, Mahmudah Hamawi[1], and Use Etica[1]

[1]Study Program of Agrotechnology, Faculty of Science and Technology, University of Darussalam Gontor (UNIDA Gontor), Ponorogo 63471, Indonesia

*E-mail: lutfyditya@unida.gontor.ac.id

ABSTRACT

Colocasia esculenta is important staple food, grown primarily for its edible corms, root and vegetables. In order to assess genetic variability of plants, a variety of morphological, anatomical, biochemical and molecular markers are used Few reports are available about structure of taro leaves, stem and root antomy. This study explains about leaf, stem, and root anatomy of taro. This research observed six genotypes of Colacasia esculenta var esculenta from Sukabumi (West Java) i.e: (jepang putih, jepang merah, gambir, semir, ketan and sutra). In three blocks of replications, taro were cultivated using sucker. Plant anatomy (leaf, stem, and root) were analyzed after harvest time at Central Laboratory Science and Technology, Darussalam Gontor University. From this research, explained that 5 genotypes of taro has significant different of leaf, stem and root anatomy of taro. Chlorophyll content, number and length of stomata and epidermis, length of leaf and stem epidermis, also length of root epidermis, endodermis, cortex, and stele among genotypes of taro were statistically different. Gambir genotype has the highest chlorophyll a, chlorophyll b and total chlorophyll content. Jepang merah has the thickest root epidermis and korteks, gambir genotype has the thickest root endodermis, while semir has the thickest root stele. Ketan genotype has the highest number of stomata and epidermis.

Keywords: Taro, Leaf, Stem, Root

EXPLORATION OF SOIL FUNGI IN THE TOMATO RHIZOSPHERE

Ahmad Ilham Tanzil[1,4]*, Hari Purnomo[1,2], Wahyu Indra Duwi Fanata[1,3,4], Ummi Sholikhah[1], Nanang Tri Haryadi[1], Mohammad Ubaidillah[1], Agung Sih Kurnianto[1], Irwanto Sucipto[1], Wildan Muhlison[1], Tri Ratnasari[1], Nilasari Dewi[1], Ida Wenefrida[5] and Herry Utomo[5]

[1]Agrotechnology, Agriculture Faculty, University of Jember, Jl. Kalimantan No. 37, Kampus Tegalboto, Jember 68121, Indonesia
[2]Plant Protection, Agriculture Faculty, University of Jember, Jl. Kalimantan No. 37, Kampus Tegalboto, Jember 68121, Indonesia
[3]Postgraduate Program in Biotechnology, University of Jember, Jl. Kalimantan No. 37, Kampus Tegalboto, Jember 68121, Indonesia
[4]Laboratory of Molecular Biology and Biotechnology, Center for Development of Advanced Science and Technology (CDAST), University of Jember, Jl. Kalimantan No. 37, Kampus Tegalboto, Jember 68121, Indonesia
[5]LSU AgCenter, Louisiana State University, Rayne, LA, United States. 1373 Caffey Road Rayne, LA 70578.

*E-mail: aitanzil@unej.ac.id

ABSTRACT

Soil fungi is an indicator of biological components of the soil fertility. Furthermore, the biological components of soil are also influenced by microorganisms. Currently, soil fertility on agricultural land is decreasing. This study focuses on the exploration of soil fungi inhabiting the rhizosphere of tomato plants. The rhizosphere, being the narrow region of soil influenced by root exudates, harbors a diverse community of microorganisms crucial for plant health and productivity. Fungi, particularly, play significant roles in nutrient cycling, disease suppression, and overall soil ecosystem dynamics. Therefore, it is necessary to carry out research regarding the exploration in soil fungi, especially in the tomato rhizosphere. In this research, soil samples were collected from tomato fields. The methods used are soil fungus isolation, purification, macroscopic and microscopic identification. The objectives were to characterize the diversity and composition of fungal species associated with tomato roots and to identify potential beneficial or pathogenic taxa. The results of the research found 11 isolates with 7 genera consist of Acremonium sp., Aureobasidium sp., Cephalosporium sp., Chrysosporium sp., Mucor sp., Penicillium sp., Rhizopus sp. The diversity of soil fungi in tomato rhizosphere is medium diversity, moderate distribution of the number of individuals of each type, no one domination, high uniformity. This study contributes to understanding the complex interactions within the tomato rhizosphere, emphasizing the ecological importance of soil fungi in agricultural systems. Future research directions include exploring the functional roles of specific fungal taxa and their potential applications in sustainable crop management practices.

Keywords: Soil Fungi, Diversity, Biotic, Rhizosphere, Soil Fertility

CHROMOSOME AND KARYOTYPE ON HYBRID Dendrobium Bigibbum AND D. Lineale

Sri Hartati[1,2]*, Teguh Prastya[2], and Kholid Rifai[2]

[1]Center for Research and Development of Biotechnology and Biodiversity, Universitas Sebelas Maret,
[2]Department of Agrotechnology, Faculty of Agriculture, Universitas Sebelas Maret

*E-mail: tatik_oc@yahoo.com

ABSTRACT

Dendrobium is the genus with the highest species diversity in Indonesia. The aesthetic value and unique structure of flower shape and color make the demand for this genus the highest compared to other genus in the Orchidaceae family. Cytological information plays an important role in the success of plant breeding programs. This research aims to study the cytology of chromosomes and karyotype in D. bigibbum and D. lineale, as well as the hybrid. Cytological observations were observed through chromosome preparations made using the squashing method. The karyotype of the hybrid chromosomes of D. bigibbum as parent male x D. lineale as parent female and D. bigibbum as parent female x D. lineale as parent male is 2n = 2x = 38 = 19m. The chromosome size of D. bigibbum was 1.84 ± 0.30 µm, and D. lineale was 1.77 ± 0.31 µm, while the hybrid of D. bigibbum x D. lineale had a shorter size (1.18 ± 0.21 µm) than the hybrid of D. lineale x D. bigibbum (1.37 ± 0.21 µm). Analysis of the A1 (≤ 0.15) and A2 (≤ 0.18) asymmetry index of these Dendrobium had small or near zero values, so heard had symmetrical karyotype pattern in the form of metacentric and low size dispersion.

Keywords: Asymmetry, Cytology, Hybrid, Simmetry, Squash

Biotechnology and Biomolecule

ISOLATION AND TESTING OF THE ABILITY OF PHOSPHATE AND POTASSIUM SOLUBILIZING BACTERIA FROM SEVERAL VEGETATIONS ON THE SLOPES OF MOUNT SEMERU POST-ERUPTION

Tri Candra Setiawati[1]*, Romy Manulang[1] dan Aldira Rahmania[1]

[1]Soil Science Study Program, University of Jember, Jember, Indonesia

*E-Mail: candra.setiawati.faperta@unej.ac.id

ABSTRACT

The eruption of Mount Semeru, which occurred from December 2021 to early 2022, had an impact on covering agricultural land with volcanic material, including volcanic ash, which can change the elemental composition, physical and chemical characteristics, and activity of soil microorganisms. This research aims to (1) isolate potassium solubilizing bacteria and phosphate solubilizing bacteria in soil samples originating from the rhizosphere of rice, corn, sugar cane, and pine vegetation affected by volcanic ash cover with varying thickness of cover; (2) test the ability of potassium solubilizing bacteria and phosphate solubilizing bacteria quantitatively in vitro. Field research was carried out on the slopes of Mount Semeru 500-800 meters above sea level in 4 plant rhizospheres, namely sugar cane and pine vegetation, to isolate potassium solubilizing bacteria (BPK). while, rice and corn vegetation rhizosphere was used to isolate phosphate-solubilizing bacteria (BPF). Testing of the solubilization capability of isolates was carried out on Pikovakaya solid and liquid selective media with P source Ca3(PO4)2 and Phosphate Rock for BPF, as well as Alexandrovs media with KH2PO4 sources and volcanic ash for BPK. The results of the isolation of phosphate solubilizing bacteria after qualitative tests obtained four isolates with the largest population of 18.1 x 105 Cfu/gr from the rice rhizosphere and nine isolates from the corn rhizosphere with the largest population of 1.42 x 105 Cfu/gr. Quantitative dissolution test on liquid Pikovskaya media, BPF strain 14EP was effective in dissolving phosphate in the Phosphate Rock source by 2.39 ppm in the fifth week and 153% greater than without isolate, while strain 22AJ dissolved phosphate in the Ca3(PO4)2 source by 1.52 ppm at week 5 and 26% greater than controls. The quantitative potassium dissolution test in liquid media was used by two isolates from the sugar cane rhizosphere (strain TB2 and TE3) and two isolates from the pine rhizosphere (strain PA3 and PB2) with volcanic ash as a potassium source. It was found that all isolates had the ability to dissolve K up to the 3rd week with the dissolution concentration was 26.00 ppm in the 2nd week and 27.27 ppm in the 3rd week.

Keyword: Volcanic Ash, Phosphate Rock, Solubility Index

ISOLATION, SEQUENCING, AND CLONING OF THE PCBC GENE ENCODING ISOPENICILLIN N SYNTHASE FAMILY OXYGENASE FROM *SERRATIA PLYMUTHICA* UBCF_13 IN *ESCHERICHIA COLI*

F Nursyafi[1], J Jamsari[2]*, N Hilbertina[3], D Pertiwi[4], H Hasmiwati[5], J Nazar[6], I Hasibuan[1], L Aliya[1], A Ananda[1]

[1]Department of Biomedical Science, Faculty of Medicine, University of Andalas, Padang, Indonesia
[2]Department of Genomic and Molecular Breeding, Faculty of Agriculture, Andalas University, Padang, Indonesia
[3]Department of Anatomical Pathology, Faculty of Medicine, Andalas University, Padang, Indonesia
[4]Department of Clinical Pathology, Faculty of Medicine, Andalas University, Padang, Indonesia
[5]Department of Parasitology, Faculty of Medicine, Andalas University, Padang, Indonesia
[6]Department of Pharmacology, Faculty of Medicine, Andalas University, Padang, Indonesia

*E-mail: jamsari@agr.unand.ac.id

ABSTRACT

Bacterial infections are a leading cause of global mortality and a priority health issue identified by WHO. Antibiotics are commonly used to treat these infections, but excessive use has led to resistance in many organisms. Developing semisynthetic penicillin is one approach to overcoming resistance due to its better antimicrobial activity. Isopenicillin N synthase (IPNS) is crucial for the biosynthesis of semi-synthetic penicillin, as it catalyzes the oxidative condensation of delta-(L-alpha-aminoadipyl)-L-cysteinyl-D-valine (LLD-ACV) to isopenicillin N. Through genome mining studies of *Serratia plymuthica* (*S. plymuthica*) UBCF_13, the presence of the pcbC gene encoding isopenicillin N synthase family oxygenase (IPNSfo) was revealed. Therefore, in order to provide a low-cost and high-performance IPNS enzyme, this study aims to isolate, sequence, and clone the pcbC gene from *S. plymuthica* UBCF_13 in *Escherichia coli* (*E. coli*). To achieve this objective, the following tasks were carried out: Isolation of the pcbC gene using PCR with specific primers, sequencing, bioinformatics analysis for further enzyme characterization, and cloning the *pGEM_pcbC* vector into *E. coli*. Electrophoresis confirmed successful gene isolation, with the optimal annealing temperature for the pcbC gene-specific primer at 64.4°C. Colony PCR verified the presence of *pGEM_pcbC* in transformant bacteria. Sequencing analysis showed that the consensus sequence has perfect similarity and 0% phylogenetic distance to *S. plymuthica* UBCF_13 genome. Bioinformatics analysis showed successful enzyme structure modeling with I-TASSER. Additionally, domain analysis identified three main domains in the IPNS enzyme: DIOX_N, IPNS-like_FE2OG_OXY, and Oxoglu/Fe_dep_dioxygenase. These findings demonstrate the successful isolation, sequencing, and cloning of the pcbC gene from *S. plymuthica* UBCF_13 in *E. coli*.

Keywords: Isopenicillin N Synthase, Semisynthetic Penicillin, Cloning, Sequencing, E. coli DH5α.

GIVING OF CELLULOTYTIC BACTERIA CONSORTIUM TO PRODUCE QUALITY BANANA PEEL COMPOST

Gusmawartati[1]*, Yosa Erlinda[1] and Fifi Puspita[1]

[1]Department of Agrotechnology, Faculty of Agriculture, Riau University, Pekanbaru, Indonesia

*E-mail: gusmawartati@lecturer.unri.ac.id

ABSTRACT

Compost as a soil improver is able to increase fertility and crop production. Banana peel can be used as compost because it contains nutrients. One way to speed up the composting of banana peels is by giving cellulolytic bacterial decomposers. The purpose of the study was to obtain cellulolytic bacterial cancorsium in accelerating composting and producing quality compost Indonesian national standard (SNI). The study used a complete randomized design. The treatment was the giving of several consortia of cellulolytic bacteria, consisting of five levels repeated three times. Observational Data are presented in qualitative and quantitative form. Qualitative data were analyzed descriptively while quantitative data were analyzed using a variety of fingerprint analysis, when there is a real impact, continued further testing with the Honestly Significant Difference test (HSD) at the level of 5%. The results showed that the giving of cellulolytic bacteria consortium did not significantly affect the shrinkage volume, C-organic, C/N ratio, P-total, K-total, PH compost but significantly affect the N-total. Consortium V was the best treatment with volume shrinkage of ±64%, C-organic ±48%, N-total ±1.9%, C/N ratio of ±25, P-total ±0.4%, K-total ±8.5% and ±7 pH.

Keywords: Banana Peel, Cellulolytic Bacteria, Decomposition, Compost, Consortium

THE EFFECT OF DIFFERENT MEDIA AND BAP ON PLANLET GROWTH OF PHALAENOPSIS OX RED LION 'THE CONQUEROR'

Sri Hartati[1,2]* and Rafidah Agnesa Candra Kirana[2]

[1]Center for Research and Development of Biotechnology and Biodiversity, Universitas Sebelas Maret, Surakarta, Central Java, Indonesia
[2]Department of Agrotechnology, Faculty of Agriculture, Universitas Sebelas Maret, Surakarta, Central Java, Indonesia

*E-mail: tatik_oc@yahoo.com

ABSTRACT

Orchid is an ornamental plant that people love because it has flowers with beautiful shapes, colors, and patterns, and has high economic value. Orchids have very small seeds that are difficult to grow in natural conditions. One way to grow orchid seeds is by using tissue culture technique. Seeds of the hybrid orchid Phalaenopsis OX Red Lion 'The Conqueror' were cultured in an artificial medium and each medium has a different composition. Culture media can be added with growth regulators from cytokinins namely BAP that affect plant growth. The purpose of this study was to determine the effect of various media (MS, VW, Growmore) and BAP concentration (without BAP application, 0,5 ppm, 1 ppm, 1,5 ppm) for the growth of hybrid orchid and the interaction between the two. Research data were analyzed by analysis of variance, if significantly different followed by Duncan's Multiple Range Test (DMRT) at the 5% level. The results showed the combination of MS media and BAP 0,5 ppm had the highest number of roots, while the BAP 0,5 ppm produced the highest plantlet height and leaves length. Different media had an effect to planlet growth, MS media had the highest number of leaves, VW media had the highets number of shoots and root length, and Growmore media had the fastest root emergence time.

Keywords: Cytokinins, Growmore, MS, Plant Growth Regulator, VW

Agricultural Engineering and Technology

ENHANCING HORTICULTURAL EFFICIENCY USING PHOTOVOLTAIC-POWERED DRIP FERTIGATION AND IoT

Cahyoadi Bowo[1]*, Emil Reginald Bowo[2], Muhammad Hafizh[1] and Victor B. Asio[3]

[1]Department of Soil Science, Faculty of Agriculture, University of Jember, Indonesia
[2]Department of Electrical Engineering, Faculty of Intelligent Electrical and Informatics Technology, Institut Technology of Sepuluh Nopember, Surabaya, Indonesia
[3]Department of Soil Science, College of Agriculture, Visayas State University, Baybay City, Philippines

*E-mail: cahyoadi.bowo.faperta@unej.ac.id

ABSTRACT

Increased farming efficiency requires automation in agricultural activities. This research explores the application of automatic drip fertigation combined with the Internet of Things (IoT) in melon cultivation within a net house. Photovoltaic (PV) technology was employed to enhance resource efficiency. Four capacitive soil moisture DHT-21 sensors were installed at 10 cm depths in 10 soil lysimeters. We applied a TDS meter to measure total dissolved solids, including fertilizer content. Data from the sensors were collected via an Arduino Nano board and transmitted to the ThingSpeak™ platform using ESP-01 and a GSM modem. Soil moisture and environmental conditions were monitored to activate a submerged water pump between soil water suctions of around 3000 and 300 hPa. NPK 16-16-16 fertilizer was diluted in a 300-liter tank to a concentration of 1300 ppm and automatically fertigated through a venturi system. One melon plant was transplanted per lysimeter, with plant growth, irrigation uniformity, fertilizer concentration, and water usage measurements. The results demonstrate that the IoT-based drip irrigation system powered by solar energy enhances water, fertilizer, and labor efficiency while providing improved control over soil and plant conditions. The system's efficiency and remote monitoring capabilities underscore its suitability for eco-friendly and sustainable agriculture. In conclusion, the IoT system for drip irrigation with Photovoltaic improved water, fertilizer, and labor efficiency. It facilitated better soil and plant control, supporting food availability on limited land in sustainable agriculture.

Keywords: Automatic drip irrigation, Fertigation, Internet of Things, Photovoltaic

EFFECT OF WATER CONTENT AND NPK ENRICHMENT ON PROPERTY OF A PELLETIZED COMPOST

Sugeng Triyono[1]*, Agus Haryanto[1], Elhamida Rezkia[1], Diannisa Widdi Eka Ningrum[1], Dermiyati[2]

University of Lampung, College of Agriculture, Department of Agricultural Engineering, Sumantri Brojonegoro St # 1, Bandar Lampung City, Lampung Province, Indonesia, 35145.
University of Lampung, College of Agriculture, Department of Soil Sciences, Sumantri Brojonegoro St # 1, Bandar Lampung City, Lampung Province, Indonesia, 35145.

*E-mail: striyono2001@yahoo.com

ABSTRACT

Problem of compost is due to the bulky volume, hindering in handling, packaging, storing, transportation, and application. This research study aimed to evaluate the effect of water addition and NPK enrichment to powder compost on some properties of pelletized compost fertilizer produced. Completely randomized design with factorial arrangement and two factors is implemented. The first factor is NPK addition to the powder compost, consisting of three levels: 0%, 3%, and 6% on the basis of compost dry weight. The second factor is water content of the powder compost, consisting of three levels: 10-15%, 20-25%, and 30-35%. Each treatment combinations are pelletized using an auger-type machine and dried under the sun. After the sun drying, heap of pellets is sampled with three replicates randomly and tested for physical and chemical properties. The data sets are analyzed by using analysis of variance and followed by LSD multiple comparation. The results showed that water content and NPK enrichment significantly affected some physical properties of compost pellets, namely: the bulk density (517.65 to 587.60 $kg.m^{-3}$), particle density (1059.55 to 1329.91 $kg.m^{-3}$), compressive strength (2.08 to 7.78 $MN.m^{-2}$), solidity (42.66 to 91.91%), PDI (62.11 to 97.68 %), and disintegration time (74.44 to 147.56 hours), acidity (6.29-6.96). The results also showed that all treated pellets were hygroscopic. Pellets durability was known as much affected by water content levels whilst pH was affected by NPK enrichment levels. Phosphorus and potassium contents of the pellet could be considerably maintained, whilst nitrogen loss from the pelletizing process was noticeable. At last, the experiment revealed that the treatment combination of 10-15% water content and 3% NPK resulted in the lowest dissoluble pellet, while 20-25% water content and 0% NPK, and the 30-35% water content and 0% NPK produced the highest dissoluble compost pellets.

Keywords: Compost, Enrichment, Fortification, Pellet, Slow Release

INCREASING BIOGAS PRODUCTION THROUGH SOAKING EMPTY PALM OIL BUNCHES (EFB) IN POME (PALM OIL MILL EFFLUENT)

Agus Haryanto[1]*, Sugeng Triyono[1], Udin Hasanudin[2], Afid Fitro Setiawan[2], and Dewi Agustina Iryani[3]

[1]Department of Agricultural Engineering, University of Lampung
[2]Department of Agro-Industrial Technology, University of Lampung
[3] Department of Chemical Engineering, University of Lampung

*E-mail: agus.haryanto@fp.unila.ac.id

ABSTRACT

The process of extracting crude palm oil or CPO produces liquid waste called POME (Palm Oil Mill Effluent) and a lot of solid waste from empty palm fruit bunches (RFB). POME wastewater contains high levels of organic matter so it can be used as a substrate for biogas production. Apart from being able to reduce greenhouse gas (GHG) emissions through methane capture, converting waste water into biogas can also improve the circular economy through saving fossil fuels and using biogas as generator fuel to generate electricity. Biogas production is highly dependent on the organic material content in POME wastewater. The fluctuating daily production capacity of palm oil mills due to depending on the availability of palm fruit will cause fluctuations in waste water production and fluctuations in biogas production. It is hoped that immersing EFB in POME wastewater will increase the organic material content in POME which in turn will increase biogas production and its stability. Therefore, it is necessary to study the optimal method for soaking EFB because EFB is a material that is difficult to decompose. The long-term goal of this research is to obtain biogas production technology through EFB immersion so as to produce stable biogas. Meanwhile, the specific target to be achieved in this research is to determine the best method of immersing EFB in POME wastewater for biogas production.

Keywords: Biogas, Empty Fruit Bunch, Oil Palm, Sustainability, Wastewater

ANALYZING PINEAPPLE (*Ananas Comosus* L.) MD2 TRANSLUCENCY WITH VISIBLE AND INFRARED THERMOGRAPHY

Sri Waluyo[1]*, Siti Suharyatun[1], Febryan Kusuma Wisnu[1], Anggie Nafyta Lestari[1], Istiqomah[1]

[1]Department of Agricultural Engineering, University of Lampung.
Jl. Soemantri Brojonegoro, No. 1, Bandar Lampung, Indonesia, 35145

*E-mail: sri.waluyo@fp.unila.ac.id

ABSTRACT

Translucent pineapples have a physiological abnormality where the fruit's flesh turns clear and their water content tends to be higher than usual. The pineapple must be cut so that the examination is destructive in order to discover translucency. The suggestion is to develop an artificial neural network (ANN) backpropagation model to estimate translucent MD2 pineapple fruit non-destructively using visible and infrared thermography as an input variable. The MD2 pineapple utilized in this investigation was acquired from PT Great Giant Pineapple PG 4 Lampung Timur. Two types of pineapples were selected from the sample of eighty: a translucent pineapple with four distinct levels of ripeness and a regular pineapple. According to the study's findings, there is a statistically significant difference in the fruit quality metrics between translucent and regular fruits. The creation of artificial neural networks featuring a tansig-tansig-tansig activation function, four input nodes, ten hidden layer-1 nodes, ten hidden layer-2 nodes, and two outputs, along with a network architecture, demonstrated a respectable level of performance, as demonstrated by $R^2 = 1$ and RMSE = 0.003 for training and $R^2 = 0.60$ and RMSE = 0.353 for testing. With an accuracy of 87.5%, the generated model could forecast the translucency rate. Thus, non-destructive methods such as visible imaging and near-infrared thermography may be utilized to forecast the translucency of MD2 pineapples.

Keywords: Artificial Neural Network, Pineapple, Translucency, Thermal Image, Visible Image

DETERMINATION OF SAMPLE POINTS BASED ON CHARACTERISTICS OF LAND RESOURCES USING GIS AND AGLOMERATIVE HIERARCHICAL CLUSTERING

Subhan Arif Budiman[1]*, Amadea Candra[2] Bambang Hermiyanto[1], Basuki[1]

[1]Soil Science Program, Faculty of Agriculture, Jember University
[2]Student of Soil Science Program, Faculty of Agriculture, Jember University

*E-mail : sabudiman@unej.ac.id

ABSTRACT

Soil sample points are usually determined based on the variability of land resources manually, where the process is very dependent on the map scale that used and interpretation capabilities of the personal. So that the result could be different and not stable. This research used a combination of Geographycal Information System (GIS) and Aglomerative Hierarchical Clustering (AHC) clustering methods on land resources data such as soil type (Andic Dystrudepts, Typic Dystrudepts, Typic Epiaquepats, Typic Eutrudepts), slope (0-3%, 3-8%, 8-15%, 15 -25%, 25-40%), altitude (0-100, 100-200, 200-300, 300-400, 400-500, 900-1000 m above sea level) and land use (forest, plantations, moors, rice fields, paddy fields rainfed). The main advantage of this method was that it could identify Land Map Units (LMU) on a much more detailed scale compared to the manual system and stable result because of using software. The research was conducted in the Klatakan Sub-watershed, which is part of the Bedadung Watershed, Jember Regency, Indonesia with an area of 9,507.01 ha. The overlay process was carried out in the Pedoclimate and land resources Laboratory of the Faculty of Agriculture, Jember University in August sd. Nopember 2023. The overlay processed of landresources data using ArcGIS 10.8 were produced 45 LMU. Then the overlay results were made into clusters using the AHC method with XLSTAT software and gave the best results in 15 clusters with a variance decomposition of 82.64%. In other words, by using 15 sample points, the model can explain 82.64% of the data population.

Keywords: Land Map Units, GIS, AHC, Soil Samples, And Ward Methods

SOIL EROSION HAZARD ON ROBUSTA COFFEE LAND PLANTATION IN JEMBER REGENCY AT SLIGHTLY WET CLIMATE

Ika Purnamasari[1]*, Muhammad Noer Kholis[1], Yagus Wijayanto[1], Subhan Arif Budiman[2], Tri Wahyu Saputra[1], Suci Ristiyana[1]

[1]Agrotechnology Study Program, Faculty of Agriculture, University od Jember
[2]Soil Science Study Program, Faculty of Agriculture, University od Jember

*E-mail: ikapurnamasari@unej.ac.id

ABSTRACT

One of the Robusta Coffee fields in Jember Regency is at PTPN I Regional V Kebun Renteng Banjarsari Afdeling Rayap. This 357-hectare coffee field has the potential for quite high erosion. This is because the Plantation has quite high rainfall and has a Slightly Wet Climate type according to the Schmid Ferguson climate classification. Apart from that, the plantation is 300 – 1,000 meters above sea level with a land slope of 0-45o. An erosion study needs to be carried out to calculate the erosion hazard level on Robusta coffee plantations. Prediction of erosion hazard level can be calculated using the Universal Soil Loss Equation (USLE) method with Geographic Information System (GIS). This research aims to analyze the level of erosion hazard on Robusta coffee fields at PTPN 1 Afdeling Rayap. The research results showed that 58% of the land was in the moderate erosion hazard category, 18% had very light to light erosion and 24% of the land was in the heavy to very heavy erosion hazard category.

Keywords: Erosion Hazard Level, GIS, Robusta Coffee, USLE, Slightly Wet Climate

ASSESSING SOIL EROSION AND ITS IMPACT ON FLASH FLOOD EVENTS IN THE BILUK POH WATERSHED, BALI, INDONESIA

Ni Made Trigunasih[1]*, Moh Saiffulloh[2], I Nyoman Sunarta[3] and Ida Bagus Putu Bhayunagiri[1]

[1]Soil sciences and environment, Faculty of agriculture, Udayana University - Indonesia
[2]Faculty of Marine Scinces and Fisheries, Udayana University- Indonesia
[3]Faculty of Tourism, Udayana University-Indonesia

*E-mail: trigunasih@unud.ac.id

ABSTRACT

Soil erosion is a critical issue due to its significant impact on land degradation, soil quality, fertility, and national food security. Typically, soil erosion is examined within the context of watershed hydrology, which is dynamic due to land use changes, climate variability, and topographical differences between upstream and downstream areas. This study focuses on the Biluk Poh Watershed in Bali Province, Indonesia, which experienced a devastating flash flood in October 2022, causing severe economic, infrastructural, and agricultural damage. The primary cause of the flood is believed to be the blockage and sedimentation of river networks due to soil erosion in the upstream area. This research aims to assess the level of soil erosion by integrating remote sensing data and field observations, utilizing the Universal Soil Loss Equation (USLE) method, which includes five factors: R, K, LS, C, and P. The results indicate that the upstream area is predominantly affected by severe to very severe erosion (>480 t/ha/year), with spatial patterns following the steep topography around the river networks. Our findings highlight a strong correlation between upstream erosion potential and the occurrence of flash floods. Therefore, mitigation efforts such as soil conservation on agricultural lands and reforestation of deforested areas are necessary.

Keywords: Land Degradation, Watershed Management, Remote Sensing, USLE Method, Flood Mitigation

LAND AND SOIL CHARACTERISTICS OF ALLUVIUM GEOLOGICAL FORMATIONS OF THE SEMERU VOLCANO VOLCANIC REGION USING SOIL SURVEY AND GEOGRAPHIC INFORMATION SYSTEM APPROACHES

Basuki[1]*, Affan Rizwanda Adib[1] and Hisyam Azhar Destiawan[1]

[1]Soil Science Study Program, University of Jember

*E-mail: basuki@unej.ac.id

ABSTRACT

Volcanoes have a role in supporting the formation of the earth's surface, land and soil characteristics. Of the 45 active mountains on the island of Java, the most active are Semeru Volcano, Bromo Volcano, Merapi Volcano, Kelud Volcano. Since 1967, Semeru volcano has emitted volcanic material forming an alluvium geological formation with an area of 21.06%. Alluvium plains are formed due to the sedimentation process of the overlying area so that it affects the characteristics of the soil formed, climate, processes, soil types, and suitability of cultivated plants. Spatial development in geographic information systems is currently growing in supporting geographic information including location, point, and area. Efforts to support regional development in geological formations aim to observe land and soil characteristics. Descriptive-explorative method through soil survey approach and geographic information system. The parameters used include climate, land and soil parameters. The results showed that rainfall in the research location averaged 2,250 mm/year, the average temperature was 23.7 oC. Land characteristics, especially land use, are dominated by moorland 60% and rice fields 40%. Soil physical characteristics, especially texture, including sand with a dominant sand fraction of 81 + 3%, dust 17 + 2%, clay 2 + 0.2%, while soil chemical characteristics C-Organic 0.11 + 0.08% (low), Total N 0.12 + 0.08% (low), Available P2O5 20 + 6 ppm P (medium), K+ 0.1 + 0.06 Cmol(+)/kg (low), Ca++ 5 + 1 Cmol(+)/k (medium), Mg++ 1.9 + 0.6 Cmol(+)/kg (medium), Na+ 0.2 + 0.09 Cmol(+)/kg (medium), CEC 11 + 3 Cmol(+)/kg (low), Base Saturation 65.46 + 12 % (high).

Keywords: Land And Soil Characteristics, Alluvium, Volcanics, Soil Survey, GIS

Food Science and Smart Education for Plant Based-Diet

STUDY OF ORGANIC ACID AND CAFFEINE CONTENT OF ARABICA COFFEE BEANS (COFFEA ARABICA) PROCESSING OF THE JAVA IJEN SUKOSARI BONDOWOSO FARMERS GROUP

Ayu Puspita Arum[1]*, Susan Barbara Patricia[1], Oria Alit Farisi[1], Bambang Kusmanadhi[1] and Dyah Ayu Savitri[1]

[1]Agricultural Science Study Program, Faculty of Agriculture, University of Jember, Jember Regency, East Java, Indonesia

*E-mail: ayu.puspita@unej.ac.id

ABSTRACT

Coffee bean processing encourages the formation of flavor precursor compounds such as organic acids, amino acids, sugar reduction, and caffeine content. Some organic acids have health benefits, but caffeine has a triggering effect on cardiovascular disease. This study evaluated the effect of arabica coffee bean processing on the organic acids and caffeine content of Java Ijen Sukosari Bondowoso farmers group arabica coffee beans. This study consisted of surveys and laboratory analysis on blue mountain coffee beans processed naturally (P1) and washed dry hulled (P2) and on Arabica Specialty coffee beans processed naturally (P3) and washed dry hulled (P4). Organic acids (oxalic acid, lactic acid, acetic acid, and butyric acid) and caffeine content were evaluated. The results demonstrated that organic acids were formed after the coffee beans were processed, which were acetic acid and lactic acid with lactic acid content (mg/kg) (P1: 4149.44; P2: 4202.60; P3: 4062.29 and P4: 3401.96) and acetic acid content (mg/kg) (P1: 4751.30; P2: 4479.64; P3: 4737.18 and P4: 4753.33). Meanwhile, the oxalic acid and caffeine content decreased after the coffee beans were processed with oxalic Acid Content (mg/kg) (P1: 544.24; P2: 457.07; P3: 494.28 and P4: 618.11) and caffeine content (P1: 1.18%, P2: 1.26%, P3: 1.17% and P4: 1.24%). Furthermore, butyric acid content was not found in all processed coffee beans. Arabica coffee beans, processed both naturally and washed dry hulled processed, can benefit health because of low caffeine and oxalic acid content but high acetic acid and lactic acid content.

Keywords: Arabica Coffee Beans, Coffee Beans Processing, Organic Acids, Caffeine; Natural, Wash Dry Hulled

DETECTION OF BEEF AND PORK MEATBALLS BASED ON THEIR AROMA USING ELECTRONIC NOSE WITH SENSOR MQ2 AND MQ6

Ahmad Nafi'[1,2], Sholeh Avivi[1], Dian Wahyu Aprilla Durisa[2], Abdul roman[3] and Bambang Kuswandi[4]*

[1]Faculty of Agriculture, University of Jember, Jl. Kalimantan 37, Jember 68121, Indonesia
[2]Faculty of Agricultural Technology, University of Jember, Jl. Kalimantan 37, Jember 68121, Indonesia
[3]Institute of Halal Industry and Systems (IHIS), Gadjah Mada University, Sekip Utara, Yogyakarta 55281, Indonesia
[4]Chemo and Biosensors Group, Faculty of Pharmacy, University of Jember, Jl. Kalimantan 37, Jember 68121, Indonesia

*E-mail: b_kuswandi.farmasi@unej.ac.id

ABSTRACT

Meatballs, typically made with beef as the primary ingredient, are frequently mixed with pork. Hence, it is crucial to create a straightforward, quick, and dependable method to identify this adulteration fraudulent activity. An electronic nose (e-nose) can be used to identify the presence of pork in beef meatballs based on its distinctive aroma. The study aimed to assess the afficacy efficacy of an electronic nose in authenticating halal meatballs. The gas sensors utilized in the electronic nose are the MQ2 and MQ6 sensors. The data was evaluated using descriptive statistics to identify the optimal temperature. Principal component analysis (PCA) was utilized for multivariate analysis to identify and distinguish between beef and pork meatballs. According to the PCA analysis, a heating temperature of 70˚C received a score of 100%. The fact that the e-nose can perceive and distinguish between the aromas of beef and porkpig meatballs is remarkable.

Keywords: Electronic Nose, Halal, Meatball

Smart Social and Polities in Industrial Agriculture

PEASANT' SOCIAL NETWORKS IN IMPROVING THE MARKETING COMPETITIVENESS OF ORGANIC RICE IN CANDIPURO DISTRICT

Adiba Fariza[1*], Joko Mulyono[2], and Wheny Khristianto[3]

[1]Department of Sociology, Faculty of Social and Political Science, University of Jember
[2]Department of Sociology, Faculty of Social and Political Science, University of Jember
[3]Department of Business Administration, Faculty of Social and Political Science, University of Jember

*E-mail: adibafariza@gmail.com

ABSTRACT

Lumajang Regency is one of the major agricultural producers in Indonesia. This study discusses the farming community of Lumajang Regency in Candipuro District who produce and market organic rice. The organic rice farming community in Candipuro District are farmers who have just started marketing their organic rice production. As farmers who are new to marketing their organic rice production, they experience several obstacles in the process. Analysis of the problems faced by organic rice farmers, they need support to improve the marketing of organic rice. One of the main supports in improving the marketing of organic rice is by optimizing the social networks of organic rice farmers. The theory used in analyzing this phenomenon uses the social network theory of Mark Granovetter. The method in this study uses a qualitative method with a phenomenological approach. This study was conducted by direct observation of organic rice farmers, in-depth interviews, and documentation. The results of the study indicate that the social networks of organic rice farmers can increase the competitiveness of organic rice marketing in Candipuro District. The social networks of farmers can help in the production process up to the marketing stage of organic rice. By utilizing social networks effectively, using social media as a place for promotion and sales, and assistance from the government, organic rice farmers are able to optimize the marketing of their rice and attract consumers from around and outside the city to become more aware of the quality and sustainability of organic rice food products.

Keywords: Organic Rice, Peasant, and Social Networks

BANANA PARTNERSHIP SCHOOL AS STRATEGY TO INCREASE THE IMPLEMENTATION OF GOOD AGRIBUSINESS PRACTICES

Luh Putu Suciati[1*], Dewi Prihatini[2], Sudarko[3], Elida Novita[4], Nur Hayati[5], Sigit Prastowo[6], and Rini Purwatiningsih[7]

[1] Agribusiness Study Program, Faculty of Agriculture, University of Jember
[2] Management Study Program, Faculty of Business and Management, University of Jember
[3] Agriculture Extention Study Program, Faculty of Agriculture, University of Jember
[4] Agriculture Technology Study Program, Faculty of Agriculture Technology, University of Jember.
[5] Food Technology Study Program, Faculty of Agriculture Technology, University of Jember.
[6] Plant Protection Study Program, Faculty of Agriculture, University of Jember
[7] Agribusiness Study Program, Faculty of Agriculture, University of Bondowoso

[*]E-mail: suciati.faperta@unej.ac.id

ABSTRACT

The development of the Cavendish banana cluster in Bondowoso district, East Java province, which is collaboration program between a local government and PT Nusantara Segar Abadi (NSA), requires social intervention for farmers implementation. The limited ability to absorb information and community culture to grow bananas commercially requires the support of various parties. The Banana Partnership School is an academic initiative for farmer education of banana good agribusiness practices. The existence of Banana Partnership Schools is a connection among farmer, local government and companies to expand the Cavendish banana planting area. This article aims to analyze (1) the role of the Banana Partnership School in implementing good agribusiness practices and (2) the level of farmer adoption of the Banana Partnership School curriculum. The research method uses qualitative descriptives through observation the activities of Banana Partnership School and scoring analysis through in-depth interviews with banana farmers. The research results show that the role of Banana Partnership Schools includes providing theory and practice of planting Cavendish bananas according to the standards of PT NSA partner companies. The curriculum provided 8 (eight) stages, namely technical guidance related to land preparation, banana planting, banana plantation management, plant management, fertilization methods and plant protection methods, waste management and post-harvest. Farmers' adoption of Cavendish technical curriculum is categorized as quite high with a score of 56.07. The existence of technical guidance through Banana Partnership Schools gives positive impact for farmers with provides potential economic profits between75-90% of the first cost of planting. The suitability of handling cavendish banana cultivation is about 76-89% and the technical application is considered easy to understand and apply on limited land, working time and labor.

Keywords: Banana Partnership School, Good Agribusiness Practices, Cavendish Banana

TRANSACTION COSTS AND INSTITUTIONAL CHOICE: INSIGHTS FROM SUGARCANE FARMERS AT PG SEMBORO SUGAR FACTORY

Joni Murti Mulyo Aji[1*] and Triwila Nindra Putra Perdana[1]

[1]Department of Agribusiness, Faculty of Agriculture, University of Jember 1

*E-mail: joni.faperta@unej.ac.id

ABSTRACT

This study aims to provide insights into the cost efficiency, particularly regarding transaction costs and institutional choices, of sugarcane farmers at the PG Semboro Sugar Factory. Specifically, it analyzes the structure and magnitude of transaction costs associated with credit-partnership institutions and independent institutions. The research includes 73 respondents from a population of 100 sugarcane farmers, with samples determined using cluster sampling and stratified random sampling methods. Analytical tools such as transaction cost analysis and logistic regression analysis were employed. The results reveal that transaction costs encompass monitoring costs of sugar content, Harvesting Loading Transport (TMA) costs, driver costs, foreman harvesting costs, milling queue costs, administrative costs, sack costs, retained capital costs, and document collection costs. Independent institutions incur higher transaction costs at IDR 6,031,937 per hectare compared to credit-partnership institutions at IDR 2,470,565 per hectare, highlighting the greater efficiency of credit-partnership institutions. Transaction costs, along with farming experience and land area, significantly influence farmers' institutional choices, underscoring the critical role of transaction costs in determining institutional preferences.

Keywords: Transaction Costs, Partnerships, Small-Holder Farmers, Sugarcane, Logistic Regression

THE IMPACT OF PARTNERSHIPS AND POTATO FARMERS' PERCEPTIONS OF PARTNERSHIP IN PLAOSAN, MAGETAN

Illia Seldon Magfiroh[1]*, Intan Kartika Setyawati[1], Ratih Apri Utami[1], Ebban Bagus Kuntadi[1] Joni Murti Mulyo Aji[1] and Diny Wulandari[1]

[1]Department of Agribusiness, Faculty of Agriculture, Jember University

*Email: illia.faperta@unej.ac.id

ABSTRACT

The main problems faced by potato farmers in Plaosan District, Magetan Regency are limited capital and high seed prices. Meanwhile, potato prices tend to decrease during the harvest season. Efforts that can be made include establishing a partnership with PT Indofood, with the hope of mutual symbiosis between the two parties. However, the reality on the ground shows that there are still potato farmers who are not involved in partnerships. The purpose of this research is to determine: (1) the impact of partnerships on potato farmers in Plaosan District, Magetan Regency, (2) potato farmers' perceptions of partnerships in Plaosan District, Magetan Regency, and (2) factors that influence the decision of potato farmers to partner in the District Plaosan, Magetan Regency. The research method used in this research is descriptive and analytical, using Likert scale analysis and logistic regression. The sample size was determined using Proportionate Random Sampling with a total of 50 respondents consisting of 25 partner farmers and 25 non-partner farmers. The research results show that the partnership has an impact on increasing the income of partner farmers. The average income of partner farmers is higher than that of non-partner farmers, apart from the partnership with PT. Indofood can reduce the cost of potato seeds. Partner farmers' perceptions of the partnership with PT Indofood are influenced by indicators such as the partnership registration process, pre-partnership information, partnership contracts, and market certainty. In contrast, non-partner farmers' reasons for not participating in partnerships include problems with payment systems for production inputs and outputs as well as harvest sorting systems. Important factors that influence the decision to partner with potato farmers in Plaosan District, Magetan Regency include farming experience, land area, income, price guarantees and market guarantees.

Keywords: Potatoes, Farmer Perceptions, Partnership

EXPLORING THE SOCIAL DIMENSION OF SEAWEED FARMERS IN SUPPORTING SUSTAINABILITY PRACTICES: THE CASE OF EAST JAVA, INDONESIA

Dwi Ratna Hidayati[1]*, Isdiana Suprapti[1]

[1]Agribusiness Department, University of Trunojoyo Madura, Indonesia

*E-mail: dwi.hidayati@trunojoyo.ac.id

ABSTRACT

Ensuring the implementation of the social dimension is critical in developing sustainable practices in the seaweed sector. However, this dimension often receives little attention during development, as economic and environmental aspects have dominated discussion. This paper investigates the role of the social dimension in seaweed production in East Java, focusing on Sumenep and Situbondo Regencies, key seaweed producer area. Two key elements, individual and societal indicators, are examined to understand the social dimension. The study employs qualitative research, gathering data from 45 respondents (seaweed producers and stakeholders). Data from Sumenep Regency and Situbondo Regency were gathered between 2023-2024 using in-depth interviews. The findings highlight the crucial role of social dimension in promoting sustainable practices at both the individual (farming skill, experience, working condition) and societal level (neighbourhood employment, acceptable cultural practice, and farmer group membership). These practices are influenced by the cultural practice, the environment, and chain activities which caused significant differences in both locations. Exploring the social dimension contributes to understanding how to set sustainability interventions based on these characteristics.

Keywords: Social Dimension, Seaweed, Individual, Societal, Sustainability

TECHNICAL EFFICIENCY ANALYSIS OF KASTURI TOBACCO PRODUCTION IN KALISAT DISTRICT, JEMBER REGENCY USING THE STOCHASTIC FRONTIER ANALYSIS (SFA) APPROACH

Titin Agustina[1*], Julian Adam Ridjal[1], Indah Ibanah[1], Rachmat Udhi Prabowo[1], Ariq Dewi Maharani[1], Luh Putu Suciati[1], and M. Rondhi[1]

[1]University of Jember

[*]E-mail: agustina.faperta@unej.ac.id

ABSTRACT

Kalisat District in Jember Regency has the potential to increase Kasturi tobacco productivity, as its productivity is still lower compared to several other districts such as Mayang and Ledokombo. Field conditions indicate that many farmers have not yet utilized production factors correctly, which can impact the production output. This study was conducted to analyze the technical efficiency of Kasturi tobacco farming in Kalisat District. The objectives of this research are to analyze (1) the production factors affecting tobacco farming in Kalisat District, Jember Regency, (2) the level of technical efficiency of Kasturi tobacco farming in Kalisat District, Jember Regency, and (3) the socio-economic factors influencing the technical efficiency of Kasturi tobacco farming in Kalisat District, Jember Regency. The analytical method used is the Cobb-Douglas production function with a stochastic approach. The results of the study show that production factors with a positive and significant effect on Kasturi tobacco production at a 95% confidence level are labor, urea fertilizer, and plant population, while factors with a negative and significant effect at a 95% confidence level are land area, ZA fertilizer, and NPK fertilizer. The average technical efficiency value is 0.795 indicating that there is still a possibility to improve technical efficiency by 20.5%. Factors that have a negative and significant effect on technical inefficiency at a 95% confidence level are age, education, land status, and experience. The findings suggest that better management of tobacco farming is needed to ensure more efficient use of inputs and optimal improvement in Kasturi tobacco production.

Keywords: Technical Efficiency, Tobacco Production, Kasturi Tobacco, Stochastic Frontier Analysis

MARKETING MIX ON THE DECISION TO PURCHASE SERBU COFFEE IN SURABAYA

Gyska Indah Harya[1*], Sri Widayanti[1] and Mubarokah[1]

[1]Department of Agribusiness, Faculty of Agriculture, Universitas Pembangunan Nasional "Veteran" Jawa Timur, 60294, Indonesia

*E-mail: gyskaharya.agribis@upnjatim.ac.id

ABSTRACT

Serbu Coffee Shop Surabaya is one of the coffee shops that is often visited by students. Surabaya Coffee Shop in its marketing has a marketing mix that can influence purchasing decisions. The aims of this research itself are 1). Provide an explanation of how Kopi Serbu uses the 5Ps of marketing. 2). Third, discuss the significance of the research findings and their relationship to the 5Ps of marketing (which relate to sales of Serbu Coffee in Surabaya). The analysis method is Partial Least Square (PLS) using the SMART - PLS 4.0 program to analyze the Structural Equation Model (SEM). This research obtained data from questionnaires, interviews and observations of 50 samples selected based on accidental sampling. The results of this research are 1) Kopi Serbu has successfully used the 5Ps of marketing: product, price, location, promotion and people. 2) A p-value smaller than 0.05 indicates that the price variable has a significant effect on Kopi Serbu customers' purchasing choices. The p values for the other variables—product, location, promotion, and employee/person—are more than 0.05 and 3, respectively, indicating that these variables do not have a significant impact on purchasing choices for Kopi Serbu products. The implications of the research results occur in the price variable because the prices at Kopi Serbu are very affordable and pocket-friendly for students.

Keywords: Marketing Mix, Purchase Decision, SEM-PLS

STRATEGIC RISK MANAGEMENT IN RED CHILI PRODUCTION: APPLICATION OF THE HOUSE OF RISK MODEL

Ati Kusmiati[1*], Safira Salsabila[1], Rizky Yanuarti[1], Evita Soliha Hani[1], Agus Supriono[1], Yuli Hariyati[1], Ahmad Zainuddin[1], Rena Yunita Rahman[1] and Suwali[1]

[1]Department of Agribusiness Faculty of Agriculture University of Jember

*E-mail: ati.faperta@unej.ac.id

ABSTRACT

Srono District was one of the areas in Banyuwangi Regency with the highest red chili production from 2018 to 2022. However, the production of red chili often fluctuates, leading farmers to plant red chili throughout the year. Farmers who grow red chili year-round face a variety of risks that could lead to crop failure. Therefore, this study aimed to identify the risks in red chili cultivation and determine management strategies to minimize these emerging risks. The House of Risk (HOR 1) method was used to identify risk agents and formulate risk management strategy priorities (HOR 2). A total of 31 respondents were selected using the simple random sampling method, and structured interviews were conducted with them. The results of the study showed that there were 23 sources of risk in red chili cultivation, with 6 prioritized risk agents that need to be considered. The top priority risk agent that must be addressed immediately is weather uncertainty. There were 7 recommended risk management measures to minimize or reduce the occurrence of prioritized risk sources. The main priority for risk management was to carry out intensive maintenance of red chilies. Proper risk management could maintain the stability of red chili production.

Keywords: Red Chili, Risk Identification, Risk Management Strategy, House of Risk

SUGARCANE FARMERS' KNOWLEDGE AND IMPLEMENTATION OF GOOD AGRICULTURAL PRACTICES IN REJOSARI VILLAGE BANTUR DISTRICT MALANG REGENCY

Julian Adam Ridjal[1*], Atik Qima Ulviyah Mawaddah Rohmaniyah[1], Soetriono[1], M. Rondhi[1] and Tri Candra Setiawati[1]

[1]The University of Jember

[*]E-mail: adam.faperta@unej.ac.id

ABSTRACT

Good Agricultural Practices (GAP) of sugarcane is a guideline for good sugarcane cultivation to pursue the acceleration of national sugar cane production. This study aims to identify (1) the knowledge level of GAP among sugarcane farmers in Rejosari Village, (2) the implementation level of GAP among sugarcane farmers in Rejosari Village, and (3) the differences between knowledge and implementation of GAP among sugarcane farmers in Rejosari Village. The research method using descriptive quantitative with analysis method using Likert scale scoring and paired sample t-test. The results showed that (1) the knowledge level of the GAP among sugarcane farmers in Rejosari Village resulted in a value of 54,50, that means the knowledge level of the GAP among farmers belong to the low category, (2) the implementation level of the GAP among sugarcane farmers in Rejosari Village resulted in a value of 73,74, that means the implementation level of the GAP among farmers belong to the medium category, and (3) there is a significant difference between the level of knowledge and implementation of the GAP among sugarcane farmers in Rejosari Village. Farmers have a tendency to do traditional sugarcane cultivation according to their informal knowledge obtained from the environment around the farmer.

Keywords: Knowledge, Implementation, Good Agricultural Practices Of Sugarcane

THE CHALLENGES OF REVITALIZING THE UPSTREAM SECTOR OF THE PLANTATION WHITE SUGAR INDUSTRY IN EAST JAVA PROVINCE

A A Rachmadhan*, N Rizkiyah, Hendrarini H, Indah P N

Agribusiness Study Program, Faculty of Agriculture, UPN "Veteran" Jawa Timur

*E-mail: aditya.arief.rachmadhan.fp@upn.ac.id

ABSTRACT

All Revitalizing the upstream sector of the plantation white sugar industry in East Java Province is the key to increasing sugar production in Indonesia. This upstream sector of this industry produces sugarcane as raw material for sugar factories. This research aims to identify the challenges in revitalizing the upstream sector of the plantation white sugar industry in East Java Province. The research methods used in this research are systematic literature review (SLR) and system analysis. Revitalizing the upstream sector of the plantation white sugar industry in East Java Province cannot be separated from the significant challenges of: (1) increasing sugarcane production and rendemen of smallholder farmers, and (2) enhancing institutions. The programs to increasing sugarcane production and rendemen must focus on: (1) improving the quality of sugar cane seedling, and implementing ideal planting patterns as recommended, (2) enhancing soil conditions, and (3) optimizing cutting-loading-transporting processes. As sugestion, revitalization must begin with enhancing partnerships between sugar factories and smallholder farmers.

Keywords: Food Security, Partnership, Revitalization, Sugar Industry

SOCIAL AND ECONOMIC LABOR ANALYSIS OF GENDER-BASED TOBACCO COMMODITIES IN THE LUMAJANG REGION

Djoko Soedjono[1], Soetriono[1], Dimas B. Zahrosa[1], Cindera R. Damascena[1]* and Anik Suwandari[1]

[1]Universitas Jember

*E-mail: 19930711202321203 6@mail.unej.ac.id

ABSTRACT

The plantation subsector in agriculture plays a crucial role in rural employment absorption, with tobacco being a major commodity contributing significantly to the national economy. Controlled tobacco farming aims to maintain economic, social, and environmental stability while meeting market demand. This research examines the socio-economic aspects of gender-based employment in the tobacco sector, focusing on labor absorption, work hours, wages, and payment systems in tobacco and non-tobacco farming in Lumajang, East Java. Using a descriptive method, this study sampled 86 tobacco farmers (43 landowners and 43 laborers). Data analysis employed quantitative descriptive methods and labor wage analysis. Findings reveal higher female labor involvement in tobacco farming, with women's work hours exceeding men's in the tobacco seedling stage. Wage disparities were found, with women's wages consistently lower due to different job types and workloads. Wage systems in tobacco farming include post-completion payments, advance payments, and bonuses. This research highlights the critical role of tobacco in the local economy and the persistent gender wage gap in agricultural labor.

Keywords: Socio-Economic Analysis, Employment, Gender-Based, Tobacco Sector

SYSTEM MODEL SIMULATION OF SOYBEAN PRODUCTION IN INDONESIA

Edi Paryanto[1*], Muhamad Harisudin[2], Joko Sutrisno[3] and Kusnandar[4]

[1]Doctoral Programme of Agricultural, Agricultural Faculty, Sebelas Maret University
[2,3,4]Agricultural Faculty Sebelas Maret University

*E-mail: edi.paryanto@staff.uns.ac.id

ABSTRACT

Indonesia is one of the largest importers of soybeans in the world because domestic production is not enough to meet domestic demand for soybeans. Domestic production conditions continue to fall, so the government imports soybeans from abroad to meet the national supply. These problems must be understood so that the driving factors that cause these problems are known. In this study, we developed a system dynamics model to visualize the soybean production system. The researchers' simulation model represented the soybean production system in 2000-2022. In conditions without policy, soybean production in Indonesia will be 192,070 tons in 2043. Production of this size cannot meet the demand for soybeans, which reached 3,645,400 tons in 2043. Resolving these issues requires several steps to obtain the expected solution. The policy scenarios implemented were a) a scenario without policy (optimistic scenario), b) a scenario of increasing productivity, c) a scenario of increasing harvest area policy, and d) a combination scenario of increasing productivity and harvest area simultaneously. Of the several scenarios tested in the simulation model, the combination scenario of increasing productivity by 3 tons/ha and increasing soybean harvest area by 35% per year is the policy scenario that will quickly increase production. Simulation output data shows that soybean production can reach 3,670,510 tons to meet the demand for soybeans in 2029.

Keywords: Soybean, Production, Dynamic Systems, and Policy Scenarios

TECHNICAL EFFICIENCY OF SMALLHOLDER COFFEE FARMERS IN SITUBONDO: A STOCHASTIC FRONTIER APPROACH

Sulistyaningsih[1], Puryantoro[1*], Fitriyaningsih[1]

[1]Faculty of Agriculture, Science and Technology, University of Abdurachman Saleh Situbondo, Situbondo, Indonesia

*E-mail: puryantoro@unars.ac.id

ABSTRACT

Coffee as a commodity that is influential in world trade is one of the commodities that is considered the amount of production so that the demand for coffee can be met by farmers, so it is necessary to pay attention to how farmers use the technology so that it can provide high efficiency. Based on this urgency, this study analyzes the factors that influence the technical efficiency of Arabica coffee farmers. To conduct this analysis, a translog stochastic production frontier function, in which the effects of technical inefficiency are specified as a function of socioeconomic variables, was estimated using the maximum likelihood method. The data used was collected from a sample of 40 farmers in Situbondo district during the 2023 crop year. The results obtained indicated an inefficiency of thirteen percent. The analysis also revealed that farmers' education level and number of family members are the main socioeconomic variables that affect farmers' technical inefficiency. The number of family members has a noticeable influence on increasing technical inefficiency. A surprising finding in the results of this study was the variable of farmers' level of education, because empirically, the higher the education, the higher the knowledge of farmers to do coffee farming well and thus become more technically efficient. However, this was not the case in this study. Farmers with higher education no longer make coffee farming their main job because there is not enough time, mind, and energy for coffee farming activities.

Keywords: Technical Efficiency, Arabica Coffee, Stochastic Frontier

DETERMINANT FACTORS OF BROILER CHICKEN PERFORMANCE WITH PARTNERSHIP SYSTEM

Amam Amam[1]*, Mochammad Wildan Jadmiko[1], Pradiptya Ayu Harsita[1], and Amir Sofwan Alwafa[1]

[1]Department of Animal Husbandry, Faculty of Agriculture, Universitas Jember, Indonesia

*E-mail: amam.faperta@unej.ac.id

ABSTRACT

The Performance Index (IP) is the achievement value of plasma farmers in running a partnership system broiler chicken farming business. The aim of the research is to examine the determinant factors that influence IP values. This research involved 129 farmers with a core plasma partnership system operating in January – March 2024. Primary data collection was carried out using observation and survey methods. The survey was conducted in 2 (two) ways, namely an oral survey using interviews and a written survey using questionnaires. Apart from that, this research also uses secondary data in the form of Recapitulation of Chicken Rearing Results (RHPA) reports from core companies. The research results showed that the performance index value was significantly positively influenced by the number of harvests of 2,432 and the average harvest weight was 2,539, but was also significantly negatively influenced by the amount of feed of -1,929, depletion of -2,016, and Feed Consertion Ratio (FCR) of -1,967. Apart from that, there is a very strong correlation between the performance index and farmer income of 0.931. The research conclusion was that the amount of feed (kg), depletion (tails), number of harvests (tails), average harvest weight (kg), and FCR greatly determine the performance index value of broiler chicken farming. Apart from that, the higher the performance index value, the greater the income of broiler chicken farmers.

Keywords: Broiler, Partnership System, Performance Index, Plasma Core Partnership, Production Factors

AWARENESS OF HEALTHY LIVING AND ABILITY TO PAY TOWARDS THE DECISION TO BUY ORGANIC VEGETABLES IN TASIKMALAYA CITY, INDONESIA

Candra Nuraini[1*], Rina Nuryati[1], Eri Cahrial[1], Betty Rofatin[1], Enok Sumarsih[1]

[1]Faculty of Agriculture, University of Siliwangi

[*]E-mail: candranuraini@unsil.ac.id

ABSTRACT

Public awareness to live healthier has have reflected in food consumption behavior that has turned towards the consumption of organic vegetables. However, the assumption that the price of organic products is more expensive is still a discussion in the organic product market. The purpose of a decision-making research on purchasing organic vegetables was to analyze the factors that are considered by consumers in purchasing organic vegetables. The research method applied was binary logistic regression. Ouput from logit modeling explained the factors that influence purchases, such as education level, income, distance from home to the outlet, and knowledge of nourishment. Consumers who did not hesitate to buy organic vegetables got the knowledge that organic vegetables were safer to consume and support the body's metabolism to be healthier. Consumers understood that organic vegetables were free from pesticides, thus avoiding the threat of serious illness from chemical residues. Repeat purchases occured for consumers who had an income of more than IDR 3,000,000. The price of organic vegetables was tending to be inelastic because consumers did not pay much attention to price increases and were more concerned with the need to achieve a healthy body. Organic vegetables were rarely found in traditional markets because they required special treatment to make them last longer, such as refrigeration. In addition, consumers were willing to pay more for the product due to the better appearance of the product compared to products in traditional markets and the perceived benefits of consuming organic vegetables.

Keywords: Consumption, Logit, Organic, Preference, Vegetable

SUSTAINABILITY STATUS OF PEOPLE'S LIVESTOCK SCHOOL IN LAMONGAN DISTRICT

Nadya Asima Gravita[1*], Muladno[1], Bramada Winiar Putra[1] and Mangasi Panjaitan[2]

[1]IPB University, Bogor. Indonesia
[2]Trilogy University, Jakarta. Indonesia

*E-mail: npanjaitan7@gmail.com

ABSTRACT

The pattern of livestock business, especially beef cattle in Indonesia, is still dominated by small-scale farms or smallholder farms. One of the efforts to improve livestock business is the establishment of Sekolah Peternakan Rakyat (SPR), which is expected to be a medium for transferring technological innovations to improve the quality of human resources of farmers. The study was conducted by conducting a structured survey of 30 respondents in the management of "Solidaritas Alumni Peternakan Rakyat Indonesia (SASPRI)" in 3 sub-districts (Sambeng, Ngimbang, and Sukorame) in Lamongan District, East Java Province. Data were analyzed using Multidimensional Scaling of Rap-Cattlefarm (MDs) with six dimensions and 46 attributes. The results of the analysis showed that the SPR program carried out in 2023, which then in 2024 changed to SASPRI, had a significant impact on change. Leverage analysis of 16 characteristics showed an influence on the long-term sustainability of cattle farming with the SASPRI model. The sustainability of cattle farming in 3 sub-districts requires capital support and partners to strengthen sustainable business development. All dimensions show a strong enough effort for sustainability. The weakness of the study is that the sustainability analysis was conducted only in areas with good and sufficient status, so research is needed on SASPRI that is classified as not good enough to see which dimensions are the difference between the three SASPRI statuses.

Keywords: People's Livestock School, Sustainability, Beef Cattle

Smart Business for Agriculture and Healthy Food

INCOME STRUCTURE, EXPENDITURES AND WELFARE LEVEL OF HORTICULTURE FARMER HOUSEHOLDS IN NGADISARI VILLAGE, WITH FARMER HOUSEHOLD INCOME EXCHANGE RATE (NTPRP) APPROACH

Yuli Hariyati[1]*, Putri Aurelia Angelica[1]

[1]Departement of Agribusiness, Faculty of Agriculture, University of Jember

*E-mail: yuli.faperta@unej.ac.id

ABSTRACT

Ngadisari Village is one of the villages located in Sukapura District, Probolinggo Regency which is an economic strategic area due to the high level of horticultural cultivation and rapidly growing tourism activities. Ngadisari village is dominated by the Tengger tribe community who still adhere closely to traditions. Preparation and implementation of traditional ceremonies of the Tengger tribe influence the level of household expenditure, while farming activities, tourism or other businesses carried out influence the level of household income. The level of household income and expenditure is closely related to the level of household welfare. This research aims to determine the structure of farmer households' income, expenditure and level of welfare as measured by the concept of Farmer Household Income Exchange Rate (NTPRP). This research uses descriptive methods and quantitative analysis. The research results showed that most household income comes from agricultural activities, especially farming. Most household expenses are used to fulfill agricultural production factors and savings are intended for traditional and traditional ceremonies. Most horticultural farmer households have an NTPRP > 1 so they can be categorized as prosperous.

Keywords: Income, Expenditures, Household, Farming, Welfare

THE INFLUENCE OF LAND CERTIFICATION, ACCESS TO CREDIT, AND INSTITUTIONS ON LAND TRANSFERS IN EAST JAVA PROVINCE

M. Rondhi[1*], Dea Ananda Dwi Pratiwi[1], Ratih Apri Utami[1], Rizky Yanuarti[1], Yasuhiro Mori[2], Masako Morioka[3]

[1]Departement of Agribusiness, Agribusiness Study Program, Faculty of Agriculture, University of Jember
[2]Rakuno Gakuen University, Ebetsu, Japan
[3]Obihiro University, Hokkaido, Japan

*E-mail: deaanandadwipratiwi@gmail.com

ABSTRACT

Population growth in developing countries continues to increase by year, will threaten agricultural land availability. The way to have land access are transferring land through a rental system. The transfer maintains their livelihoods and in turn can maintain national food security. The purpose of this study is to determine the condition of land transfers and factors affecting land transfers in East Java Province. The research applied mix method. This research used data from the 2014 Agricultural Household Income Survey (SPP) of 43,130 respondents. The condition of land transfer in East Java Province was analyzed using descriptive analysis and the factors affecting land transfer were analyzed using binary logistic regression analysis with 11 variables. The results of the analysis showed that 1) the transfered land in East Jawa accounted to 36.1%, and the rest did not make land transfers accounted for 63.9%. 2) Factors that significantly and positively influence land transfer are access to credit, farmer group membership, the role of extension workers, cooperatives participation, total household income, gender, number of family members, land in another party, and own land. Other factors that significantly and negatively affect land transfer activities in East Java Province are land titles and farmer age. This research suggest to governerment to increase farmer credit access.

Keywords: Land Transfer, Land Certification, Credit Access, Institutionalization

DO MARKETING CAPABILITY AND DIGITAL CAPABILITY INFLUENCE MODERN COFFEE SHOPS' COMPETITIVE ADVANTAGE?

Wheny Khristianto[1]*, Achmad Haidar Muchid[1], Djoko Poernomo[1]

[1]Department of Business Administration, Faculty of Social and Political Science, University of Jember

*E-mail: wheny.fisip@uneja.cid

ABSTRACT

The emergence of various types of coffee shops in Indonesia has made the intensity of business competition even higher. To achieve competitive advantage in the digital era, various efforts are made by coffee shops. One strategy to maintain competitive advantage is to optimize marketing and digital capability. This research aims to prove the influence of marketing capability and digital capability on the competitive advantage of modern coffee shops. Data collection techniques use structured questionnaire. The population in this study is modern cofffee shops located in Jember Regency, Indonesia with the characteristics of using Gojek, Grab and Shopeefood platform services with a rating above 4-score. The sampling method uses census sampling. The sample carried out from 36 modern coffee shop managers in three main districts: Sumbersari, Patrang and Kaliwates. Data analysis was carried out using structural equation model with partial least squares (SEM-PLS) approach. The results show that partially marketing capability has a significant positive influence on competitive advantage, but digital capability does not have a significant positive influence on competitive advantage. This research contributes to the existing literature on the competitive advantage of modern coffee shops by highlighting marketing capability and digital capability as antecedent variables. The integration of research variables from a dynamic capabilities' perspective is news in this research that is still rarely used. In the future, this research needs to be expanded in terms of the number of samples and research areas.

Keywords: Indonesia, Coffee Shop, Digital Capability, Marketing Capability, Competitive Advantage

ANALYSIS OF THE INFLUENCE OF MARKETING MIX ON PURCHASING DECISIONS AND CONSUMER SATISFACTION OF BROILER CHICKEN MEAT IN KARANGJATI, NGAWI

Fredyana C Bianto[1], Illia Sheldon Magfiroh[1]*, Titin Agustina[1] and Ratih Apri Utami[1]

[1]Departemen of Agribusiness, Faculty of Agriculture, University of Jember

*E-mail: illia.faperta@unej.ac.id

ABSTRACT

Broiler chicken is the most widely consumed livestock commodity in Indonesia. Broiler chickens in the Karangjati District are primarily marketed through traditional markets. The marketing mix is a crucial marketing tool influencing consumer purchasing decisions and satisfaction. This study aims to identify consumer characteristics, assess the impact of the marketing mix on purchasing decisions, and examine its effect on consumer satisfaction. The study sample included 60 individuals selected through accidental sampling. Primary data were collected through interviews conducted by researchers at Sembung Market, Karangjati Market, and Samben Market. The data analysis methods employed were descriptive analysis and SEM-PLS analysis using Smart-PLS 3. The findings of the study are as follows: (1) Broiler meat consumers in Karangjati Subdistrict are predominantly women aged 21-30 years with a high school education, working as housewives, and earning an average income ranging from Rp 1,000,000 to Rp 3,000,000; (2) Marketing mix variables—product, price, and place—significantly influence broiler meat purchasing decisions, whereas promotion variables do not; (3) Price and purchasing decision variables significantly affect broiler meat consumer satisfaction, whereas product, place, and promotion variables do not significantly influence satisfaction

Keywords: Broiler Chicken, Marketing Mix, Purchasing Decisions, Consumer Satisfaction

EVALUATING THE SUPPLY CHAIN AND VALUE CHAIN OF INPARI NUTRIZINC RICE IN JEMBER REGENCY TO MITIGATE STUNTING

Indah Ibanah[1]*, Titin Agustina[1], Julian Adam Ridjal[1], Luh Putu Suciati[1], M. Rondhi[1], Rachmat Udhi[1]and Ariq Dewi Maharani[1]

[1]University of Jember

*E-mail: indahibanah.faperta@unej.ac.id

ABSTRACT

This study aims to analyze the supply chain of NutriZinc rice in Jember Regency and its impact on reducing stunting rates. NutriZinc rice is a biofortified variety enriched with zinc, crucial for child growth and development. The research examines various stages of the supply chain, including production, distribution, and consumption, to identify key factors affecting efficiency and effectiveness. Data were collected through field surveys, interviews with farmers, distributors, and consumers, as well as secondary data from relevant authorities. A mixed-method approach was employed, involving both quantitative and qualitative analyses. The quantitative analysis evaluated the supply chain of NutriZinc rice from seed production to final consumer distribution, while qualitative analysis involved in-depth interviews with stakeholders to understand the dynamics and challenges present. The findings indicate that the supply chain consists of two main channels and involves three flows: information, product, and financial. The first channel includes seed breeders, the agricultural department, agricultural extension centers, farmers, collectors, rice mills, retailers, and consumers. The second channel is similar but includes large rice mills handling packaging and grading before selling to retailers. Challenges identified include limited access to high-quality seeds, inadequate infrastructure, and a lack of awareness among farmers about optimal cultivation practices. Despite these challenges, integrating NutriZinc rice into local diets has shown promising results in improving zinc intake among children, contributing to a reduction in stunting rates. The study concludes with recommendations to enhance supply chain efficiency, such as improving seed distribution systems, providing training for farmers, and increasing public awareness about NutriZinc rice's nutritional benefits. These measures are essential for ensuring the sustainability and scalability of NutriZinc rice production and its role in public health interventions aimed at combating stunting in Jember Regency.

Keywords: Stunting, Rice, Inpari, Nutrizinc, Supply Chain

RELATIONSHIP BETWEEN CLIMATE CHANGE ADAPTATION STRATEGY AND COCOA FARMING PRODUCTIVITY IN TRENGGALEK

Yuli Hariyati[1]*, Vina Yunita Ria[1], and Wafik Aziza Nur Aini[1]

[1]Departement of Agribusiness, University of Jember, Indonesia

*E-mail: yuli.faperta@unej.ac.id

ABSTRACT

Climate change causes changes in rainfall that negative impact the sustainability of agricultural commodities, one of which is the cocoa plant. Climate change in Suruh Village, namely high rainfall (La Nina) and prolonged drought (El Nino), caused cocoa production to decrease by 66,66% in 2022. This research aims to 1) identify the adaptation strategies of cocoa farmers in dealing with climate change; 2) the level of cocoa farming productivity; and 3) the relationship between climate change adaptation strategies and the level of cocoa farming productivity in Suruh Village, Trenggalek Regency. The research methods used include descriptive analysis, productivity analysis, and pearson correlation. The results of the study show that 1) There are seven climate change adaptation strategies employed by cocoa farmers in Suruh Village, namely the creation of worm castles, rorak, ant nests, spraying of botanical pesticides, increasing the use of organic fertilizers, pruning management, and cocoa bagging with an adaptation level categorized as high, because the percentage of farmers who have implemented the above adaptation forms is above average (69%) which is 83 out of 111 farmers; 2) The average productivity of cocoa farming in Suruh Village is 0.54 tons/hectare/year which is included in the moderate category; 3) The relationship between climate change adaptation strategies and the level of cocoa farming productivity in Suruh Village, Trenggalek Regency is 0.740, which means it has a strong correlation with a positive and significant relationship direction.

Keywords: Cocoa, Climate Change Adaptation Strategies, Productivity, Pearson Correlation

ADAPTATION OF HOME GARDEN-GROWN GARUT TO LIGHT AND ORGANIC FERTILIZER: HOME GARDEN INITIATIVES AND PRACTICES FOR LOCAL FOOD SUSTAINABILITY

Arry Y Nurhayati[1]*, Azzizatur Rohmah[1], Yuda C Hariadi[2], M Hasan[2] and Sigit Soeparjono[2]

[1]Physics Department Mathematics and Natural Sciences University of Jembe, Indonesia
[2]Mathematics Department, Faculty of Mathematics and Natural Sciences University of Jember, Indonesia
[5]Faculty Agriculture University of Jember, Indonesia

*E-mail: arry.fmipa@unej.ac.id

ABSTRACT

In Indonesia, the importance of home garden initiatives and practice for local food sustainability is emphasized by the government's commitment to accelerate diversification for alternative carbohydrate food sources beyond rice and wheat flour. These initiatives align with the UN Sustainable Development Goals (SDGs) which aim to enhance local food resilience during uncertain times and crises, such as pandemics, when there is an increasing interest to produce food locally. Garut (*Maranta arundinacea* L.) is a home garden plant that is underutilized as a carbohydrate source. This study assessed the adaptation of Garut as home garden-grown plants to light intensity and enrichment with organic fertilizer integration. Selected plants with uniform growth were treated with variations of light intensities and three variations organic fertilizer from mixtures of husk, charcoal, rice straw and cow dung in varying dose. It was found that light-intensity had effect on the total leaf area as well as the dose of fertilizer. In stem diameter growth, light-intensity between (37.39±14.73) lux to (13523.036±1184) lux and fertilizer dose of 150 grams gave optimal results. It is summarized that home garden-grown Garut is adaptable to a variety of light intensities while plant growth was further enhanced with organic fertilizer integration. In addition, the potential of Garut for home garden initiatives and practices is also highlighted in terms of food sustainability.

Keywords: Garut, Light intensity, Sustainability, Home Garden, Organic-fertilizer

THE CORRELATION BETWEEN EXPORT VOLUME AND TRAINING RECIPIENTS: STRENGTHENING E-COMMERCE IN THE AGRICULTURAL SECTOR

Agus Supriono[1], Rizky Yanuarti[1]*, Evita Soliha Hani[1], Yuli Hariyati[1], Rena Yunita Rahman[1], Ahmad Zainudin[1], and Suwali[1]

[1]Department of Agribusiness, Faculty of Agriculture, University of Jember, Jember, Indonesia

*E-mail: rizkyyanuarti@unej.ac.id

ABSTRACT

This study examines the correlation between export volume and training recipients in Indonesia using Pearson correlation analysis. Results indicate a moderate positive correlation coefficient of 0.5225, significant at the 0.05 level with a p-value of 0.0015, based on data from all 34 provinces. This suggests that increased training enhances export capabilities, highlighting the importance of human capital development for economic performance. Despite only 0.85% of e-commerce businesses reaching international markets, significant potential exists for growth. Strengthening e-commerce through training and mentoring is crucial for enabling local businesses to navigate international trade complexities and improve digital competencies. In the agricultural sector, e-commerce integration improves supply chain efficiency and market access, benefiting producers and consumers. Initiatives like Gojek's GoShop and Grab's GrabMart demonstrate growing integration, yet food, beverages, and agricultural products only account for 5.37% of e-commerce trade volume, indicating growth potential. The link between employment absorption and e-commerce income shows that digital platform expansion creates job opportunities, contributing to higher household incomes and economic stability. Income from e-commerce in the agricultural sector is mainly generated by small businesses earning less than IDR 300 million, while large enterprises are limited. Additionally, the 2022 e-commerce workforce distribution reveals regional disparities, with the highest concentrations in economic hubs like West Java and East Java, underscoring the need for targeted support to develop e-commerce capabilities in less developed areas.

Keywords: E-Commerce, Pearson Correlation, Economic Income

URBAN FARMING BUSINESS MODEL: A COMPARATIVE STUDY BETWEEN SOUTH JAKARTA-INDONESIA AND ISTANBUL-TURKEY

Lorenta In Haryanto[1]*, Ade Sumiahadi[2] and Mithat Direk[3]

[1]Agribusiness, Faculty of Agriculture, University of Muhammadiyah Jakarta, South Tangerang, Indonesia
[2]Agrotechnology, Faculty of Agriculture, University of Muhammadiyah Jakarta, South Tangerang, Indonesia
[3]Agrotechnology, Agricultural Economics, Faculty of Agriculture, Selçuk University, Konya, Turkiye

*E-mail: lorenta@umj.ac.id

ABSTRACT

The differences between food production centres in the countryside and the conditions prevalent in urban areas have motivated urban communities to devise agricultural models specifically tailored to the urban environment. This research aims to identify the strategies that agricultural entrepreneurs can employ to adapt competitively in the urban business environment and analyse the efficacy of the Business Canvas Model to determine the performance of urban farming businesses from an economic and social perspective. This study will investigate the condition of urban farming in the metropolitan cities of Indonesia and Turkey across different regions. This study employs a qualitative research technique design utilising a case study technique. The analytical technique utilised is the Business Model Canvas (BMC). Observations were conducted on farmers and farm traders selected through random and purposive sampling, specifically targeting individuals with a commercial focus rather than those pursuing farming as a hobby. This study focus on South Jakarta City and Istanbul's urban farming views. The research employs a literature review method utilising Michael E. Porter's competitive advantage approach. The Business Canvas Model was created by observing, conducting FGDs, interviews, and reviewing documents. This study focuses on individuals and institutions involved in urban farming using a commercial or profit-oriented approach. There are no limitations on the sample size; however, the business sector focuses on food and horticulture. The results reveal three urban farming strategies in South Jakarta and Istanbul: low-cost specialisation, differentiation, and diversification. The low-cost specialised business model is prevalent in South Jakarta City and Istanbul.

Keyword: Business Canvas Model, Competitiveness, Diversification, Urban Farming

THE EFFECT OF FINANCIAL INCLUSION ON AGRICULTURAL PRODUCTION IN INDONESIA

Ciplis Gema Qori'ah[1]*, Adhitya Wardhono [1], M. Abd. Nasir[1], Selvi Maqfiroh[2]

[1]University of Jember
[2]PT Pusat Riset Sosial dan Ekonomi Indonesia

*E-mail: ciplis.qoriah@unej.ac.id

ABSTRACT

The agricultural sector plays a vital role in the Indonesian economy, but still faces challenges in terms of productivity and access to financing. The phenomenon that is attracting attention is the increasing penetration of technology and government initiatives in encouraging financial inclusion, especially through the People's Business Credit or *Kredit Usaha Rakyat* (KUR) program. However, the impact of financial inclusion on agricultural production is not yet fully understood. This research analyzed the effect of financial inclusion on increasing agricultural production in Indonesia from 2007 to 2023. The main focus of the research is how agricultural production can increase the number of KUR recipients, the amount of KUR funds distributed, and KUR interest rates. Observed phenomena include farmer financial literacy, expanding access to agricultural financial services, and changes in agricultural financing patterns. Using time series data and the Generalized Method of Moments (GMM) methodology, this research aims to test the hypothesis that increasing the number of recipients and KUR funds disbursed by financial institutions contributes positively to increasing agricultural production, while lower KUR interest rates tend to support credit accessibility which is better for farmers. The results of this research provided insight into the effectiveness of digital financial inclusion in encouraging productivity in the agricultural sector in Indonesia. These findings can provide a basis for policy makers in designing more effective strategies to increase financial access and productivity in the agricultural sector, as well as optimize the role of digital technology in rural economic development.

Keywords: Finansial Inclusion, Agricultural Production, Credit

STUDY OF THE VALUE CHAIN FOR SOYBEAN IN INDONESIA

Febrian Ananta Kahar [1]*, Adhitya Wardhono [2], Iryono[1], Mela Yunita[1]

[1]PT Pusat Riset Sosial dan Ekonomi Indonesia 1
[2]Faculty Economics and Business, University of Jember 2

*E-mail: febrian.a.kahar@gmail.com

ABSTRACT

The complexity of soybean issues in Indonesia remains very high, ranging from competitiveness problems to price and productivity issues. One way to evaluate these problems is from the soybean value chain perspective. A value chain model analysis can provide an overview of the flow of goods, added value, and profits for each actor involved in soybean production. Therefore, this study aimed to analyze the value chain of soybean commodities in Indonesia. The soybean value chain analysis was approached by analyzing the agents involved in soybean production in Jember Regency as a representative of Indonesia. The results showed that the actors or agents involved in soybean production and marketing include input suppliers, producers (farmers), wholesalers, retailers, and tofu and tempeh entrepreneurs or craftsmen. The level of soybean marketing channels in this region consists of three routes. Furthermore, it can be explained that the soybean marketing chain in Jember Regency is quite short. This indicates that the marketing chain in this region is quite efficient. However, several problems were still found, such as transaction cost efficiency, traditional marketing, and institutional issues that need to be resolved.

Keywords: Soybean, Value Chain, Market Efficiency

DEVELOPMENT OF URBAN FARMING IN THE CITY OF SURABAYA WITH BUSINESS INNOVATION: BMC MODEL (BUSINESS MODEL CANVAS)

Nuriah Yuliati [1]*, Eko Nurhadi[1], Stevi Putri Adolvina Baik [1] and Dita Atasa[1]

[1]Universitas Pembangunan Nasional "Veteran" Jawa Timur, Jl. Rungkut Madya No.1, Kec. Gunung Anyar, Kota Surabaya

*E-mail: dita.atasa.agribis@upnjatim.ac.id

ABSTRACT

Urban farmers create creative ways in the form of entrepreneurial innovation to develop urban farming. Women Farming Groups (KWT) and Farmer Groups (Poktan) can become profitable businesses because of higher quality human resources and production quality orientation. The research objective is to analyze urban farming business innovation in the city of Surabaya using the BMC (Business Model Canvas) model. The research was carried out on 5 Women Farmer Groups (KWT) and Farmer Groups (Poktan) in the City of Surabaya, namely, Guyub Rukun Farmer Women Group, Yurga Farm Farmer Group, Serpis Farmer Group, Sri Rejeki Jitu Farmer Group, and Dorang Cinta Farmer Woman Group. The analysis used is qualitative analysis by describing the stages of innovation with business models on the 9 Business Model Canvas (BMC). Research using qualitative methods was used in 5 KWTs and Poktans. Therefore, key informants were selected from each chairman of the KWT and Poktan. The results of the research were that KWT Guyub Rukun received the lowest revenue and Poktan Serpis received the highest revenue. This is because the revenue flow only comes from the sale of harvested crops and only has one main partner. The development of an urban farming business using the BMC (Business Model Canvas) model can be used by business people as a basis for developing strategies and taking steps to develop better so that with BMC they can discover the advantages and disadvantages of each KWT and Poktan.

Keywords: Urban Farming, Business Innovation, and Business Model Canvas (BMC)

EFFECTIVENESS OF MONETARY POLICY INSTRUMENT IN SUPPORTING OF AGRIBUSINESS FINANCIAL SECTOR IN INDONESIA

M. Abd. Nasir [1]*, Adhitya Wardhono[1], Ciplis Gema Qori'ah[1], Intan Fauza Az-zahra[2]

[1]University of Jember
[2]PT Pusat Riset Sosial dan Ekonomi Indonesia

*E-mail: abd.nasir@unej.ac.id

ABSTRACT

The agribusiness sector has a strategic role in the Indonesian economy. This sector has demonstrated consistent resilience to various economic crises. Through the monetary policy framework, it was hoped that it could support stability in the agribusiness sector. In line with this, this research aimed to identify the causal relationship between monetary policy and the agribusiness sector in Indonesia during the 1995–2023 period. Using vector autoregressive (VAR) methodology, this study analyzed the interaction between monetary policy variables (interest rates, exchange rates, and money supply) and GRDP in the agribusiness sector, which includes agriculture, livestock, forestry, and fisheries. The analysis results showed that the monetary policy implemented by Bank Indonesia had a positive impact on the agribusiness sector. By controlling price stability, increasing access to credit, and maintaining exchange rate stability, monetary policy contributed significantly to increasing productivity and welfare in the Indonesian agribusiness sector. These findings emphasized the importance of synergy between monetary policy and the development of the agribusiness sector in supporting national economic resilience and growth. The implications of this research highlighted the need for a monetary policy framework that is responsive to the needs of the agribusiness sector, as well as the importance of close coordination between monetary authorities and stakeholders in the agricultural sector. Thus, optimizing monetary policy could be a catalyst for sustainable agribusiness development, encouraging innovation, and increasing the competitiveness of this sector at the global level.

Keywords: Agribusiness, Monetary Policy, VAR (Vector Autoregressive), Indonesia

REGENERATION OF AGRICULTURAL HUMAN RESOURCES BASED ON DIGITAL HUMANITIES

Meki Herlon[1]*, Zulhamid Ridho[1] Kausar[1], Arifuddin[1], Imam Hidayat[1]

[1]Faculty of Agriculture, Universitas Riau, Pekanbaru, 28294, Indonesia

*E-mail: mekiherlon@lecturer.unri.ac.id

ABSTRACT

The role of the agricultural sector in national development can be seen from employment absorption. The younger generation represents the largest demographic in the workforce and serves as the transition from non-productive to productive-aged farmers. The challenges in youth regeneration in agriculture today primarily include the lack of interest among the younger generation in pursuing agricultural professions, the perception that non-agricultural fields are more economically promising than farming, the dominance of elderly farmers compared to young individuals interested in farming, and farming being seen more as a tradition rather than a profession. These challenges in agricultural regeneration are currently being experienced in Pekanbaru City, where the proportion of young farmers is relatively small (7.41%) compared to elderly farmers (92.59%). The purpose of this study is to analyze the characteristics, perceptions, and utilization of social media by the younger generation towards the agricultural sector in the application of Digital Humanities. The research employs a survey method, with sample collection conducted using simple random sampling. The total sample size in this study is 120 individuals, with 40 youths each from three categories: those not yet working in agriculture, those currently studying agriculture, and those already employed in agriculture. Data analysis is conducted using qualitative descriptive methods, employing Likert's Summated Rating Scale and Structural Equation Modeling Partial Least Squares (SEM PLS).

Keywords: Regeneration, Digital, Resource

BROILER CHICKEN AND EGG PRICE VOLATILITY: A COMPARATIVE ANALYSIS BEFORE AND DURING THE COVID-19 PANDEMIC IN INDONESIA

Priyono[1], Supardi Rusdiana[2]*, Umi Adiati[2], Maplani[2] and Chalid Talib[2]

[1]Research Center for Behavioral and Circular Economics, National Research and Innovation Agency, Jl Jend Gatot Subroto 10 Jakarta, Indonesia
[2]Research Center for Animal Husbandry, National Research and Innovation Agency, Cibinong Science Center, Jl Raya Jakarta-Bogor, Cibinong, Bogor 16915, Indonesia

*E-mail: supa039@brin.go.id

ABSTRACT

The COVID-19 pandemic has disrupted the poultry industry, particularly broiler chicken and egg markets. The volatility dynamics and price responses of the broiler chicken and egg market in Indonesia become important to examine before and during the COVID-19 pandemic. The research objective of this study is to compare the volatility of broiler chicken and egg prices and assess their responses to the pandemic. The study used daily price data from March 2018 to October 2021 sourced from the Indonesian Ministry of Agriculture. This study employs ARCH/GARCH models and independent sample t-tests to analyze the volatility dynamics and price responses of broiler chicken and egg markets in Indonesia before and during the COVID-19 pandemic. The results showed that there is a notable increase in volatility in broiler chicken prices during the pandemic, demonstrated by $\alpha + \lambda$ values of 1.011, in contrast to the relatively more stable behavior of egg prices, which demonstrated $\alpha + \lambda$ values of 0.963. Independent sample t-tests confirm significant differences in mean prices before and during the pandemic for both commodities broiler chicken (p-value < 0.05) and egg price (p-value < 0.05). The mean of broiler chicken prices experienced a decline, while the mean of egg prices showed an increase during the pandemic period. Stakeholders and policymakers can use these findings to formulate effective policies aimed at enhancing market stability and resilience to future external shocks.

Keywords: ARCH/GARCH Model, Broiler Chicken, Egg Price, COVID-19 Pandemic, Price Volatility

FARMER'S ENTREPRENEURIAL BEHAVIOR IN LONG PEPPER (Piper Retrofractum Vahl) CULTIVATION IN BLUTO DISTRICT, SUMENEP REGENCY

Fuad Hasan[1]*, Ihsannudin[2], Ifan Rizky Kurniyanto[1] and Resti Prastika Destiarni[1]

[1]Department of Agribusiness, Faculty of Agriculture, Trunojoyo University of Madura, Indonesia
[2]Department of Agricultural Extension, Faculty of Agriculture, University of Jember, Indonesia

*E-mail: fuadhasan@trunojoyo.ac.id

ABSTRACT

The cultivation of long pepper presents promising economic and agroclimatic potential. Sumenep Regency—characterized by its suitability for long pepper cultivation—remains underutilized due to limited intensive management by local farmers. This phenomenon hinges significantly on farmers' entrepreneurial behavior. This study seeks to assess the entrepreneurial behavior of long pepper farmers and identify key influencing factors. Primary data was gathered through questionnaires administered to a sample of 50 farmers. Descriptive statistics and multiple linear regression were employed for data analysis. The descriptive findings indicate that most farmers exhibit satisfactory entrepreneurial behavior across four defining indicators: future orientation, risk-taking propensity, task and results orientation, and innovation. Moreover, farmers demonstrate commendable entrepreneurial traits in terms of self-confidence and persistence. Regression analysis reveals that farmers' experience and membership in agricultural groups positively correlate with entrepreneurial behavior, whereas educational attainment shows no significant impact.

Keywords: Entrepreneurial Behavior, Entrepreneurship, Long Pepper

ANALYSIS OF E-COMMERCE ADOPTION INTENTIONS BY TRADITIONAL BEVERAGE MSMES IN BANTUL REGENCY BASED ON TECHNOLOGY ACCEPTANCE MODEL THEORY

Khairum Bannaati Ahmad[1]*, Kusnandar[1], Wiwit Rahayu[1]

[1]Agribusiness Study Program, Faculty of Agriculture, Universitas Sebelas Maret

*E-mail: khairum_ahmd@student.uns.ac.id

ABSTRACT

Trends in traditional beverage consumption are spreading among the public as covid-19 pandemic hits Indonesia in 2020. Meanwhile, people's behaviour towards digital technology, especially e-commerce, has changed. This situation encourages MSME holders, especially the traditional beverage sector, to adapt towards online shopping systems. The existence of e-commerce should provide efficiency in business, but its use by traditional beverage MSMEs was found less than optimal, causing some businesses stagnant. Referring to Technology Acceptance Model (TAM) theory, non-optimal use of a technology requires an adoption intention analysis. This study aims to determine the role of personal innovativeness, social influence, perceived ease of use, perceived usefulness, and attitude toward use on e-commerce adoption intention by traditional beverage MSMEs in Bantul regency. This research method is descriptive quantitative. The number of samples was 103 of traditional beverage MSMEs which were selected purposively. The analysis method used is SEM-PLS. The analyzed results show that e-commerce adoption intention is influenced by perceived usefulness and attitude to use, but not by perceived ease of use. Attitude to use is influenced by perceived usefulness and perceived ease of use. Perceived usefulness itself is influenced by perceived ease of use, personal innovativeness, and social influence. Last, the perceived ease of use factor is only influenced by personal innovativeness and is not influenced by social influence.

Keywords: E-Commerce, Traditional Beverages, Adoption Intention, TAM

EFFICIENCY OF DAIRY CATTLE BUSINESS IN PLAOSAN DISTRICT, MAGETAN REGENCY

S Emawati[1,2]*, S H Purnomo[1,2], E T Rahayu[1,2], A I Sari[1,2] and R Dewanti[1,2]

[1] Faculty of Animal Science, Universitas Sebelas Maret, Jl. Ir. Sutami No.36A, Kentingan, Surakarta, 57126, Indonesia
[2] Food, Nutrition and Public Health Research and Development Center, Universitas Sebelas Maret, Jl. Ir. Sutami No.36A, Kentingan, Surakarta, 57126, Indonesia

*E-mail: shantiemawati@staff.uns.ac.id

ABSTRACT

This study aims to analyze the demographic characteristics of dairy farmers and the efficiency of dairy cattle businesses in Plaosan District, Magetan Regency. The research design uses quantitative descriptive methods and research techniques use survey methods. The method for determining the location and respondents uses a purposive sampling method. Data were then collected using interviews, observation, documentation, and literature study. Primary data were derived from interviews with dairy farmers, while secondary data were obtained from related agencies. Data were analyzed using quantitative descriptive analysis and allocative efficiency analysis. Based on the research results, it shows that the average breeder is of productive age, the education level is low, namely junior high school, the farming experience is 9 years, the number of family members is 4 people, and the average number of dairy cattle ownership is 4 head. The allocative efficiency test showed that production factors on dairy cattle livestock have not reached optimal levels because the ki value is not equal to 1. The conclusions that farmers still need to be more efficient in using production factors.

Keywords: Efficiency, Dairy Cattle, Businesses, Demographic Characteristics

THE INFLUENCE OF MARKETING MIX 4P ON CONSUMER BUYING INTEREST IN SAYURBOX SURABAYA E-COMMERCE

Ovilia Eka Fernanda[1], Dian Islami Prasetyaningrum[1]*

[1]Department of Agricultural Socio-Economics, Universitas Brawijaya, Malang

*E-mail: dianislami@ub.ac.id

ABSTRACT

Information technology is developing and impacts human life, including business, especially e-commerce. Sayurbox is an e-commerce company that offers various vegetable and fruit products with a farm-to-table concept. The problem the Sayurbox company faces is the decreasing number of buyers in the Sayurbox Surabaya application. Problems mentioned in Sayurbox are due to the ineffective implementation of the 4P Marketing mix, which influences the consumers' interest in purchasing Sayurbox's products. This research aims to analyze the influence of the 4P marketing mix, which includes product, price, place, and promotion, on consumer buying interest. This research uses a quantitative approach with multiple linear regression analysis methods. Determining the sample in this study used a non-probability sampling technique, namely purposive sampling. The number of respondents was 100 samples. The research showed that the product and price variables significantly influence consumer buying interest. The promotion variable has an effect but is insignificant, while the place variable does not affect consumer buying interest. By understanding the influence between variables, it is hoped that the company can provide a better understanding of the factors that influence consumer buying interest in Sayurbox e-commerce and give input to improve product quality and pay attention to promotions, prices, and the place/distribution channel (place) on the platform.

Keywords: Marketing Mix 4P, Product, Price, Place, Promotion, Buying Interest

WHAT IS CONSUMER PREFERENCE FOR CHICKEN MEAT PRODUCT ATTRIBUTES IN JEMBER REGENCY? : A CONJOINT ANALYSIS APPROACH

Ahmad Zainuddin[1*], Illia Seldon Magfiroh[1], Intan Kartika Setyawati[1], Rena Yunita Rahman[1] and Luh Putu Suciati[1]

[1]Agribusiness Study Program, Faculty of Agriculture, University of Jember
Jalan Kalimantan 37 Kampus Tegal Boto, Jember

[*]E-mail: zainuddin91.faperta@unej.ac.id

ABSTRACT

The demand for chicken eggs in Jember Regency has continued to increase in the last few periods. This has an impact on consumer preferences in buying chicken egg products. Differences in consumer preferences in purchasing chicken egg products are highly dependent on the attributes of the product. The purpose of this study was to analyze rural consumer preferences for chicken egg product attributes in Jember Regency. This research was conducted in Jember Regency using a sample size of 120 respondents. This research will be conducted using the conjoin model to analyze consumer preferences for chicken eggs. The results showed that consumers preferred a purchase size of <1 kg, an intact and good egg condition, a clean condition and no dirt attached, a small egg size, and an egg price ranging from Rp. 20,000- Rp. 25,000 per kg. In addition, the most important attributes for consumers in buying chicken eggs are egg price (33.67%), egg size (30.49%), purchase size (25.98%), egg condition (5.96%), and cleanliness (3.90%).

Keywords: Consumer, Preference, Chicken Meet, Atributes, Conjoint Analysis

ECONOMIC EFFICIENCY IN THE UTILISATION OF CORN PRODUCTION FACTORS IN THE BONE BOLANGO REGENCY, GORONTALO

Supriyo Imran[1], Ria Indriani[1]*

[1]Department of Agribusiness Universitas Negeri Gorontalo

*E-mail: ria.indriani@ung.ac.id

ABSTRACT

Efficiency is a method used to evaluate the choice of production elements employed in corn growing activities in Bone Bolango Regency, with the aim of achieving maximum production. Maximum profits will be achieved if all production factors, such as land, seeds, fertilizers, and medicines, have been allocated for optimal and efficient use, including technical, price, and economic efficiency. The research aimed to assess the technical, pricing, and economic efficiency of production factors in corn cultivation in Bone Bolango Regency, Gorontalo. The research utilized a survey methodology, which involved conducting interviews with a sample of 100 corn farmers from various corn-producing sub-districts in the Bone Bolango Regency. The research lasted for 4 months, from January to April 2024. The efficiency of corn production components was examined using multiple regression analysis with the Cobb Douglas Production Function model technique. The results of the research showed inefficiency among corn farmers in Bone Bolango Regency in using production factors such as land area, seeds, fertilizers, and medicines, both technically, pricing and economically. Only land factors influenced the increase in corn production in Bone Bolango Regency. Hence, it was imperative to minimize the quantity of production inputs such as land area, fertilizers, and medicine in order to achieve optimal efficiency and maximize corn yield.

Keywords: Efficiency, Production, Technical, Price, Economical

LOCAL PERCEPTION ON DEVELOPING ECOTOURISM OF KINTAMANI ARABICA COFFEE IN SUBAKABIAN TRI KARYA NADI, CATUR VILLAGE, BANGLI REGENCY-BALI

I Made Sarjana[1]*, Putu Udayani Wijayanti[1], and Ni Luh Prima Kemala Dewi[1]

[1]Bachelor of Agribusiness Udayana University

*E-mail: madesarjana@unud.ac.id

ABSTRACT

Subakabian Tri Karya Nadi (TKN) is one of many subakabians which was established in 1978/1979 by Bali Government. Subakabian is dryland famers organization It was developed as a social engineering on Proyek Repitalisasi dan Pengembangan Tanaman Ekspor (PRPTE) or Revitalisation and Development Export Commodities Project of arabika coffee. Subakabian TKN has play important role on supporting farmers in Kintamani Sub-District, Bangli Regency to adopt innovation related arabica coffee. As a fact, arabika coffee has been utilized as primary source of income by farmers in Subakabian TKN. In the past, money which was collected from arabica coffee marketing employed as annual saving. Farmers will sell their arabica coffee products if they need much money to allocate as big cost on developing house, educational fee for the children or customery ceremony. Up to now good agricultural pratices of Kintamani Arabica Coffee (KAC) in Subakabian TKN is still exist so farmers can get a bonus to develop an ecotourism destination. This article examine local perception in order to optimize opportunity on integrated GAP of arabica coffee with tourism industry. The research use qualitative research method and the data were generated by observation, deep interview and literature review. The research figure out that farmers have high motivation to involve on developing ecotourism based GAP of Kintamani Arabica Coffee. They have positive perception on transforming Subakabian TKN as a tourism stakeholder. Farmers already manage the landscape of arabica coffee plantation to provide good quality of amenity for tourists. Unfortunately, farmers feel them selves having low bargaining position on setting tourism packaging price. As a recommendation, it needs to increase tourism stakeholder awareness on supporting farmers develop ecotourism destination.

Keywords: Local Perception, Ecotourism, Kintamani Coffee Arabica

ANALYSIS OF CONSUMER PREFERENCES TOWARD MULU BEBE BANANA IN NORTH MALUKU

Mardiyani Sidayat[1]* and Firlawanti Baguna[2]

[1]Department of Agribusiness, The Faculty of Agriculture, Khairun University, Indonesia
[2]Department of Forestry, The Faculty of Agriculture, Khairun University, Indonesia.

*E-mail: dhiany_220973@yahoo.com

ABSTRACT

Mulu bebe (Musa acuminate) banana is one of the local food crops in North Maluku. This crop mostly found in The West Halmahera areas as one of production central in here. Identifying customer preferences is a crucial effort to support the sustainable local commodity development in the future. It is important to identifying the factors such as cultural, quality, price and taste, and how those factors can influence the customer preferences. This study uses descriptive-qualitative and quantitative that aims to analyze consumer preferences toward mulu bebe banana. The study taken place in the central market of Ternate and Sofifi, where 80 selected respondents are taken accidentally in the designated locations. The data analyses used the help of SPSS version 26 data application. The result showed that the factors of culture (X1), quality of product (X2), Price (X3) and taste (X4) simultaneously have a positive effect on consumer preferences toward mulu bebe banana

Keywords: Consumer Preferences, Mulu Bebe, Banana

DEVELOPMENT STRATEGY OF OYSTER MUSHROOM AGROINDUSTRY IN JEMBER REGENCY

Danu Indra Wardhana[1]*, Ara Nugrahayu Nalawati[1], Andika Putra Setiawan[1] Muchamad Imam Asrori[1], Afan Bagus Mananda[1] and Rizki Rismawati[1]

[1]Department of Agroindustrial Technology, University of Muhammadiyah Jember, Jl. Karimata No.49 Jember 68121, Indonesia

*E-mail: danuindra@unmuhjember.ac.id

ABSTRACT

The oyster mushroom agroindustry in Jember Regency has not developed as expected despite the region being one of the largest oyster mushroom producers in East Java. The development is hampered by various challenges which need to be identified by appropriate strategies. Several methods are used for this research including Exponential Comparison Method (MPE), Interpretive Structural Modeling (ISM) and Analytical Hierarchy Process (AHP). The research identifies powdered mushroom broth as a viable product and will be promising for further development. The key development elements include the need for skilled human resources, as well as constraints such as the lack of a clearly structured and applicable agro-industry design, insufficient stakeholder involvement, and inadequate business permits. The key players in the development are farmers/growers and investors whose goal is to penetrate national and international markets and increase scientific publications and research on oyster mushroom. The AHP methodology shows that focusing on improving product quality (0.520) is critical to business success, while improving human resources (0.314) is an important alternative strategy. This comprehensive analysis highlights the need to address certain constraints and leverage key players to achieve development goals, with the ultimate goal to build a robust and competitive oyster mushroom agroindustry of Jember Regency.

Keywords: Ahp, Development Startegy, Ism, Mpe, Oyster Mushroom

THE INFLUENCE OF SOCIO-ECONOMIC FACTORS ON THE FOOD CONSUMPTION DIVERSIFICATION OF FISHING HOUSEHOLDS IN THE BONTANG CITY EAST KALIMANTAN

Aghitsni Rahmatunisa[1], Darsono[1], Wiwit Rahayu[1]*

[1]Agribusiness Department, Faculty of Agriculture, Universitas Sebelas Maret, Surakarta, Indonesia

*E-mail: wiwitrahayu@staff.uns.ac.id

ABSTRACT

The livelihoods of coastal communities in Bontang City are based on catching and cultivating fish. Limited fishing for small-scale fishing communities in Bontang City has the potential to affect income and food consumption. This research aims to analyze energy and protein consumption, food consumption diversification among fishing households in Bontang City and the influencing factors. A sample of 50 fishing households was taken using the purposive sampling method. Primary data was taken through interviews, documentation, and food recalls. The data analysis methods used are analysis of energy and protein consumption levels, analysis of desirable dietary pattern scores and multiple linear regression. The results of the analysis show that the average energy consumption of fishing household members is 1,718 kcal/capita/day with an energy consumption level of 77.59% (moderate deficit). The average protein consumption of fishing household members is 47 grams/capita/day with a consumption level of 77.65% (moderate deficit). The food consumption diversification of fishing households is categorized as lacking with an average desirable dietary pattern scores of 55.11. Income and food consumption expenditures have a positive effect on energy consumption levels, while the number of household members and education have a negative effect. Income has a positive effect on the level of protein consumption, while the number of household members and the price of rice have a negative effect. The number of household members and education have a positive effect on food consumption diversification, while the price of rice has a negative effect.

Keywords: Diversification Consumption, Energy, Protein, Fishing Households

THE EFFECT OF SELF-EFFICACY, MOTIVATION, AND BUSINESS KNOWLEDGE ON MILENIAL FARMERS BUSINESS SUCCESS

Wendy Yoga Artananda[1], Kusnandar[1], Indah Nurhidayati[1], and Isti Khomah[1]*

[1]Department of Agribusiness, Faculty of Agriculture, Universitas Sebelas Maret, Indonesia

*E-mail: aiyanakanza@staff.uns.ac.id

ABSTRACT

The agricultural sector in Indonesia has great potential in contributing to economic growth and development, both in terms of income and employment. Although the number of workers fluctuates every year, the agricultural sector in Central Java Province is still considered one of the sectors with a significant contribution to GRDP. This study aims to determine the effect of self-efficacy, motivation, and business knowledge on business success, mediated by commitment, in millennial farmers in Central Java Province. This research uses a descriptive method with a quantitative approach as the basic method. Data were obtained through in-depth interviews and observations using a questionnaire. The research location was determined purposively, namely in Central Java Province. The number of respondents taken amounted to 104 millennial farmers selected through purposive sampling. The data analysis method used is SEM (Structural Equation Modeling) with the PLS (Partial Least Square) approach using SmartPLS software version 3. Based on the results of the study, it is concluded that the variables of self-efficacy, motivation, business knowledge, and commitment have a direct positive and significant effect on business success. Mediation results show that the relationship between self-efficacy, motivation, and business knowledge, mediated by commitment, to business success is partial mediation.

Keywords: Business Knowledge, Business Success, Commitment, Motivation, Self-Efficacy

SMART BUSINESS INNOVATIONS IN SUSTAINABLE AGRICULTURE TO ENSURE FOOD SECURITY

Wahyu Lis Setyaningsih[1]*, Budi Setiawan[1], Agustina Shinta[1]

[1]Departement of Agricultural Social Economics, Faculty of Agriculture, Brawijaya University, Indonesia

*E-mail: emailcorrespondingauthor@gmail.com

ABSTRACT

This study examines the role of technology innovation adaptation and business strategy in promoting agricultural sustainability and community food security in the context of smart business practices in sustainable agriculture in East Java, Indonesia. Utilizing Structural Equation Modeling-Partial Least Squares (SEM-PLS), data was gathered from 100 farmers and agribusinesses in East Java, known for their diverse agricultural products and geographic conditions. The research reveals that TIA significantly impacts CFS, highlighting its direct contribution to improving local food security through technological advancements and farmers' adaptive capabilities. TIA's influence on ASY suggests a less robust effect on sustainable agricultural practices compared to its impact on food security, necessitating supplementary measures like environmental policies and farmer education. Business Strategy (BSY) significantly enhances CFS, underscoring the critical role of strategic planning and execution in ensuring food security. Effective business practices in the agricultural sector can bolster food availability, accessibility, and stability, thereby contributing to community well-being. Similarly, the relationship between ASY and CFS is highly significant, emphasizing the importance of sustainable agricultural practices. This research contributes to the evolving discourse on smart business innovations in sustainable agriculture in East Java, offering practical insights for policymakers, practitioners, and stakeholders in enhancing food security through sustainable agricultural practices and community engagement.

Keywords: Technology Innovation, Business Strategy, Agricultural Sustainability, Community Food Security, SEM-PLS

HOW TO MEASURE THE SUCCESS OF A BROILER CHICKEN BUSINESS?

Amam Amam[1]*, Supardi Rusdiana[2], and Amir Sofwan Alwafa[1]

[1]Department of Animal Husbandry, Faculty of Agriculture, Universitas Jember, Indonesia
[2]National Research and Innovation Agency (BRIN) of the Republic of Indonesia, Indonesia

*E-mail: amam.faperta@unej.ac.id

ABSTRACT

Broiler chicken cultivation is an activity to produce broiler chicken livestock for consumers. To determine the success of a broiler chicken farming business, a measurement method that is comprehensive and acceptable to all parties is needed, so this research aims to measure the success of the broiler chicken farming business. This research is observational research using quantitative descriptive methods. The interview technique was carried out in depth and comprehensively to describe data, facts and realities in the small-scale broiler chicken farming business, namely with a broiler chicken population of 7,000. The research results showed that the total cost of production facilities was: a) IDR 223,287,900, consisting of Daily Old Chicken (DOC) costs of 5.7%, feed costs of 81.59%, and drugs, vitamins and chemicals (OVK) cost of 1.16%; b) total chicken sales of IDR 265,878,900 consisting of a total harvest of 6,567 broiler chickens (heads) and a total of 14,312 chickens (kg); c) broiler chicken cultivation performance (performance index) of 299.42, consisting of an average harvest age of 41.50 days, Feed Conversion Ratio (FCR) of 1.65, and depletion of 433 animals (6.19%). The conclusion of this research was that the farmer's income was 42,591,854 with a B/C ratio of 0.19.

Keywords: Broiler, Chicken, Performance Index, Production Evaluation Of Broiler, And Production Factors

PRICE DISPERSIONS OF BROWN RICE RECEIVED BY CONSUMERS BASED ON LOCATION OF SELLER IN INDONESIA THROUGH E-COMMERCE

Octaviana Helbawanti[1]*, Hendar Nuryaman[1], Suyudi[1], Dedi Djuliansah[1], Tenten Tedjaningsih[1], Riantin Hikmah Widi[1]

[1]Faculty of Agriculture, University of Siliwangi

*E-mail: octaviana@unsil.ac.id

ABSTRACT

Brown rice has many excellences compared to white rice, thus sold in e-commerce at a higher price than white rice. Consumers who buy the product have known brown rice offered at various price levels. Consumers can quickly choose products through their preferences by reading descriptions that can be rapidly seen on the mobile screen. Price variations on a particular product type can indicate production and handling costs. Research on brown rice price behavior had the objective to investigate and analyze the dispersions of prices in Java and outside Java, also online sales attributes. The methods used were a two-sample unpaired t-test and Moderated Regression Analysis (MRA) using numbers of products as moderated variables. The analysis results revealed that sales were influenced by store performance, which could be examined from ratings, number of stars, availability of photos and videos, and seller location. The number of products on display did not affect brown rice purchases because consumers who bought brown rice were willing to pay more for a healthier life. The selling price of brown rice was distinct and varied due to differences in location, Java, and outside Java, although markets tend to be perfect. There were price dispersion on the same brand and quantity on e-commerce. The profit expectation of the seller also determined the price variation. Competition with other sellers would constrain price increases if the product did not have special specifications that were very different from similar products in the market.

Keywords: Price Dispersion, Brown Rice, E-Commerce

IMPLEMENTATION INNOVATION AND SUPPORTING FACTORS HORTICULTURE AGRIBUSINESS

Idawati[1]*, Reni Suryanti[2]

[1]Agribusiness Study Program, Faculty of Agriculture, Andi Djemma University, Palopo, Indonesia
[2] Bogor Agricultural Development Polytechnic, Indonesia

*E-mail: idawati.unanda@gmail.com

ABSTRACT

The concept of rural agricultural industrialization is a development concept that reflects the unity of the agricultural industry which is integrated with output in the form of products that have large economic added value. The research objectives were (1) to describe horticultural agribusiness activities in the downstream horticultural agribusiness sub-sector that had been carried out by farmers (2) to analyze the level of application of rural horticultural agricultural industrialization innovations (3) to analyze the influence of downstream sub-sector activities and the application of rural agricultural industrialization. Research methods include quantitative and qualitative analysis. Sampling was determined by means of a census of 30 members of the Bakti Mandiri group who run a horticultural agribusiness. Data collection was carried out by means of purposive sampling through interviews using a questionnaire. Data collection was carried out by interviews and questionnaires. Data analysis used descriptive qualitative in the form of percentages and multiple regression to describe the activities of the downstream sub-sector, the level of IPP implementation and the factors that influence it. The results of the research show that (1) Marketing is arranged by groups with direct sales to collectors, then resold to retailers in the central market. (2) The characteristics of innovation in the application of rural agricultural industrialization with the use of place, time and ownership of the marketing function have gone well, while the change in form (processing) has not been carried out. (3) Extension support contributes to the implementation of rural agricultural industrialization. The application of rural agricultural industrialization in optimal conditions, especially self-help through the heads of farmer groups.

Keywords: Agribusiness, Counseling, Horticultura, Industrialization, Rural

Sustainability of Animal Husbandry and Feed Production

EVALUATION OF REPRODUCTIVE PERFORMANCE AND IMPLEMENTATION OF GOOD DAIRY FARMING PRACTICE IN PURING SARI DAIRY CATTLE GROUP

Himmatul Khasanah[1,2]*, Daffa Taufiqulhakim[1], and Desy Cahya Widianingrum[1,2], Nur Widodo[1,2], Gayuh Syaikhullah[3]

[1]Anima Husbandry Study Program, Faculty of Agriculture, University of Jember
[2]Animal Breeding and Production Reseach group, Faculty of Agriculture University of Jember
[3]Animal Science Department, Politeknik Negeri Jember, Jember, Indonesia

*E-mail: himma@unej.ac.id

ABSTRACT

Dairy cattle are the main livestock commodity contributing to national milk availability. However, in the production process, the challenges and constraints faced by farmers are quite large and can result in losses. The implementation of reproductive management and good maintenance management practices have not been applied optimally. The purpose of this study was to analyze the reproductive performance of cows based on their age and to analyze the implementation of Good Diary Farming Practices (GDFP) by the Puring Sari cattle group. This study used observational and interview methods by collecting primary and secondary data. The samples used were 50 Peranakan Frisian Holstein (PFH) cows to analyze the reproductive performance and 30 farmers to analyze the implementation of GDFP. The results showed the average value of S/C 4.6, DO 175 and CI 456.4 while the application of GDFP received a score of 3.04 out of 4.00 points with details of the assessment criteria namely livestock health 3.3, cleanliness in milking 4, feed nutrition 2.6, livestock welfare 3.6 and environmental conditions of maintenance 1.7. It is concluded that the reproductive performance of PFH cattle in the Puring Sari livestock group is low, besides that the reproductive appearance in the Puring Sari livestock group also has a strong relationship with the age of the livestock and for the application of GDFP in the Puring Sari livestock group gets a total score of 3.04 with a good score, but the criteria for maintenance environmental conditions get a poor score and require improvement.

Keywords: Age, Dairy Cows, GDFP, Management, Reproduction

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REGIONAL VARIATION IN ANTINUTRIENT CONTENT OF GAMBIER (*UNCARIA GAMBIR*): IMPLICATIONS FOR RUMINANT FEED EFFICIENCY AND METHANE REDUCTION

Roni Pazla[1]*, Asmuddin Natsir[2], Rahmat Hidayat[3], Nurzainah Ginting[4], Mardiati Zain[1], Antonius[5], Zaitul Ikhlas[6], Bella Veliana Utami[6], and Laras Sukma Sucitra[6]

[1]Department of Animal Nutrition and Feed Technology, Faculty of Animal Husbandry, Universitas Andalas, Padang, West Sumatra, Indonesia
[2]Animal Nutrition Department, Faculty of Animal Science, Universitas Hasanuddin, Makassar, Indonesia
[3]Faculty of Animal Husbandry, Universitas Padjadjaran, Indonesia
[4]Department Animal Sciences, Faculty of Agriculture, Universitas Sumatera Utara, Jl. Prof. DR. A. Sofyan No 3, Medan 20155, North Sumatera, Indonesia
[5]Research Centre for Animal Husbandry, National Research and Innovation Agency, Cibinong Sciences Center
, Jl. Raya Jakarta–Bogor, Cibinong 16915, West Java,
Indonesia
[6]Graduate Program, Faculty of Animal Science, Universitas Andalas, Padang, West Sumatra, Indonesia

*E-mail: ronipazla@ansci.unand.ac.id

ABSTRACT

Given the role of stanniferous gambier as a possible defaunation agent in ruminants, this study aimed to quantify the antinutrients of gels produced from root extracts sourced among different regions and classified using libraries generated by their profile. One of the extracts derived from gambier plant leaves, and twigs are gambier, which contains high levels of catechins and tannins known as anti-methanogenic compounds that can suppress total gas production in rumen degradable feed protein (RDP) with little to no effect on degradation or fermentation fluxes. A completely randomized design was adopted for an experiment with eight treatments and three replicates, including gambier from Sutera (A), Langgai (B), Pangkalan (C), Simpang Kapuk (D) Pakpak (E) Maek (F) Tolang (G) and Talang Maur (H). The tannin, catechin, and saponin contents were measured as critical variables. Statistical comparison among different groups was performed by one-way analysis of variance, followed by the DMRT test for posthoc comparisons; for the tannins and catechins, plant defense chemicals, saponin levels showed significant differences ($P<0.05$) between treatments according to DMRT analysis. Gambier from Pakpak was significantly higher in terms of catechin (71.37%), followed by tannin contents (71.51%) compared to Maek's gambier, and saponins content showed the highest level for them (1.37%). These findings reveal Gambier's antinutrient distribution to be varied across regions, leading Pakpak and Maek to climb the top source. Together, this study reinforces the potential of gambier as a natural ruminant feed additive to improve nutrition and reduce environmental burden, providing insights for sustainable animal husbandry.

Keywords: Gambir, Tannins, Catechins, Saponins.

CORN STOVER AS AN ALTERNATIVE FIBER FEED TO SUBSTITUTE ELEPHANT GRASS IN RUMINANTS BY USING IN VITRO TECHNIQUES

Susi Dwi Widyawati[1]*, Adi Ratriyanto[1], Wara Pratitis Sabar Suprayogi[1], Sudibya[1], Moya Trishna Pramasti[2], Alfina Destianawati[2], Faisal Ubaydillah Gilang Ramadhan[2]

[1]Department of Animal Science, Faculty of Animal Husbandry, Sebelas Maret University, Indonesia
[2]Student of Animal Science Department, Faculty of Animal Husbandry, Sebelas Maret University, Indonesia

*E-mail: susidwi@staff.uns.ac.id

ABSTRACT

Corn stover is an agricultural waste that has not been optimized as animal feed. The continuous availability of corn stover can be an alternative for smallholder farmers who still use straw as agricultural waste for fiber sources. This study aims to examine the effect of substituting elephant grass with corn stover in rations on the value of dry matter digestibility (DMD), digestibility of organic matter (OMD) and fermentability of rations in vitro tilley and terry. This study was conducted using a completely randomized design with 3 treatments: R0 = 60% elephant grass and 40% concentrate; R1 = 10% corn stover, 50% elephant grass, and 40% concentrate; R2 = 20% corn stover, 40% elephant grass, and 40% concentrate;. The results showed that the digestibility of dry matter (DMD) and digestibility of organic matter (OMD) at the fermentative stage can substitute elephant grass up to 33.33% or 20% in the ration, while at the fermentative and enzymatic stages can increase significantly ($P < 0.05$). Substitution of 10% and 20% in the ration increased the digestibility value of DMD and OMD compared to the control ration (R0). In terms of fermentability in the rumen, the substitution of elephant grass with corn stover did not have a significant effect. The conclusion of this study is that corn stover can be used up to 20% level in the ration.

Keywords: Corn Stover, Elephant Grass, In Vitro Techniues, Digestibility, Fermentability

SUBSTITUTION OF BREAD WASTE IN RATIONS ON DIGESTIBILITY OF ORGANIC MATTER IN ETTAWA CROSSBREED GOATS

Sudiyono[1], Hanifa, A[1]*., Widyawati, S.D[1]., and N. Aga[2]

[1]Department of Animal Science, Faculty of Animal Husbandry, Sebelas Maret University, Indonesia
[2]Graduate School of Animal Science Department, Faculty of Animal Husbandry, Sebelas Maret University, Indonesia

*E-mail : aqnihanifa@staff.uns.ac.id

ABSTRACT

This research aims to examine the effect of bread waste substitution in Ettawa Crossbreed goats rations on the consumption and digestibility of Organic Matter (OM) and Crude Protein (CP). This study used 15 Ettawa Crossbreed goats of second lactation. The research design used was a completely randomized design (CRD) unidirectional pattern with three treatments, each treatment consisting of five replicates. The ration treatment given was forage ration and concentrate with a composition of 20:80 with ration treatment, namely P1 = Silages 20% + Concentrates 64% + 16% bread waste; P2 = Silages 20% + Concentrates 56% + bread waste 24%; P3 = Silages 20% + 48% concentrates + 32% bread waste. The variables observed in this study included the consumption and digestibility of OM and CP. The study showed that the use of bread waste had no significant effect (P>0.05) on the consumption and digestibility of Organic Matter (OM) and Crude Protein (CP). The conclusion that can be drawn from this study is that the substitution of bread waste in concentrates up to 32% level in rations in terms of OM and CP consumption, also OM and CP digestibility does not interfere with the digestive process so that it can replace concentrates in rations.

Keywords: Ettawa Crossbreed Goats, Consumption, Digestibility, Bread Waste

THE EFFECT OF SUBSTITUTION ELEPHANT GRASS WITH AMMONIATED CORN TUMPI IN RATIONS ON GAS PRODUCTION IN VITRO GAS TEST

Hanifa, A.[1]*, Handayanta, E.[1], Hadi, R.F.[1], Widyawati, S.D[1], and D. Kurniawan[2]

[1]Department of Animal Science, Faculty of Animal Husbandry, Sebelas Maret University, Indonesia
[2]Student of Animal Science Department, Faculty of Animal Husbandry, Sebelas Maret University, Indonesia

*E-mail: aqnihanifa@staff.uns.ac.id

ABSTRACT

This study aims to determine the effect of substitution elephant grass with ammoniated corn tumpi on the gas production of ruminants. The materials used were ruminant rations and rumen fluid. The research design used a complete randomized design (CRD) one way with five treatments and four replications. The treatments on the rations given were P0 = elephant grass 60% + concentrate 40%, P1 = elephant gras 50% + concentrate 40% + corn tumpi 10%, P2 = elephant grass 40% + concentrate 40% + corn tumpi 20%, P3 = elephant grass 50% + concentrate 40% + ammoniated corn tumpi 10%, P4 = elephant grass 40% + concentrate 40% + ammoniated corn tumpi 20%. Data analysis used analysis of variance (ANOVA). The results showed that the substitution of elephant grass with ammoniated corn tumpi had no significant effect (P>0.05) on total gas production, fraction a, fraction b, and c rate produced. The conclusion that can be drawn in this study is that corn tumpi has to replace elephant grass up to the level of 20% in rations as ruminant feed when viewed from total gas production, fraction a, fraction b and c rate produced.

Keywords: Corn Tumpi, Ammoniated, Fermentation, *In Vitro Gas Test*, Gas Production

EFFECTIVENESS OF ADDING MOLASSES AND GAMBIER LEAF EXTRACT ON THE QUALITY OF INDIGOFERA ZOLLINGERIANA SILAGE

Antonius[1]*, Roni Pazla[2], Simon Petrus Ginting[1]

[1]Research Centre for Animal Husbandry, National Research, and Innovation Agency, Cibinong Sciences Center, Jl. Raya Jakarta–Bogor, Cibinong 16915, West Java, Indonesia
[2]Department of Animal Nutrition and Feed Technology, Faculty of Animal Husbandry, Universitas Andalas, Padang, West Sumatra, Indonesia

*E-mail: antoniuschaniago83@gmail.com

ABSTRACT

Indigofera zollingeriana is a superior livestock feed with high nutrient content and abundant biomass. Seasonal variations in Indonesia typically affect its production levels. Silage technology can be employed to prevent wastage of forage during abundant harvest seasons and ensure sufficient forage availability during lean periods in summer. High nutrient content in the forage, particularly protein, tends to break down during the silage process, affecting silage quality adversely. This study aimed to evaluate the effectiveness of adding molasses and gambier leaf extract as sources of phytochemical compounds on the quality of *Indigofera zollingeriana* silage and rumen fermentation in vitro. The study was designed using a completely randomized design with five treatments and five replications. Treatments included T1: indigofera leaves without additives, T2: indigofera leaves + 2% molasses, T3: T2 + 1% gambier leaf extract, T4: T2 + 2% gambier leaf extract, T5: T2 + 4% gambier leaf extract. Results indicated that adding molasses and gambier leaf extract positively influenced silage quality, characterized by a pleasant odor, absence of fungus, firm texture, and green color. On the other hand, silage without additives has a foul odor, wet texture, and fungus growth, posing risks for livestock. The dry matter content of the silage increased with higher amounts of gambier leaf extract additive. The best ammonia content from in vitro fermentation was observed in silage treated with 2% gambier leaf extract. In conclusion, molasses and gambier leaf extract additives enhance the quality of *Indigofera zollingeriana* silage, with the optimal addition being 2%.

Keywords: Silage Quality, Molasses Additive, Gambier Leaf Extract

LOBSTER TRADE BY INDONESIA: TRENDS AND COMPARATIVE ADVANTAGE

Amanatuz zuhriyah[1]*, Slamet Widodo[1], and Haryo Triajie[2]

[1]Agribusiness Department, University of Trunojoyo Madura
[2]MSP Department, University of Trunojoyo Madura

*E-mail: amanatuz@trunojoyo.ac.id

ABSTRACT

The aims of this research are to analyze trends and competitiveness of Indonesian lobster exports with the main destination country China. Research data for the 2019-2023 period was analyzed using trend analysis and revealed comparative advantages (RCA). The development of Indonesia's non-oil and gas exports over the last 5 years has shown a positive trend, as has the trend of Indonesian lobster exports to China. The results of the RCA analysis show that Indonesia has a comparative advantage compared to Vietnam in lobster exports to China.

Keywords: Lobster, Comparative Advantage, RCA

ANDROGRAPHIS PANICULATA ETHANOLIC EXTRACT AFFECTS THE SPLEEN'S HISTOPATHOLOGY OF SALMONELLA-INFECTED MICE

Purnaning Dhian Isnaeni[1*], Fuji Astuty Auza[2], Astriana Napirah[2], Putu Nara Kusuma Prasanjaya[2], Asma Bio Kimestri[2], Arby'in Pratiwi[2], Indah Amalia Amri[3]

[1]Animal Husbandry Study Programme, Faculty of Agriculture, University of Jember, Jember, Indonesia
[2]Faculty of Animal Husbandry, Halu Oleo University, Kendari, Indonesia
[3]Laboratory of Microbiology and Immunology, Faculty of Veterinary Medicine, Universitas Brawijaya, Malang, Indonesia

*E-mail: purnaningdhian@unej.ac.id

ABSTRACT

Andrographis paniculata, AP, is one of the herbs that are widely utilised as an alternative medicine for its active ingredients, especially andrographolide, which acts as an anti-inflammatory, antibiotic, and immunomodulator. Andrographolide's use as an immunomodulator in many animal models has been recorded, but the effect on the spleen of mice infected by bacteria, particularly Salmonella sp. has yet to be done so far. Forty mice were grouped into five different treatments in a completely randomised design: control negative (uninfected, untreated mice), control positive (infected, untreated mice), APC1 (infected, 200mg/kg BW AP), APC2 (infected, 300mg/kg BW AP), and APC3 (infected, 400mg/kg AP). The collected data was analysed to determine the effect of AP extract on mice's spleen. The results showed that AP extract improves the tissue damage of the spleen in Salmonella-infected mice. APC3 treatment proved to be effective in improving the damaged tissue to be on par with the control negative treatment.

Keywords: *Andrographis Paniculata*, Immunomodulator, Spleen, Infection

THE EFFECT OF DRAGON FRUIT PEEL AS AN ADDITIVE ON HEAT STRESS IN BROILER CHICKENS

Desy Cahya Widianingrum[1], Roni Yulianto[1], Nur Widodo[1], Alam Darmawan[1], Berlian Yusuf Ghani[1] and Himmatul Khasanah[1*]

[1]Department of Animal Science, University of Jember, Jember, Indonesia

*E-mail: himma@unej.ac.id

ABSTRACT

This study aimed to analyze the effect of dragon fruit peel as an additive for broiler chicken productivity raised under heat stress conditions. A total of 200 chicks (707 strains, Charoen Pokphand, Indonesia) were designed using a completely randomized design. This research was divided into four treatments with five replications, each consisting of 10 chickens/ replication. The treatments were P1 (normal temperature, no additives), P2 (normal temperature + 2% dragon fruit peel), P3 (heat stress, no additives), and P4 (heat stress + 2% dragon fruit peel). The chicken was raised for 35 days in Trebungan Village, Bondowoso Regency. Data observed included average daily gain (ADG), body weight gain (BWG), feed intake (FI), feed conversion ratio (FCR), as well dry and organic matter digestibility. Dry matter digestibility (DMD) was analyzed at the Animal Husbandry Laboratory, University of Jember. Organic matter digestibility (OMD) was tested at the Food Analysis Laboratory, State Polytechnic of Jember. The data obtained were analyzed using the Kruskal Wallis test and post hoc Dunn test if there was a significant difference ($P<0.05$). This research showed that in the majority, dragon fruit peel additives positively affected chickens during the starter phase, such as on ADG, BWG, DMD, and DMO, but had no effect in the finisher phase. Feed intake and FCR data were not significant among treatments. This research concluded that higher doses of dragon fruit peel as additives may be required to execute heat stress in finisher broiler chicken.

Keywords: Daily Body Weight, Feed Conversion Ratio, Feed Nutrient Digestibility, Broiler Feed Intake, Natural Additive

THE ROLE OF WOMEN MILK PROCESSORS IN KAMPUNG SUSU LAWU IN IMPROVING FAMILY INCOME

Ayu Intan Sari[1*], Sutrisno Hadi Purnomo[1], Endang Tri Rahayu[1], Shanti Emawati[1], Ratih Dewanti[1]

[1]Departemen of Animal Science, Faculty of Animal Husbandry, Universitas Sebelas Maret, Surakarta

*E-mail: ayuintan@staff.uns.ac.id

ABSTRACT

This research aims to analyze the reasons why women decide to work as milk processors, analyze the contribution of women milk processors to family income, analyze characteristic factors that influence motivation to become milk processors. The research was conducted in Kampung Susu Lawu (KSL), Sarangan Village, Magetan Regency, involving 70 female milk processing respondents who were selected using the census method. The data analysis method used is descriptive quantitative analysis, income analysis, business contribution analysis and multiple linear regression analysis. The research results showed that 42% of respondents stated that supporting family income was the main reason why women became milk processors. The average income of respondents from milk processing is Rp. 420,000 per month, with a contribution of income from milk processing work of 12% to family income. The average income of respondents from milk processing is Rp. 420,000/month, with a contribution of income from milk processing work of 12% to family income. The results of multiple linear regression analysis with the equation model Y= 2.003 + 0.162X1 + 0.032X2 - 0.034X3 + 0.187X4 + 0.0165X5 + e, show that age and income factors influence motivation to become a milk processor. The conclusion of this research is that women processing milk in Kampung Susu Lawu have a role in improving family income.

Keywords: Role, Milk Processors, Women, Family Income

EFFECT OF PELLETS BASED ON GOLD SNAIL FLOUR AND ADDITION OF TRYPTOPHAN ON GROWTH AND REDUCTION OF CANIBALISM IN FRESHWATER LOBSTER

Wachju Subchan[1*], Gilang Ferdiansyah[2], Abdu Rohman[2]

[1]Center for Development of Advanced Science and Technology, University of Jember, Jl. Kalimantan 37, Jember. 68121, Indonesia.
[2]Biology Education Department, Faculty of Education, University of Jember, Jl. Kalimantan 37, Jember, 68121, Indonesia.

*E-mail: wachju.fkip@unej.ac.id

ABSTRACT

One of the commodities that the market demands for consumption and is set at a premium price is freshwater lobster. Alternative feeds are required to lower feed costs because feed accounts for between 60-70% of production expenses. The golden snail's low cost and high protein content around 54% make it a promising element for freshwater lobster feed. Besides the food constraints, freshwater lobster cultivation often faces the problem of cannibalism. The study purpose to determine the effect of pellet made from golden snail flour and the addition of tryptophan on the growth and decrease in cannibalism of freshwater lobster. This study used a completely randomized design with 4 treatments and 3 replications. The design of this research is: K1 is fish meal without tryptophan, K2 is a combination of fish meal with 1.6% tryptophan, P1 is a combination of golden snail flour with 1.6% tryptophan, and P2 is a combination of golden snail flour with 2.25% tryptophan. The results of this research were that treatment with pellets made from golden snail flour had the best growth and the addition of a dose of 1.6% tryptophan was able to reduce cannibalism significantly. The conclusion of this research is that golden snail flour can be an alternative to commercial pellets with a cheaper price and high enough protein, and the addition of 1.6% tryptophan is the best dose to reduce cannibalism.

Keywords: *Cherax quadricarinatus*, Cannibalism, Golden snail flour, Growth, Tryptophan