

Jurnal Teknik Pertanian (J-TEP) is a scientific journal devoted to publish results of research, development, studies or ideas in the field of agricultural sciences, engineering, and technology in a broad sense. The scope of J-TEP includes (but is not limited to) the fields of: water-plant-land resource engineering, agricultural environment, bioprocess engineering, post-harvest and agro-industrial technology, farm power and equipment, renewable energy, agro-industrial wastes, control systems and artificial intelligence, robotics, and IoT applications in agriculture. Since 2016, J-TEP has been accredited as the journal with SINTA-2 rank based on the Decree of the Director General of Higher Education No. 164/E/KPT/2021. Starting from Vol. 11, No.1 (March 2022) J-TEP is published in English. Starting in 2025, J-TEP is published 6 (six) times a year: February, April, June, August, October, and December. J-TEP is open to the public and invites researchers, students, practitioners, and observers in the world of agricultural engineering and agricultural technology to submit their scientific papers.

Chief Editor

Prof. Dr. Ir. Agus Haryanto, M.P. (Universitas Lampung)

Section Editors

Dr. Ir. Sugeng Triyono, M.Sc (Universitas Lampung)
Dr. Warji, S.T.P., M.Si (Universitas Lampung)
Prof. Dr. Dra. Maria Erna Kustyawati, M.Sc. (Universitas Lampung)
Prof. Dr. Ir. Santosa, M.P. (Universitas Andalas)
Ahmad Tusi, S.T.P., M.Si., Ph.D. (Universitas Lampung)
Dr. Ansar, S.T.P., M.Si. (Universitas Mataram)
Prof. Dr. Diding Suhandy, S.T.P., M.Agr. (Universitas Lampung)
Dr. Siti Suharyatun, S.T.P., M.Si. (Universitas Lampung)
Dr. Cicih Sugianti, S.T.P., M.Si. (Universitas Lampung)
Dr. Ir. Gatot Pramuhadi, M.Si. (IPB University).
Bayu Dwi Apri Nugroho, S.T.P., M.Agr., Ph.D. (Universitas Gadjah Mada)
Dr. Arif Dwi Santoso, S.Pi, M.Eng (Badan Riset dan Inovasi Nasional)
Dr. Mareli Telaumbanua, S.T.P., M.Sc. (Universitas Lampung)
Sri Waluyo, S.T.P., M.Si. Ph.D. (Universitas Lampung)
Dr. Ir. Mahmud Achmad, M.P. (Universitas Hasanudin)
Dr. Siswoyo Soekarno, S.T.P., M.Eng. IPM (Universitas Jember)

Editorial Boards

Febryan Kusuma Wisnu, S.T.P., M.Sc. (Universitas Lampung)
Witaningsih, S.T., M.T. (Universitas Lampung)
Merry Meyliana Leowan, S.T. (Universitas Lampung)

Jurnal Teknik Pertanian Lampung is published by Agricultural Engineering Department, University of Lampung in collaboration with PERTETA.

Mail address:

Jurusan Teknik Pertanian, Fakultas Pertanian Universitas Lampung
Jl. Soemantri Brodjonegoro No.1, Telp. 0721-701609 ext. 846
Website :<http://jurnal.fp.unila.ac.id/index.php/JTP>
Email :jurnal_tep@fp.unila.ac.id

PREFACE

With gratitude to Allah the Almighty, Jurnal Teknik Pertanian Lampung (J-TEP) Volume 15, No. 1, February 2026 can finally be published. This edition contains 42 (forty-two) papers from various fields of study in the world of Agricultural Engineering and Agricultural Technology including cultivation engineering, bioprocess technology, wood engineering, design, modeling, renewable energy, and others.

On this occasion, we would like to express our deepest gratitude to the authors for their contribution to J-TEP and to the reviewers of this journal for their participation and contribution in improving the quality of scientific papers published in this edition. Finally, I hope that J-TEP can be useful for the community and make a meaningful contribution to the development of science and technology, especially in the field of agricultural engineering and technology.

Editors

Content	Page
<i>Preface</i>	
The Potential of <i>Bacillus</i> sp. and FOBIO Biopesticide with Mustard Greens (<i>Brassica rapa</i> L. var. <i>parachinensis</i>) as Bioremediation Agents for Cadmium <i>Dykha Maretha Setyawan, Endang Tri Wahyu Prasetyawati, Sri Wiyatiningsih</i>	1–9
Geospatial Mapping of Smallholder Oil Palm Plantation in Tanah Laut Regency Using QGIS <i>Jaka Darma Jaya, Rizqie Mayasari</i>	10–18
Design and Development of a Web-Based Thermal Application for Vapor Compression Refrigeration Systems <i>Ratu Yanra Dewi, Muhamad Yulianto, Mohamad Solahudin, Leopold Oscar Nelwan, Ida Afriliana, Roni Darpono, N Nasruddin</i>	19–32
Effect of Gelatin and Iota-Caragenan (<i>Eucheuma spinosum</i>) on the Quality of Green Cincau (<i>Premna oblongifolia</i> Merr) Jelly <i>Julfi Restu Amelia, Aura Putri Aryanti</i>	33–43
The Potential of <i>Streptomyces</i> spp. from Mangrove Land to Control Root-Knot Nematodes <i>Chowasil Ma'budah, Penta Suryaminarsih, Wiwin Windriyanti</i>	44–51
Estimation Model of Robusta Coffee (<i>Coffea canephora</i>) Productivity Based on Soil, Plant, and Remote Sensing Data <i>Mochtar Fauzi, Nisfi Fariatul Ifadah, Soemarno Soemarno, Kurniawan Sigit Wicaksono</i>	52–62
The Use of Botanical Preservatives to Maintain the Quality of Smoked Catfish <i>Edo Saputra, Rokhani Hasbullah, Emmy Darmawati, Mala Nurilmala</i>	63–78
Effect of Methanol–NaOH Catalyst Variations on the Properties and Engine Performance of B50 Biodiesel from Waste Cooking Oil <i>Suardi Suardi, Hariyono Hariyono, Faisal Mahmuddin, M. Rusydi Alwi, Muhammad Uswah Pawara, Alamsyah Alamsyah, Wira Setiawan</i>	79–89
Study of Thermal Imaging Potential for Early Detection of <i>Fusarium</i> sp. Pathogen on Rice Seeds (<i>Oryza sativa</i> L.) <i>Avianita Agustianti, Herry Nirwanto, Maroeto Maroeto</i>	90–100
Liquid Smoke Derived from Sago Processing Solid Waste: Organic Compound Composition and Its Application for Ironwood (<i>Intsia bijuga</i>) Seedlings <i>Herman Siruru, Wilma Nancy Imlabla, Ismail Budiman</i>	101–109
Kinetics of Thermal-Induced Physical Quality Alterations in Chicken Meat Processing <i>Nadya Klaresza Audrey, Eko Hari Purnomo, Nur Wulandari</i>	110–123
Flood Study of Sungai Penuh City in the Batang Merao Watershed (Case Study: Hampanan Rawang District) <i>Ary Firmana, Eka Oktariyanto Nugroho, Aziz Rizal Prasetyo, Maulya Wijayanthi Sulistiyani, Adhyatma Taufik Akbar</i>	124–134

Factors Affecting the Extent of Agricultural Land Conversion on the Household Economy of Rice Farmers	135–145
<i>Rezza Hardanovita, Nuriah Yuliati, Gyska Indah Harya</i>	
Design of Internet of Things (IoT)-Based Control System on a Hybrid Drying Machine for Sengon Wood Pallets	146–152
<i>Yefri Chan, Suzuki Sofyan</i>	
Design and Performance Evaluation of an IoT-Based Automatic Airflow Control System for a PV/T Solar Dryer with Silica Gel Adsorption Heat Storage	153–163
<i>Putri Arsyaf dini Oktavionry, Leopold Oscar Nelwan, I Dewa Made Subrata</i>	
Design of Portable Rainfall Simulator Prototype	164–174
<i>Suhardi Suhardi, Bambang Marhaenanto, Dedy Wirawan Soedibyo</i>	
Land Suitability Evaluation for Durian (<i>Durio zibethinus</i> Murr.) Cultivation Based on Nutrient Retention	175–183
<i>Bagas Dewa Setiawan, Purwadi, Maroeto</i>	
Comparative Evaluation of Manual and Herbicide-Based Weed Control in the Immature Oil Palm Phase	184–197
<i>Heru Wansyah Harahap, Hartini</i>	
Analysis and Prediction of Water Availability Criteria in Potato Using High-Resolution Aerial Photography	198–212
<i>Istika Nita, Aditya Nugraha Putra, Shofie Rindi Nurhutami, Michelle Talisia Sugiarto, Novandi Rizky Prasetya</i>	
Verification of Alternative Agar Plate Method for Quantitative Analysis of Yeasts and Molds in Cocoa Products	213–222
<i>Chairia Faulita Ananti, Uswatun Hasanah, Harsi Dewantari Kusumaningrum</i>	
The Effect of Planting Media and Nutrient Flow on the Growth of Hydroponic Lettuce with the NFT System	223–232
<i>Ahyaniah Dewi Syabarina, Ramdan Hidayat, Didik Utomo Pribadi</i>	
Genetic Variability of Lumbu Kuning and Lumbu Hijau Garlic Varieties Induced by ⁶⁰Co Gamma Ray Irradiation	233–242
<i>Adin Novitasari, Afifuddin Latif Adiredjo, Lita Soetopo</i>	
Sustainable Extraction of Cinnamon Phenolics through Synergy of Green Solvents and Microwave-Assisted Technology	243–255
<i>Nanin Agustin, Devi Yuni Susanti, Muhammad Prasetya Kurniawan</i>	
NIR-Based Predictive Modelling for the Quantification of Sucrose, Glucose, and Fructose in Brown Sugar from Oil Palm Trunk Sap	256–267
<i>Sharly Claudia Alghai Sani, Dase Hunaefi, Faleh Setia Budi, Yessie Widya Sari, Ilham Akbar Ibrahim, Noviani Rustanto</i>	
Risk Analysis of Greenhouse-Based Paprika Farming Using Failure Mode and Effect Analysis (FMEA)	268–276
<i>Ella Stevani Simbolon, Teguh Soedarto, Sri Widayanti</i>	
Effect of Stirring Technique Variations and Roasting Time on the Chemical, Microbiological, and Sensory Characteristics of Shredded Spiced Fish	277–289
<i>Puan Mutia Ayunisa, Dewi Sartika, Gusri Akhyar, Sri Hidayati, Sussi Astuti</i>	

Physicochemical Characteristics and Stability of Antioxidant Extracts from Different Varieties of Purple Sweet Potato (<i>Ipomoea batatas</i> L.)	290–300
<i>Tagor M Siregar, Fandy Kusno</i>	
The Impacts of Magnetic Fields on Combustion Characteristics of Virgin Coconut Oil Droplets	301–312
<i>Wigo Winarko, Yuke Hary Laksono</i>	
Effect of Combined Application of ZA Fertilizer and Goldensoil G-03 Organic Powder Fertilizer on the Growth and Yield of Lumbu Putih Garlic (<i>Allium sativum</i> L.)	313–321
<i>Krisna Wahyu Stianingsih, Makhziah, Felicitas Deru Dewanti</i>	
Effects of ZnO-Based Smart Urea Coating on Ammonium Release and Characterization of Soil Ureolytic Bacteria in Loamy Soil	322–334
<i>Fathia Meidy Nurindriana, M Wasilul Lutfi, Atiqah Aulia Hanuf, Soemarno, Sugeng Prijono</i>	
Effect of Solvent Type on the Antibacterial Activity of <i>Trigona laeviceps</i> Propolis Extract	335–345
<i>Intan Nurul Azni, Dede Robiatul Adawiyah, Uswatun Hasanah, Nancy Dewi Yuliana</i>	
Development of An Automated Workflow for Spatial Modeling of Erosion Rates in The Upstream Cisanggarung Watershed Using Model Builder-Based USLE-GIS Integration	346–360
<i>Tri Wahyudin Ahmad, Muhammad Syahril Badri Kusuma, Faizal Immaduddin Wira Rohmat, Arief Yudho Wicaksono, Vika Febriyani</i>	
Analysis of Soil Fertility Status and Capability Based on Slope and Land Use	361–371
<i>Wahyu Riska Putri Ardila, Purwadi, Fitri Wijayanti</i>	
Smart Solar Dome Dryer: IoT-Integrated Automatic Hybrid Drying System for Cereal Grains	372–384
<i>Hanis Adila Lestari, Luthfi Wahab, Triat Adi Yuwono</i>	
Effect of Thawing Process on the Quality of Chicken Thigh Meat	385–395
<i>Anggita Reizda Siman, Winiati Pudji Rahayu, Uswatun Hasanah</i>	
Analysis of Clove Agroforestry Productivity and Sustainability Using a Systemic Approach (MDS RAP-AFS) in Wolo District, Kolaka Regency	396–407
<i>Andi Apriani Silondae, Sitti Rosmalah, Hartati, Adlina Husni Putri</i>	
Sensory Profiling of Brewed Robusta Cascara Tea Flavored with Clove and Cinnamon Based on the Rate-All-That-Apply (RATA) Method	408–418
<i>Firza Fariansyah Difandra, Riski Ayu Anggreini, Hadi Munarko</i>	
Simulation of Design Flood Discharge under Projected Land Cover Scenarios Using ANN–MOLUSCE and HEC-HMS in the Cijangkelok Watershed	419–430
<i>Vika Febriyani, Yadi Suryadi, Tri Wahyudin Ahmad, Arief Yudho Wicaksono, Yosephina Puspa Setyoasri</i>	
Performance Evaluation of a Prototype Rotary Dryer for Granulated Palm Sugar Drying	431–444
<i>Gilang Ramdani, Agus Sutejo, Wawan Hermawan, Annastasha Diandra Putri</i>	
Physical and Chemical Characteristics of Cookies Based on Modified Janten Banana Flour with Cassava Starch Substitution	445–455
<i>Zukryandry, Widia Rini Hartari, Maryanti, Febrina Delvitasari</i>	

- Evaluation of Sustainable Environmentally Friendly Agriculture: Empirical Evidence in Ngawi Regency** 456–469
Rita Parmawati, Amin Setyo Leksono, Aminudin Afandhi, Soemarno, Akhmad Adi Sulianto
- Analysis of Soil Quality Index in Several Land Use Units in the Manten Sub-Watershed** 470–477
Pradana Fajar Gumilar, Maroeto, Bakti Wisnu Widjajani

ARTICLE WRITING GUIDELINES FOR AUTHORS

1) Manuscript: The Editorial Board accepts scientific papers in either Indonesian or English, with the following requirements:

- a. Manuscripts must be typed on A4-sized paper (210 mm × 297 mm), double-spaced, using Times New Roman font, 12 pt. Margins should be 3 cm on the left, right, top, and bottom. The length of the manuscript should not exceed 20 pages, including abstract, references, tables, and figures. All tables and figures must be embedded in the manuscript and numbered consecutively as they appear. The manuscript should be structured as follows: Title; Author(s) with footnotes indicating institutional affiliation(s); Introduction; Materials and Methods; Results and Discussion; Conclusion and Recommendations; References; and Appendices (if necessary). A writing template can be downloaded at <http://jurnal.fp.unila.ac.id/index.php/JTP>.
- b. **Abstracts** must be written in both Indonesian and English, with no more than 200 words. They should provide clear and concise information that is easy to understand, briefly covering the background, objectives, methods, main findings, and conclusions of the study.
- c. **Introduction:** Should present the background of the problem, relevant previous findings, and the objectives of the study or engineering work.
- d. **Materials and Methods:** Should clearly describe the materials and methodologies used, including the location and time of the study, as well as the statistical analyses applied. References should be provided for specific methods.
- e. **Results and Discussion:** Should present the research or engineering results, their relevance to problem-solving, implications, similarities and differences with previous studies, and potential for further development. Results may be presented in the form of figures, graphs, or tables.
- f. **Conclusion and Recommendations:** Should summarize the key findings, their contribution to addressing the problem, and provide recommendations for future research or engineering work.
- g. **References:** Must be arranged alphabetically. The format is as follows: Author's family name/surname followed by the initials of the first name. For the second and subsequent authors, write in normal order.
 - *Journal* *article:*
Tusi, A., & Rosadi, R.A.B. (2009). Aplikasi irigasi defisit pada tanaman jagung. *Jurnal Irigasi*, 4(2), 120–130.
 - *Book:*
Keller, J., & Bleisner, R.D. (1990). *Sprinkle and Trickle Irrigation*. New York: AVI Publishing Company Inc.
- h. **Units:** All measurements must follow the International System of Units (SI), e.g., m (meter), N (newton), °C (temperature), kW and W (power), etc.

2) Manuscript Submission: Manuscripts should be submitted in soft copy to the following address:

Editorial Office, J-TEP (Journal of Agricultural Engineering, University of Lampung)

Department of Agricultural Engineering, Faculty of Agriculture

University of Lampung

Jl. Sumantri Brodjonegoro No. 1

Telp. +62-721-701609 ext. 846

Website: <http://jurnal.fp.unila.ac.id/index.php/JTP>

Email: jurnal_tep@fp.unila.ac.id

3) Review Process

During the submission, peer review, and acceptance stages, all correspondence with the author(s) will be conducted via email.

4) Editorial and Reviewer Rights

Reviewers have the right to evaluate, correct, add, or remove content from the manuscript if deemed necessary, without altering the overall purpose and objectives of the study.