

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. Starting in 2019, J-TEP is published 4 (four) times a year: March, June, September, and December. Since 2016, J-TEP has been accredited to the SINTA-3 journal based on the Decree of the Director General of Higher Education No.21/E/KPT/2018, and since Vol. 11, No. 3 (September 2021) J-TEP has been accredited as a SINTA-2 journal based on the Decree of the Director General of Higher Education, Research and Technology No. 164/E/KPT/2021. Starting from Vol. 11, No.1 (March 2022) J-TEP is published in English. 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**

Prof. Dr. Ir. Sugeng Triyono, M.Sc. (Universitas Lampung)  
Dr. Ir. Nora Herdiana Pandjaitan, D.E.A. (IPB University)  
Prof. Dr. Dra. Maria Erna Kustyawati, M.Sc. (Universitas Lampung)  
Dr. Warji, S.T.P., M.Si. (Universitas Lampung)  
Ahmad Tusi, S.T.P., M.Si., Ph.D. (Universitas Lampung)  
Dr. Cilih Sugianti, S.T.P., M.Si. (Universitas Lampung)  
Dr. Ansar, S.T.P., M.Si. (Universitas Mataram)  
Dr. Siti Suharyatun, S.T.P., M.Si. (Universitas Lampung)  
Prof. Diding Suhandy, S.T.P., M.Agr., Ph.D. (Universitas Lampung)  
Bayu Dwi Apri Nugroho, S.T.P., M.Agr., Ph.D. (Universitas Gadjah Mada)  
Dr. Ir. Sigit Prabawa, M.Si. (Universitas Sebelas Maret)  
Dr. Mareli Telaumbanua, S.T.P., M.Sc. (Universitas Lampung)

#### **Editorial Boards**

Febryan Kusuma Wisnu, S. T.P., M.Sc. (Universitas Lampung)  
Witaningsih, S.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](mailto:jurnal_tep@fp.unila.ac.id)

## **PREFACE**

With gratitude to Allah the Almighty, Jurnal Teknik Pertanian Lampung (J-TEP) Volume 13, No. 4, December 2024 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>	
<b>Environmentally Friendly Paving Block Based on Wood Waste: The Effect of Rubber Wood Waste Content on the Physical-Mechanical Properties of Paving Block</b> <i>Daffa Naufalian Fauzi, Bagus Saputra, Melya Riniarti, Duryat Duryat, Intan Fajar Suri, Wahyu Hidayat</i>	997-1005
<b>Increasing Physical Soil Quality by Using Rice Straw Biomass</b> <i>Sumiyati Sumiyati, I Wayan Tika, Ni Nyoman Sulastri, Mentari Kinasih</i>	1006-1012
<b>Effect of Benzylaminopurine (BAP) and Coconut Water on the Growth of <i>Bucephalandra</i> sp. in Vitro</b> <i>Alfira Damayanti Septianingsih, Makhziah Makhziah, Sukendah Sukendah</i>	1013-1022
<b>Avoiding Flood by Improving Cross-Sectional Capacity through River Normalization</b> <i>Muzhaffar Harits, Asep Sapei, Nora Herdiana Pandjaitan</i>	1023-1035
<b>Evaluating the Antioxidant Activity and Stability of Pigmented Rice Extract</b> <i>Tagor M Siregar, Daniel C Miarsa</i>	1036-1050
<b>The Use of the Normalized Difference Red Edge (NDRE) Vegetation Index from Multispectral Cameras Mounted on Unmanned Aerial Vehicle to Estimate the Nutrient Content in Oil Palm Leaves</b> <i>Badi Hariadi, Hermantoro Sastrohartono, Andreas Wahyu Krisdiarto, Sukarman Sukarman, Tri Haryo Sagoro, Septa Primananda, Arief Rahmad Maulana Akbar, Arief Ika Uktoro</i>	1051-1063
<b>Exploring the Impact of Temperature and Solvent Ratio on Phenol and Flavonoid Levels in <i>Alpinia galangal</i> L. Extract Using Evaporative Vacuum Cooling</b> <i>Dina Wahyu Indriani, Firdha Dwi Anggraini, Yusuf Hendrawan, Anang Lastriyanto</i>	1064-1076
<b>Growth Rate and Production of Hybrid and Local Maize (<i>Zea Mays</i> L.) in Response to Various Doses of Nitrogen Fertilization</b> <i>Ni Ketut Wirastiti, Kukuh Setiawan, Tumiar Katarina Manik</i>	1077-1089
<b>Drying Kinetics of Banana Chips: A Modeling Approach</b> <i>Didik Hermanuadi, Iswahyono Iswahyono, Elly Kurniawati, Siti Djamila, Amal Bahariawan</i>	1090-1100
<b>Soil Physical Properties of Oil Palm Plantations in Tidal Areas of Peatland</b> <i>Herbin Dinto Simanullang, Dean Denaneer, Suratni Afrianti</i>	1101-1108

<b>Design of Scheduled Fog Irrigation System with ESP 32 in Mustard Seedbed (Brassica juncea L.)</b>	1109-1120
<i>Joko Sumarsono, Ida Ayu Widhiantari, Gagassage Nanaluih De Side, I Ketut Manik Widhiantara</i>	
<b>Performance Analysis of Disc Mill Type FFC-15 Grinder for Making Charcoal Husk Flour</b>	1121-1131
<i>Ridwan Siskandar, Billi Rifa Kusumah, Lusia Cipto Astuti</i>	
<b>The Effect of Brand Image, Positive Emotions, and Consumer Crowd on Consumer Satisfaction of NPK Liquid-Fertilizer Products: An Empirical Analysis</b>	1132-1141
<i>Silvina Agustina, Silvana Maulidah, Agustina Shinta</i>	
<b>Application of Foam Mat Drying Method for the Production of Instant Red Ginger Powder using Microwave</b>	1142-1150
<i>Dian Purbasari, Wahyu Winda Lestari, Sutarsi Sutarsi, Ning Puji Lestari, Iwan Taruna</i>	
<b>Sensory Study and Financial Feasibility Analysis of Alpinia galangal Fish Shredded Products</b>	1151-1159
<i>Fadli Alamsyah, Dewi Sartika, Sussi Astuti, Wisnu Satyajaya, Sri Hidayati, Puan Mutia Ayunisa</i>	
<b>Study of Types of Packaging Materials and Storage Temperature on The Quality of Soybean Seeds (Glycine max L. Merrill)</b>	1160-1170
<i>Ma'sumah Ma'sumah, Ida Retno Moeldjani, Sutini Sutini</i>	
<b>Rainfall-Runoff Modelling in Tropical River Basin for Water Conservation Planning Using Water Recharge Ponds</b>	1171-1181
<i>M Yusfan Yuzanni, Chandra Setyawan, Sahid Susanto, Yekti Nugraheni</i>	
<b>Prediction of Phenotypic Parameters of Sugarcane Plants Based on Multispectral Drone Imagery and Machine learning</b>	1182-1195
<i>Febri Hasskavendo, Mohamad Solahudin, Supriyanto Supriyanto, Slamet Widodo</i>	
<b>Bio-physico-chemical Soil Characteristic: Intensive Tillage vs. No Tillage</b>	1196-1205
<i>Reni Ustiatik, Ayu Putri Ariska, Resa Kharisma Ramadhan, Novryanti Rizqi Aziz, Syamsu Ridzal Indra Hadi, R Muhammad Yusuf Adi Pujo Nugroho, Maydella Vista Putri Rinandy, Muhammad Taufik Hidayat, Wikan Agung Nugroho, Syahrul Kurniawan</i>	
<b>Hydrological Performance of Way Linti Watershed Based on Discharge Fluctuation Coefficient, Runoff Coefficient, and Sediment Load</b>	1206-1215
<i>Alfi Sofyan, Slamet Budi Yuwono, Rudi Hilmanto, Agus Setiawan, Rahmat Safe'i</i>	
<b>Prediction of Block Production in Oil Palm Plantation Based on Canopy Cover Area and Vegetation Index Using Multispectral Aerial Photographs</b>	1216-1225
<i>Tri Haryo Sagoro, Andreas Wahyu Krisdiarto, Hermantoro Hermantoro</i>	

<b>Potential Analysis of Biomass Briquettes from Sugarcane Milling Waste for Boiler and Generator Turbines Stations</b>	1226-1236
<i>Makbul Hajad, Muhammad Hafidz Syahputra, Raditya Yulianta, Radi Radi, Sri Markumningsih, Bambang Purwantana</i>	
<b>Optimization of used engine oil Furnace Design with Initial Heater</b>	1237-1248
<i>Muhammad Sahbudin, Wawan Hermawan, Agus Sutejo</i>	
<b>Artificial Lighting System Design with PWM Control for the Growth of Kangkung Microgreen</b>	1249-1261
<i>Muhammad Fauzan, Syukriyadin Syukriyadin, Fahri Helta, Syahrizal Syahrizal, Alfisyahrin Alfisyahrin</i>	
<b>Performance Analysis of a Multi Seed Smart Dryer Machine for Drying Peanuts (<i>Arachis hypogaea</i> L.)</b>	1262-1271
<i>Siswoyo Soekarno, Fina Firdiyanti, Soni Sisbudi Harsono, Bambang Marhaenanto</i>	
<b>Effect of Codigestion of Rice Straw, Fish Meal, and Cow Manure on Biogas Production and Quality of Solid Bioslurry Fertilizer</b>	1272-1284
<i>Sri Ismiyati Damayanti, Rifki Amirul Hakim, Anggi Anggraeni, Yuni Saputri</i>	
<b>Utilization of Environmentally Friendly Energy in Organic Fertilizer Processing Machine</b>	1285-1294
<i>Yendi Esy, Husen Asbanu, Danny Faturachman, Yefri Chan</i>	
<b>Assessment of Land Suitability for Enhancing Key Crop Commodities: Pineapple, Coffee, and Mango</b>	1295-1307
<i>Maroeto Maroeto, Rosyda Priyadarshini, Agung Winarno, Ken Bening Jiwa Jeni, Alexandra Neovita Tanaya</i>	
<b>Geographic Information System Design for Irrigation System Performance Index Main Network</b>	1308-1319
<i>Heru Ernanda, Idah Andriyani, Rufiani Nadzirah, Indarto Indarto</i>	
<b>Automated Conveyor System of Sorting and Grading for Red Chili Pepper (<i>Capsicum annum</i> L.) using Image Processing and Artificial Neural Network</b>	1320-1333
<i>Hanis Adila Lestari, Anri Kurniawan, Luthfi Wahab</i>	
<b>Optimization of Mango Flour Formulation (<i>Mangifera indica</i> L) Arumanis Variety using Response Surface Methodology</b>	1334-1343
<i>Silvia Oktavia Nur Yudiastuti, Titik Budiati, Yossi Wibisono, Oryza Ardhiarisca, Findi Citra Kusumasari, Wiwik Handayani, Yesi Indah Dwi Kusuma Hariyanti</i>	
<b>Energy Analysis in the Production of Purple Sweet Potato Crackers</b>	1344-1351
<i>Renny Eka Putri, Melia Elius Putri Gurning, Ifmalinda Ifmalinda, P.A Oktavionry</i>	
<b>The Physiological Response of Germination and Growth in Solanaceae Plants (<i>Capsicum frutescens</i>, <i>Solanum melongena</i>, <i>Solanum lycopersicum</i>) at Different Salinity Levels</b>	1352-1360
<i>Nelly Vikiladyla Della, Endah Dwi Hastuti, Nintya Setiari</i>	

<b>Comparison of Two Fuzzification Algorithms (EC-pH and EC-pH Error Error Difference Fuzzifications) of Nutrient Solution Control in Plant Factory</b>	1361-1371
<i>Ardiansyah Ardiansyah, Bastian Seno Aji, Eni Sumarni</i>	
<b>Impact of Pyrolysis Temperature and Jatropha Seed Adhesive on the Properties of Bio-charcoal from Young Coconut Waste</b>	1372-1382
<i>Khairul Anwar, Mahidin Mahidin, Ichwana Ramli, Muhammad Faisal, Agustami Sitorus</i>	
<b>Quality Characteristics of Functional Beverages from Moringa Leaf Juice with the Addition of Red Ginger Juice and Sucralose</b>	1383-1394
<i>Julfi Restu Amelia, Bella Roslia Syafitri</i>	
<b>The Application of Nanobubble Technology in Hydroponic SWU-01 to Increase Dissolved Oxygen Concentration and Lettuce Plant Growth</b>	1395-1402
<i>Asep Yusuf, Chay Asdak, Mimin Muhaemin, Eza Zahrotul Fuadah, Sophia Dwiratna, Muhammad Achirul Nanda, Anto Tri Sugiarto, Hilman Syaeful Alam</i>	
<b>Drying Characteristics of Papaya (<i>Carica Papaya</i> L.) Fruit Leather Using Microwave Oven</b>	1403-1409
<i>Dian Purbasari, Vicky Andhik Wicaksono, Iwan Taruna, Nur Ida Winni Yosika</i>	
<b>Developing Sustainable Competitive Advantage: The Role of Dynamic Capability and Innovation Performance in Excelsa Coffee Bean Industry</b>	1410-1421
<i>Siti Artika, Hery Toiba, Dwi Retno Andriani</i>	
<b>Distribution of Water Quality Parameters Using Equation Multiple Linear Regression</b>	1422-1431
<i>Sri Wahyuningsih, Idah Andriyani, Siswoyo Soekarno, Deffa Khoirulloh</i>	
<b>The Use of Gamal Leaves (<i>Gliricidia sepium</i>) to Accelerate Fresh Fruit Bunch Detachment and Improve the Quality of Crude Palm Oil</b>	1432-1441
<i>Giyanto Giyanto, Ika Ucha Pradipta Rangkuti, Pada Mulia Raja, Rafael Remit Winardi, Mahyunis Mahyunis, Reza Ashari, Jenny Elisabeth</i>	
<b>REVIEW</b>	
<b>Biochar and Humic Substances Roles for Nitrogen Transformation in Agriculture</b>	1442-1452
<i>Gagad Restu Pratiwi, Arinal Haq Izzawati Nurrahma</i>	

## PEDOMAN PENULISAN ARTIKEL BAGI PENULIS

- 1) **Naskah:** Redaksi menerima sumbangan naskah/tulisan ilmiah dalam bahasa Indonesia atau bahasa Inggris, dengan batasan sebagai berikut :
  - a. Naskah diketik pada kertas ukuran A4 (210mm x 297mm) dengan 2 spasi dan ukuran huruf Times New Roman 12pt. Jarak tepi kiri, kanan, atas, dan bawah masing-masing 3 cm. Panjang naskah tidak melebihi 20 halaman termasuk abstrak, daftar pustaka, tabel dan gambar. **Semua tabel dan gambar disisipkan dalam naskah** dengan penomoran sesuai dengan yang tertera dalam naskah. Naskah disusun dengan urutan sebagai berikut: Judul; Nama Penulis disertai dengan catatan kaki tentang instansi tempat bekerja; Pendahuluan; Bahan dan Metode; Hasil dan Pembahasan; Kesimpulan dan Saran; Daftar Pustaka; serta Lampiran jika diperlukan. Template penulisan dapat didownload di <http://jurnal.fp.unila.ac.id/index.php/JTP>
  - b. **Abstrak (Abstract)** dalam bahasa Indonesia dan bahasa Inggris, tidak lebih dari 200 kata. Mengandung informasi yang tertuang dalam penulisan dan mudah untuk dipahami. Ringkasan (abstract) harus memuat secara singkat latar belakang, tujuan, metode, serta kesimpulan dan yang merupakan *high light* hasil penelitian.
  - c. **Pendahuluan:** memuat latar belakang masalah yang mendorong dilaksanakannya perekayasaan dan penelitian, sitasi dari temuan-temuan terdahulu yang berkaitan dan relevan, serta tujuan perekayasaan atau penelitian.
  - d. **Bahan dan Metode:** secara jelas menerangkan bahan dan metodologi yang digunakan dalam perekayasaan atau penelitian berikut dengan lokasi dan waktu pelaksanaan, serta analisis statistik yang digunakan. Rujukan diberikan kepada metoda yang spesifik.
  - e. **Hasil dan Pembahasan:** Memuat hasil-hasil perekayasaan atau penelitian yang diperoleh dan kaitannya dengan bagaimana hasil tersebut dapat memecahkan masalah serta implikasinya. Persamaan dan perbedaannya dengan hasil perekayasaan atau penelitian terdahulu serta prospek pengembangannya. Hasil dapat disajikan dengan menampilkan gambar, grafik, ataupun tabel.
  - f. **Kesimpulan dan Saran:** memuat hal-hal penting dari hasil penelitian dan kontribusinya untuk mengatasi masalah serta saran yang diperlukan untuk arah perekayasaan dan penelitian lebih lanjut.
  - g. **Daftar Pustaka:** disusun secara alfabetis menurut penulis, dengan susunan dan format sebagai berikut: Nama penulis didahului nama family/nama terakhir diikuti huruf pertama nama kecil atau nama pertama. Untuk penulis kedua dan seterusnya ditulis kebalikannya. Contoh:
    - Kepustakaan dari Jurnal:  
Tusi, Ahmad, dan R.A. Bustomi Rosadi. (2009). Aplikasi Irigasi Defisit pada Tanaman Jagung. *Jurnal Irigasi*, 4(2): 120-130.
    - Kepustakaan dari Buku:  
Keller, J., and R.D. Bleisner. (1990). *Sprinkle and Trickle Irrigation*. AVI Publishing Company Inc. New York, USA.
  - h. **Satuan:** Satuan harus menggunakan system internasional (SI), contoh : m (meter), N (newton), °C (temperature), kW dan W (daya), dll.
- 2) **Penyampaian Naskah:** Naskah/karya ilmiah dapat dikirimkan ke alamat dalam bentuk *soft copy* ke :  
**Redaksi J-TEP (Jurnal Teknik Pertanian Unila)**  
Jurusan Teknik Pertanian, Fakultas Pertanian  
Universitas Lampung  
Jl. Sumantri 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](mailto:jurnal_tep@fp.unila.ac.id)
- 3) Selama proses penerimaan karya ilmiah, penelaahan oleh Reviewer, sampai diterimanya makalah untuk diterbitkan dalam jurnal akan dikonfirmasi kepada penulis melalui email.
- 4) Reviewer berhak melakukan penilaian, koreksi, menambah atau mengurangi isi naskah/tulisan bila dianggap perlu, tanpa mengurangi maksud dan tujuan penulisan.