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13 Februari 2023 pukul 07.32

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Kepada: danapriatna.nana@gmail.com

Cc: executive\_editor.pertanika@upm.edu.my, journal.officer-1@upm.edu.my

13-Feb-2023

Dear Dr. Danapriatna:

Welcome to the Journal of Tropical Agricultural Science - ScholarOne Manuscripts site for online submission and review.

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Nana Danapriatna &lt;danapriatna.nana@gmail.com&gt;

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**Journal of Tropical Agricultural Science - Manuscript ID JTAS-2704-2023**

1 pesan

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**Journal of Tropical Agricultural Science** <onbehalf@manuscriptcentral.com>

13 Februari 2023 pukul 10.16

Balas Ke: journal.officer-1@upm.edu.my

Kepada: danapriatna.nana@gmail.com

Cc: danapriatna.nana@gmail.com, raniisma@unismabekasi.ac.id, r.luthifiadi@unismabekasi.ac.id, m.dede.geo@gmail.com

13-Feb-2023

Dear Dr. Danapriatna:

Your manuscript entitled "Effect of Straw Compost (*Oryza sativa* L.) on Crop Production" has been successfully submitted online and is presently being given full consideration for publication in the Journal of Tropical Agricultural Science.

Your manuscript ID is JTAS-2704-2023.

Please mention the above manuscript ID in all future correspondence or when calling the office for questions. If there are any changes in your street address or e-mail address, please log in to ScholarOne Manuscripts at <https://mc.manuscriptcentral.com/upm-jtas> and edit your user information as appropriate.

You can also view the status of your manuscript at any time by checking your Author Center after logging in to <https://mc.manuscriptcentral.com/upm-jtas>.

Thank you for submitting your manuscript to the Journal of Tropical Agricultural Science.

Sincerely,  
Journal of Tropical Agricultural Science Editorial Office



Nana Danapriatna &lt;danapriatna.nana@gmail.com&gt;

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**Journal of Tropical Agricultural Science - JTAS-2704-2023 has been unsubmitted**

1 pesan

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**Journal of Tropical Agricultural Science** <onbehalf@manuscriptcentral.com>

13 Februari 2023 pukul 10.41

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Kepada: danapriatna.nana@gmail.com

Cc: danapriatna.nana@gmail.com, m.dede.geo@gmail.com

13-Feb-2023

NOTE: YOU HAVE ONE CHANCE TO CORRECT YOUR MANUSCRIPT AS PER PERTANIKA'S GUIDELINE

Dear Dr. Danapriatna,

Your manuscript, JTAS-2704-2023, entitled "Effect of Straw Compost (*Oryza sativa* L.) on Crop Production" has been unsubmitted from the Journal of Tropical Agricultural Science. The reason of "unsubmission" is due to the following issue(s):

**1. AUTHOR(S)' INFORMATION (as in publication)**

Please write the postal codes correctly.

**2. TABLES & FIGURE**

Tables and Figure caption should follow the APA 6th style. Please modify it accordingly. Kindly add in the x- and y-axes titles of Figure 1 as well.

**3. AUTHORS' ORCID ID LINKS**

Please provide the authors' ORCID ID links (if available) in another Microsoft Word file.

**4. REFERENCES [IN-TEXT CITATIONS AND REFERENCE LIST]**

References listed in the manuscript does not follow the format of APA 7th Style. When formatting your references (List of References), please follow the APA reference style (7TH EDITION - COMPULSORY). Ensure that the references are strictly in the journal's prescribed style, failing which your article will not be accepted for peer-review.

For example, please check the bibliography/citation format of:

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by referring to the attached file 'Instructions to Authors (15 Dec. 2020)'.

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\* Please state the DOI(s) if it is available;

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\* Please check the in-text citations. Due to the latest policy, for those references that more than 2 authors, kindly use 'et al.';

\* Please change 'and' into '&amp;' in Reference List;

\* Please take note of the authors' name. Kindly do not wrongly cite the first and last name. For example, if the author is "Rahimah Ali", the correct citation should be "Ali, R. (2018)" in Reference List AND "Ali (2018)" in-text; BUT NOT "Rahimah, A. (2018)".

To revise your manuscript, log into <https://mc.manuscriptcentral.com/upm-jtas> and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision.

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Once again, thank you for submitting your manuscript to the Journal of Tropical Agricultural Science and I look forward to receiving your revision.

Sincerely,  
Journal Officer  
Journal of Tropical Agricultural Science Editorial Office

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### 3 lampiran



\* 4.1a.1-Regular-Issue---Submission-Guidelines---Instruction-to-Authors-[JTAS]---15-Dec-2020.doc  
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\* 4.1a.3-Regular-Issue---Declaration-Form.docx  
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\* Pertanika-References-Style--14-Apr-2016----01-3.pdf  
373K



Nana Danapriatna &lt;danapriatna.nana@gmail.com&gt;

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**Journal of Tropical Agricultural Science - Manuscript ID JTAS-2704-2023.R1**

1 pesan

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22 Februari 2023 pukul 01.44

Balas Ke: journal.officer-1@upm.edu.my

Kepada: danapriatna.nana@gmail.com

Cc: danapriatna.nana@gmail.com, m.dede.geo@gmail.com

22-Feb-2023

Dear Dr. Danapriatna:

Your manuscript entitled "Effect of Straw Compost (*Oryza sativa* L.) on Crop Production" has been successfully submitted online and is presently being given full consideration for publication in the Journal of Tropical Agricultural Science.

Your manuscript ID is JTAS-2704-2023.R1.

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Thank you for submitting your manuscript to the Journal of Tropical Agricultural Science.

Sincerely,  
Journal Officer  
Journal of Tropical Agricultural Science Editorial Office



Nana Danapriatna &lt;danapriatna.nana@gmail.com&gt;

**Journal of Tropical Agricultural Science - Decision on Manuscript ID JTAS-2704-2023.R1**

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**Journal of Tropical Agricultural Science** <onbehalf@manuscriptcentral.com>

2 Maret 2023 pukul 15.14

Balas Ke: executive\_editor.pertanika@upm.edu.my

Kepada: danapriatna.nana@gmail.com

Cc: danapriatna.nana@gmail.com, m.dede.geo@gmail.com

02-Mar-2023

Dear Dr. Danapriatna:

Manuscript ID JTAS-2704-2023.R1 entitled "Effect of Straw Compost (*Oryza sativa* L.) on Crop Production" which you submitted to the Journal of Tropical Agricultural Science, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter.

Because we are trying to facilitate timely publication of manuscripts submitted to the Journal of Tropical Agricultural Science, your resubmitted manuscript should be returned to me as soon as possible by 16 Mar. 2023. If it is not possible for you to submit your revision by this date, please contact the journal officer to request for extension. Please DO NOT create a new manuscript ID.

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Once again, thank you for submitting your manuscript to the Journal of Tropical Agricultural Science and I look forward to receiving your revision.

Sincerely,

Chief Executive Editor, Journal of Tropical Agricultural Science

Reviewer(s)' Comments to Author:

Reviewer: 1

Comments to the Corresponding Author

1. Please indicate the source of the decomposer organism (*Laktobacillus* sp., *Rhodopseudomonas* sp., *Actinomycetes* sp., *Streptomyces* sp., yeast, and cellulose decomposing fungus). How did you prepare the inoculum?
2. Give more detail (name of standard methods and references) about the method that you use to analyze the physical and chemical characteristics of soil in Table 1, soil nutrients in Table 3, the content of rice straw compost in Table 4 and rice nutrients in Table 5.
3. Why did you know the increasing nutrient in rice resulted from soil nutrients after straw compost applying?
4. It's better to analyze carbon sequestration in the soil in future work.

Reviewer: 2

Comments to the Corresponding Author

This study examined the effects of rice straw compost on soil characteristics and rice yield, taking into account the principles of regenerative agriculture. However, the prologue's introductory paragraph appears lengthy and lacks conciseness, thereby hindering the clarity of the research question. Furthermore, the knowledge gap, hypothesis, and objectives, which are vital components of the research process, were not adequately elucidated in the paper. The experiment setup and procedure were insufficiently detailed, making it difficult to understand the results obtained. Other recommendations that could improve its overall quality are embedded in the manuscript.

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 **JTAS-2704-2023.R1-MS-Rev-KIT---Comments-on-MS--R2-.pdf**  
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Nana Danapriatna &lt;danapriatna.nana@gmail.com&gt;

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**Journal of Tropical Agricultural Science** <onbehalf@manuscriptcentral.com>

16 Maret 2023 pukul 02.10

Balas Ke: journal.officer-1@upm.edu.my

Kepada: danapriatna.nana@gmail.com

Cc: danapriatna.nana@gmail.com, m.dede.geo@gmail.com

16-Mar-2023

Dear Dr. Danapriatna:

Your manuscript entitled "Effect of Straw Compost (*Oryza sativa* L.) on Crop Production" has been successfully submitted online and is presently being given full consideration for publication in the Journal of Tropical Agricultural Science.

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Thank you for submitting your manuscript to the Journal of Tropical Agricultural Science.

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**Journal of Tropical Agricultural Science** <onbehalf@manuscriptcentral.com>

16 Maret 2023 pukul 09.00

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Kepada: danapriatna.nana@gmail.com

Cc: danapriatna.nana@gmail.com, m.dede.geo@gmail.com

[Kutipan teks disembunyikan]





Nana Danapriatna &lt;danapriatna.nana@gmail.com&gt;

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**Journal of Tropical Agricultural Science - Decision on Manuscript ID JTAS-2704-2023.R2**

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**Journal of Tropical Agricultural Science** <onbehalf@manuscriptcentral.com>

30 Maret 2023 pukul 08.29

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30-Mar-2023

Dear Dr. Danapriatna:

Manuscript ID JTAS-2704-2023.R2 entitled "Effect of Straw Compost (*Oryza sativa* L.) on Crop Production" which you submitted to the Journal of Tropical Agricultural Science, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter.

Because we are trying to facilitate timely publication of manuscripts submitted to the Journal of Tropical Agricultural Science, your resubmitted manuscript should be returned to me as soon as possible by 13 Apr. 2023. If it is not possible for you to submit your revision by this date, please contact the journal officer to request for extension. Please DO NOT create a new manuscript ID.

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Once the revised manuscript is prepared, you can upload it and submit it through your Author Center.

When submitting your revised manuscript, you will be able to respond to the comments made by the reviewer(s) in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s).

**IMPORTANT:** Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.

Once again, thank you for submitting your manuscript to the Journal of Tropical Agricultural Science and I look forward to receiving your revision.

Sincerely,

Chief Executive Editor, Journal of Tropical Agricultural Science

Reviewer(s)' Comments to Author:

Reviewer: 1

Comments to the Corresponding Author

I am satisfied with the revision of this manuscript, this manuscript is accepted.

Reviewer: 2

Comments to the Corresponding Author

The manuscript has undergone significant improvements and partial revisions following the suggestions provided by the reviewers. However, there are still additional suggestions, as demonstrated in the manuscript. Notably, the authors are needed respond fully to all queries and recommendations made by the reviewers, both in the letter of reviewer comments and those embedded in the manuscript, to guarantee that the paper is of the best quality achievable.

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 **JTAS-2704-2023.R2-MS-Rev-KIT---Comments-on-MS--R2-.pdf**  
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Nana Danapriatna  
<danapriatna.nana@gmail.com>

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## Journal of Tropical Agricultural Science - Decision on Manuscript ID JTAS-2704-2023.R3

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**Journal of Tropical Agricultural Science**

18 April 2023

<onbehalf@manuscriptcentral.com>

pukul 13.30

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Kepada: danapriatna.nana@gmail.com

Cc: danapriatna.nana@gmail.com, m.dede.geo@gmail.com

18-Apr-2023

Dear Dr. Danapriatna:

It is a pleasure to accept your manuscript entitled "Effect of Straw Compost (*Oryza sativa* L.) on Crop Production" in its current form for publication in the Journal of Tropical Agricultural Science. The comments of the reviewer(s) who reviewed your manuscript are included at the foot of this letter.

An official acceptance letter will be sent to you from my office in due course of time.

By the way, please fill in the attached copyright form and send it back to [journal.officer-1@upm.edu.my](mailto:journal.officer-1@upm.edu.my) asap.

Thank you for your fine contribution. On behalf of the Editors of the Journal of Tropical Agricultural Science, we look forward to your continued contributions to the Journal.

Sincerely,  
Dr. Chief Executive Editor  
Chief Executive Editor, Journal of Tropical Agricultural Science  
[executive\\_editor.pertanika@upm.edu.my](mailto:executive_editor.pertanika@upm.edu.my)



Nana Danapriatna &lt;danapriatna.nana@gmail.com&gt;

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**Copyright Form and Payment Proof [JTAS-2704-2023]**

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**Nana Danapriatna** <danapriatna.nana@gmail.com>

19 April 2023 pukul 21.16

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Cc: pertanika\_it@upm.edu.my


Bcc: m.dede.geo@gmail.com

Dear Editor  
Journal of Tropical Agricultural Science

Greetings, thank you for the information. We are delighted because your journal accepted our manuscript yesterday. Based on the previous email, hereby, I attached the copyright form and payment proof to JTAS. We waiting for further news from you.

Sincerely,  
Nana Danapriatna

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20 April 2023 pukul 09.04

Kepada: Nana Danapriatna &lt;danapriatna.nana@gmail.com&gt;

Cc: executive\_editor.pertanika@upm.edu.my, pertanika\_it@upm.edu.my

Dear Dr. Nana,

The files are well received with thanks.

Best regards,

[Kutipan teks disembunyikan]

--

**"WAWASAN BERSAMA KEMAKMURAN 2030"**  
**"WITH KNOWLEDGE WE SERVE"**

*(Ms. Syin Ying, Tee on behalf of CEE)*

---

**Journal Officer 1** (UPM Journals)**JOURNAL DIVISION | PERTANIKA**

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43400 Serdang, Selangor, Malaysia.

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Nana Danapriatna &lt;danapriatna.nana@gmail.com&gt;

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**ACCEPTANCE OF MANUSCRIPT ID. JTAS-2704-2023 FOR PUBLICATION**

5 pesan

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20 April 2023 pukul 09.12

Kepada: Nana Danapriatna <danapriatna.nana@gmail.com>, m.dede.geo@gmail.com,  
raniisma@unismabekasi.ac.id, r.luthifiadi@unismabekasi.ac.id

Cc: PERTANIKA EXECUTIVE EDITOR / UPM &lt;executive\_editor.pertanika@upm.edu.my&gt;

Dear Author(s),

I am writing to you in reference to an article entitled "**Effect of Straw Compost (*Oryza sativa* L.) on Crop Production**" with author(s): **Nana Danapriatna, Ismarani, Ridwan Lutfiadi and Moh. Dede**, submitted to *Pertanika* on 22 February 2023 for intended publication in PJTAS.

Your paper has been anonymously peer-reviewed by two to three referees competent in the specialized areas appropriate to your manuscript independently evaluating the scientific quality of the manuscript.

I am pleased to tell you that based on the clarity, technical approach and scientific validity presented; your paper **has been accepted** by the Editorial Board on 18 April 2023, and is **tentatively** scheduled for publication in **PJTAS Vol. 46(3) Aug. 2023**.

Henceforth, your manuscript will be undergoing the publication process. You shall receive the proof of your manuscript from our Pre-Press section, in due course of time. Please review the proof carefully for accuracy and consistency before returning it to the Pre-Press officer.

I thank you for considering *Pertanika* as your preferred Journal.

Best regards,

--

**"WAWASAN BERSAMA KEMAKMURAN 2030"**  
**"WITH KNOWLEDGE WE SERVE"***(Ms. Syin Ying, Tee on behalf of CEE)*

---

**Journal Officer 1** (UPM Journals)**JOURNAL DIVISION | PERTANIKA**Pertanika Editorial Office,  
Bangunan Putra Science Park, 1st Floor,  
IDEA Tower II, UPM-MTDC Technology Centre,  
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43400 Serdang, Selangor, Malaysia.

**Corresponding Author Dashboard**

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## Manuscripts with Decisions

ACTION	STATUS	ID	TITLE	SUBMITTED	DECISIONED
	JO: Tee, Syin Ying	JTAS-2704-2023.R3	Effect of Straw Compost (Oryza sativa L.) on Crop Production	13-Apr-2023	18-Apr-2023
	<ul style="list-style-type: none"> <li>Immediate Accept (18-Apr-2023)</li> </ul>				
	<a href="#">view decision letter</a> <a href="#">Contact Journal</a>		<a href="#">View Submission</a>		
a revision has been submitted (JTAS-2704-2023.R3)	JO: Tee, Syin Ying	JTAS-2704-2023.R2	Effect of Straw Compost (Oryza sativa L.) on Crop Production	16-Mar-2023	30-Mar-2023
	<ul style="list-style-type: none"> <li>Immediate Major Revision (30-Mar-2023)</li> <li>a revision has been submitted</li> </ul>				
	<a href="#">view decision letter</a> <a href="#">Contact Journal</a>		<a href="#">View Submission</a>		
a revision has been submitted (JTAS-2704-2023.R2)	JO: Tee, Syin Ying	JTAS-2704-2023.R1	Effect of Straw Compost (Oryza sativa L.) on Crop Production	22-Feb-2023	02-Mar-2023
	<ul style="list-style-type: none"> <li>Immediate Major Revision (02-Mar-2023)</li> <li>a revision has been submitted</li> </ul>				
	<a href="#">view decision letter</a> <a href="#">Contact Journal</a>		<a href="#">View Submission</a>		
a revision has been submitted (JTAS-2704-2023.R1)	JO: Tee, Syin Ying	JTAS-2704-2023	Effect of Straw Compost (Oryza sativa L.) on Crop Production	13-Feb-2023	13-Feb-2023
	<ul style="list-style-type: none"> <li>Immediate Minor Revision (13-Feb-2023)</li> <li>a revision has been submitted</li> </ul>				
	<a href="#">view decision letter</a> <a href="#">Contact Journal</a>		<a href="#">View Submission</a>		



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**ACCEPTANCE OF MANUSCRIPT ID. JTAS-2704-2023 FOR PUBLICATION**

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raniisma@unismabekasi.ac.id, r.luthifiadi@unismabekasi.ac.id  
Cc: PERTANIKA EXECUTIVE EDITOR / UPM <executive\_editor.pertanika@upm.edu.my>

Dear Author(s),

I am writing to you in reference to an article entitled "**Effect of Straw Compost (*Oryza sativa* L.) on Crop Production**" with author(s): **Nana Danapriatna, Ismarani, Ridwan Lutfiadi and Moh. Dede**, submitted to *Pertanika* on 22 February 2023 for intended publication in PJTAS.

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## Effect of Straw Compost (*Oryza sativa* L.) on Crop Production

Journal:	<i>Journal of Tropical Agricultural Science</i>
Manuscript ID	JTAS-2704-2023.R3
Manuscript Type:	Regular Article
Keywords:	agricultural waste, crop productivity, paddy, rice cultivation, sustainability
Scope of the Journal:	Agronomy < Crop and pasture production < AGRICULTURAL SCIENCES, Crop nutrition < Crop and pasture production < AGRICULTURAL SCIENCES, Soil fertility < Crop and pasture production < AGRICULTURAL SCIENCES, Plant nutrition < Soil and water sciences < AGRICULTURAL SCIENCES
Abstract:	<p>Agricultural productivity depends mainly on soil fertility, particularly in intensified-paddy fields. Heavily relying on synthetic agrochemicals in intensified agriculture potentially be changed to regenerative agriculture that utilizes cultivation wastes to achieve sustainable food production. Therefore, this study aims to analyze the effectiveness of rice (<i>Oryza sativa</i> L.) straw compost for intensified-rice cultivation. Rice straw compost from the previous planting season was composted on the field (in situ). The composting used "Effective Microorganisms version 4" (EM-4) which contains <i>Lactobacillus</i> sp., <i>Rhodopseudomonas</i> sp., <i>Actinomycetes</i> sp., <i>Streptomyces</i> sp., yeast, and cellulose-decomposing fungus. The test field used 4 tons of straw compost and treatments adopted from the local farmers' planting style named Legowo 4:1. Observations on these treatments include the plant nutrients, plant contents, rice components, and yield production. The differences in the results were analyzed using the paired t-test. The results show that the application of straw compost provides a significant increase in dry grain weight, panicle length, and the number of grains per rice plant. However, the treatment did not give significant results on the clumps number and rice grain weight. Besides improving rice production, straw compost improved the organic-C, total N, and K levels in the soil. Based on this study, rice straw compost brings benefits for paddy cultivation as well as reuses of agricultural waste in a simple way, especially in tropical low-land areas of Indonesia.</p>

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Running title:

**Effect of Straw Compost on Crop Production**

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## Effect of Straw Compost (*Oryza sativa* L.) on Crop Production

### ABSTRACT

Agricultural productivity depends mainly on soil fertility, particularly in intensified-paddy fields. Heavily relying on synthetic agrochemicals in intensified agriculture potentially be changed to regenerative agriculture that utilizes cultivation wastes to achieve sustainable food production. Therefore, this study aims to analyze the effectiveness of rice (*Oryza sativa* L.) straw compost for intensified-rice cultivation. Rice straw compost from the previous planting season was composted on the field (in situ). The composting used "Effective Microorganisms version 4" (EM-4) which contains *Lactobacillus sp.*, *Rhodopseudomonas sp.*, *Actinomyces sp.*, *Streptomyces sp.*, yeast, and cellulose-decomposing fungus. The test field used 4 tons of straw compost and treatments adopted from the local farmers' planting style named Legowo 4:1. Observations on these treatments include the plant nutrients, plant contents, rice components, and yield production. The differences in the results were analyzed using the paired t-test. The results show that the application of straw compost provides a significant increase in dry grain weight, panicle length, and the number of grains per rice plant. However, the treatment did not give significant results on the clumps number and rice grain weight. Besides improving rice production, straw compost improved the organic-C, total N, and K levels in the soil. Based on this study, rice straw compost brings benefits for paddy cultivation as well as reuses of agricultural waste in a simple way, especially in tropical low-land areas of Indonesia.

**Keywords:** agricultural waste, crop productivity, paddy, rice cultivation, sustainability.

## INTRODUCTION

The degradation of farmland poses a significant threat to both biodiversity and soil fertility. Consequently, a shift towards regenerative agricultural practices is needed to counteract this trend. Regenerative agriculture can address global challenges such as limited arable land, greenhouse gas emissions and biodiversity loss (FAO, 2016; Lal, 2020). The main objective of regenerative agriculture is to prevent soil degradation and agroecosystem threats through high-quality as well as non-hazardous soil management practices (El-Ramady et al., 2014; LaCanne & Lundgren; 2018). These methods for improving soil quality can have positive effects on crop yield and resource management efficiency (Ogunwole et al., 2014). Moura et al. (2016) showed that continuous cultivation depends on soil quality, including nutrient content and organic matter.

Intensive cultivation of rice is a growing threat to biodiversity, especially in tropical and sub-tropical regions such as Southeast and East Asia. In Indonesia, lowland rice production is heavily reliant on soil nutrients, which are threatened by erosion, pollution, land conversion and climate change (Wahyunto & Dariah, 2014; Dede et al., 2022a). Consequently, farmers use excessive inorganic fertilizers to maintain soil fertility, leading to new problems such as soil acidity, nutrient imbalances, and low crop yields (Médiène et al., 2011). Unsustainable cultivation practices also result in greenhouse gas emissions and increased production costs (Thiyageshwari et al., 2018). However, sustainable agriculture should prioritize productivity, quality yield, and preservation of resources (Bilali et al., 2018). Rice straw can help maintain soil fertility, but burning it damages soil nutrients and contributes to environmental pollution, also causing the loss of important nutrients, especially N (up to 80%), P (25%), K (21%), Si (4-60%) and soil organic matter (Mandal et al., 2004).

About 73% of paddy fields in Indonesia have low organic content (2%) due to past volcanic eruptions and sedimentation processes (Rahayu et al., 2014; Adviany & Maulana, 2019; Dede et al., 2022b). Straw is an organic material that contains carbon and major nutrients such as N, P, K, Ca, and Mg (Simarmata et al., 2016), but this requires an ideal treatment. Rice straw increases nitrogen fixation when converted into compost containing *Azotobacter* and cellulolysis microorganisms, thereby making the soil healthier and fertile for plant growth (Galsim et al. 2020). Research has shown that combining rice straw with organic fertilizers is more effective than rice ash to improve nutrient levels as well as soil quality for plant development (Watanabe et al., 2017; Lin et al., 2019). Incorporating rice straw and organic fertilizers into intensive rice cultivation practices can be a regenerative solution for tropical and sub-tropical regions.

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3 Different from previous research that referred to the usage of rice straw in soil quality  
4 and health, this study aims to analyze the effectiveness of straw compost (*Oryza sativa* L.) on  
5 crop production. This research was conducted in Karawang, Indonesia which is a well-known  
6 place for national rice production. Currently, rice farmers in Karawang heavily rely on  
7 agrochemicals material, whose input reaches more than 100,000 tons per year for 98,000 Ha  
8 of lands, such as Urea, sulphur-phosphate “SP-36”, ammonium sulfate or *zwavelzure*  
9 *ammoniak* “ZA”, and NPK fertilizers (Sundari & Halim, 2020). Also, large external inputs is  
10 a necessity to produce more than 1 million tonnes of rice per year (Aenunnisa et al., 2022). The  
11 researchers hypothesized that the application of straw compost can improve soil quality that  
12 affects paddy nutrients and productivity. This study addresses a field experiment of straw  
13 compost on lowland paddy varieties (IR-32) for tropical areas.  
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## 24 MATERIALS AND METHODS

### 25 Research Experiment

26 The research was conducted in Rengasdengklok, Karawang Regency, West Java, Indonesia,  
27 for two seasons, covering the cultivation period of dry and rainy. This area has a tropical  
28 monsoon climate with annual rainfall of 1,000-1,500 mm per year (Sukowati & Kusratmoko,  
29 2019; Aruminingsih et al., 2022). According to Nugrahatama & Utami (2021), Rengasdengklok  
30 has an annual average temperature of 27 °C and 85% humidity, thereby making it a fertile-  
31 alluvial region for intensive rice farming in Pantura, Northern Java. This region has large  
32 expanse of Entisols making it ideal for rice cultivation, the detailed characteristics are presented  
33 in Table 1. Materials for this study are rice straw, decomposer organisms named EM-4  
34 (*Laktobacillus sp.*, *Rhodopseudomonas sp.*, *Actinomycetes sp.*, *Streptomyces sp.*, yeast, and  
35 cellulose-decomposing fungus), clean water, inorganic fertilizers, and rice seed (variety IR-  
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46 EM-4 is an “Effective Microorganisms” (EM) Indonesia product widely sold in agricultural  
47 stores. This product is an effective inoculum derived from tropical microorganisms (Syahid et  
48 al., 2020). The decomposer organism needs to be prepared before mixing with rice straw, this  
49 solution becomes an activator. Composting started by making a solution made from EM-4,  
50 molasses, and water (ratio 1:1:1000 ml). Every 1 m<sup>3</sup> of rice straw needs 100-200 liters of  
51 activator solution. The compost is ready for use when rice straw was physically changed to  
52 brown-black color, soft texture and crushed. Additionally, the pile's temperature should be near  
53 the initial conditions of composting, and this process typically takes around one month. A trial  
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was set up in the lowland rice cultivation area with a local cropping culture called "Legowo 4:1", adapted from the farmers in Karya Sari Village. Legowo 4:1 is the rice cultivation practice where every four rows of crops are interspersed by an empty row, this method provides air circulation and sunlight for paddy (Abdulrachman et al., 2013). The paddy field for this research was two plots, with 1,000 m<sup>2</sup> each.

Table 1  
*Characteristics of Entisols at the study site*

Parameter	Value	Information	Acquisition
Soil texture		Silt loam	Hydrometer (Faé et al., 2019)
Sand	3		
Silt	70.7		
Clay	26.3		
pH H <sub>2</sub> O	7.04	Neutral	Potentiometer (Singh et al., 2021)
pH KCl	6.2	Neutral	
C-organik (%)	2.22	Medium	Walkey and Black (Munawaroh et al., 2022)
N-total (%)	0.162	Low	Kjeldahl (Todorova et al., 2011)
K <sub>2</sub> O (mg/100g)	12.4	Low	HClO <sub>4</sub> + HNO <sub>3</sub> (Balai Penelitian Tanah, 2009)
P <sub>2</sub> O <sub>5</sub> (mg/kg)	10.2	Medium	Olsen (Steinfurth et al., 2021)
Cation (cmol/kg):			Conductometric
K	0.1	Low	(Makarychev & Motuzova, 2013)
Na	0.1	Low	
Ca	9.5	Medium	
Mg	3.6	High	
CEC (cmol/kg)	36.1	High	Colorimeter (Matula, 2011)
Alkaline saturation (%)	37.1	Medium	Spectrophotometer (Lin et al., 2021)
Exchangeable aluminum (cmol/kg)	0.01	Low	KCl (Antonangelo et al., 2022)
Exchangeable hydrogen (cmol/kg)	0.4	Low	
Azotobacter (× 10 <sup>6</sup> cfug <sup>-1</sup> )	7.4	Not analyzable	Plate-count (Aasfar et al., 2021)
Azospirillum (× 10 <sup>6</sup> cfug <sup>-1</sup> )	8.3	Not analyzable	

The effect of combining straw with compost was determined by referring to an experimental approach which compares a test field (A) and the control field (B) (Hansson, 2019). This research is based on an experimental approach that intends to analyze the effect of treatments on certain samples with the same characteristics (De Janvry et al., 2017). In the first field A, cultivation of lowland rice applied 4 tons of straw per hectare (Ha) with compost from paddy stubble obtained through the cultivation style adopted by the local farmers in Karawang (Legowo 4:1). However, field B, which is the control only applied the cultivation style of these local farmers. Field A was a regenerative rice farming model that is environmentally friendly

and seeks to reuse the remaining resources, whereas field B was a conventional model that was highly dependent on external inputs.

### Cultivation Stages and Data Analysis

This research started by composting rice straw and stubble from the previous harvest, with the process lasting 1 month before planting time. The composted materials are the major input for rice cultivation in field A. Characteristics of the treatment in field A include land flooding, application of fertilizer (Urea 300 kg/Ha, SP-36 200 kg/Ha), plant spacing of 25 x 25 cm<sup>2</sup>, pests control method adopted from the local farmers, and application of compost the day before planting. However, field B with the control only applied cultivating styles of the local farmers. Also, soil and plant sampling took place during the maximum vegetative phase (fifth-seventh leaf stage), which helps to know the effectiveness of the treatment (Moldenhauer & Slaton, 2001). Sampling of the rice IR-32 was taken on the 55th day after planting with six samples from each group. These samples were obtained through random selection and by transects (crop plots) measuring 1 x 1 m<sup>2</sup> (Riginos et al., 2011; Purnama et al., 2020). Furthermore, the content analysis for soil and plants was carried out in collaboration with university laboratories and the government's agricultural research centers in West Java.

Table 2  
*Parameters of soil and rice observations*

Parameter	Acquisition
Water	Gravimetry (Pasha et al., 2016)
pH	Potentiometer (Singh et al., 2021)
C-organik (%)	Walkey and Black (Munawaroh et al., 2022)
N-total (%)	Kjeldahl (Todorova et al., 2011)
C/N	Ratio (Zhang et al., 2016)
P <sub>2</sub> O <sub>5</sub> (%)	HClO <sub>4</sub> + HNO <sub>3</sub> (Balai Penelitian Tanah, 2009)
K <sub>2</sub> O (%)	
Ash (%)	Wet incineration (Balai Penelitian Tanah, 2009)
Si (%)	
Number of clumps	Count (Longland & Dimitri, 2016)
Straw weight (kg)	Scale (Kumar et al., 2021)
Dry grain weight (g)	
Panicle length (cm)	Tape measure (Bao et al., 2019)
Grains per panicle	Count (Wu et al., 2019)
Weight per 1000 gram	Scale (Thakur et al., 2010)

The response variables in soil and plants (N, P, K, C, Si), water content, and pH were all measured. In addition, the rice yield and plant components from the two fields were measured as shown in Table 2. Data obtained were analyzed using the **paired t-test**, which is a

employed when analyzing the difference in means of the two groups that are correlated (Dede et al., 2022b). Paired t-test is commonly used to analyze the differences and significance in data involving the test and control groups as shown in Equation 1 (Hugar & Savithramma, 2017). Significant differences are shown by the t-value which is greater than the t-table. This is also referred to as the p-value with a 95% confidence level.

$$t = \frac{D}{SD/\sqrt{N}} \quad (1)$$

where t is the t-count value, D is the average measured value for groups 1 and 2, SD indicates the standard deviation, and N represents the number of samples.

## RESULT AND DISCUSSION

### Soil Characteristics and Paddy Nutrients

The results showed that the field with the compost treatment were beneficial to both the plants and the soil. The increase observed in the nutrient levels are as follow: C-organic (5.69%), total N (16.67%), P (7.53%), and K (42.34%). Statistically, it was shown that there was a significant increase in nutrient levels, although there was an exception for P, as shown in Table 3. Descriptively, the increase in P levels was higher compared with the C-organic in the soil. This is due to the fact that the C-organic at the study site was at moderate levels, different from P which was previously low. The P content was indeed the lowest compared with other nutrients, as observed in Table 4. Almohammed et al. (2014) and Rakotoson et al., (2021) argued that the insignificant P increased in the soil after using straw compost is an indication that the the presence of this nutrient depends on inorganic fertilizers and naturally occurring phosphate compounds excreted as wastes by bats (guano). Also, significant increasing C-organic, N, and K levels have previously been partially investigated by scientists. Based on the study of Li et al., (2019), increasing C-organic is caused by the ability of microorganisms to break down carbon compounds, which easily blend with the soil. However, Moe et al. (2019) showed that the application of 50% fertilizer mixed with compost contained less than 4% of N, showing a similar effect to the conventional cultivation which is fully dependent on inorganic fertilizers. Consequently, the use of straw-based compost should be encouraged for optimal doses of this nutrient, while also reducing the farmers' dependence on inorganic fertilizers.



Table 3  
*Differences in nutrient content of the soil*

Parameter	Treatment	Mean	SD	t-value	p-value
C-organic (%)	A	2.97	0.11	-2.726	0.02
	B	2.81	0.09		
N-total (%)	A	0.28	0.02	-3.413	0.01
	B	0.24	0.02		
P (ppm)	A	2.57	0.15	-2.208	0.05
	B	2.39	0.15		
K (ppm)	A	104.25	17.44	-3.826	0.00
	B	73.24	9.49		

Table 4  
*Content of rice straw compost*

Parameter	Value	Parameter	Value
Water	60	P <sub>2</sub> O <sub>5</sub> (%)	0.17
pH	7.25	K <sub>2</sub> O (%)	0.6
C-organic (%)	15.24	CaO (%)	5.52
N-total (%)	0.75	MgO (%)	1.25
C/N	20.32	CEC (cmol/kg)	19.08

Table 5  
*Differences in straw weight and rice nutrients*

Parameter	Treatment	Mean	SD	t-value	p-value
Dry grain weight (g)	A	89.91	12.92	-2.84	0.02
	B	62.97	19.34		
C-organic (%)	A	51.63	9.79	-3.21	0.01
	B	38.78	0.71		
Ash (%)	A	16.12	0.8	1.35	0.21
	B	16.9	1.16		
Si (%)	A	11.08	0.93	-0.88	0.4
	B	10.63	0.83		
N (%)	A	1.33	0.14	-3.81	0
	B	1.08	0.08		
P (%)	A	0.23	0.01	1.61	0.14
	B	0.24	0.02		
K (%)	A	1.76	0.12	-2.39	0.04
	B	1.63	0.06		

Furthermore, the increasing nutrients in the soil after applying straw compost are well-absorbed by rice plants. This is evident from the rice yield and the nutrient in the crops such as C-organic, N-total, K, and Si. According to Table 5, the weight of the dry straw in field A increased by 29.96% compared with the conventional method and there was an increase in the nutrient content of the plants. However, this treatment did not increase the ash and P content of the rice, while the conventional cultivation in the control field resulted in higher values for both components, respectively 4.84% and 4.35%. Statistically, the increase in nutrients for Si



is not significant. Basically, this compost treatment showed increasing C-organic, N-total, and K, with no effect on ash, P, and Si contents. Ash and Si are components associated with each other and useful for stemming pest attacks, plant resistance to diseases, and producing agroecosystems restoring enzymes (Ratnayake et al., 2018; Karam et al., 2022; Mahmud-Toher et al., 2022). The ash and Si levels were not significant in plants due to the high pH of the soil, thereby preventing the well-absorption of these substances by the roots. Increasing C-organic, N, and K should be compatible with P in crop, as shown in Figure 1. Zhao et al. (2016) found that organic matter and essential nutrients contribute positively to the productivity of agricultural land, because plants grow optimally. Hence, it is observed that there is need for the supply of P from inorganic fertilizers while reprocessing straw compost are needed for the compounds making up the plant nutrients.

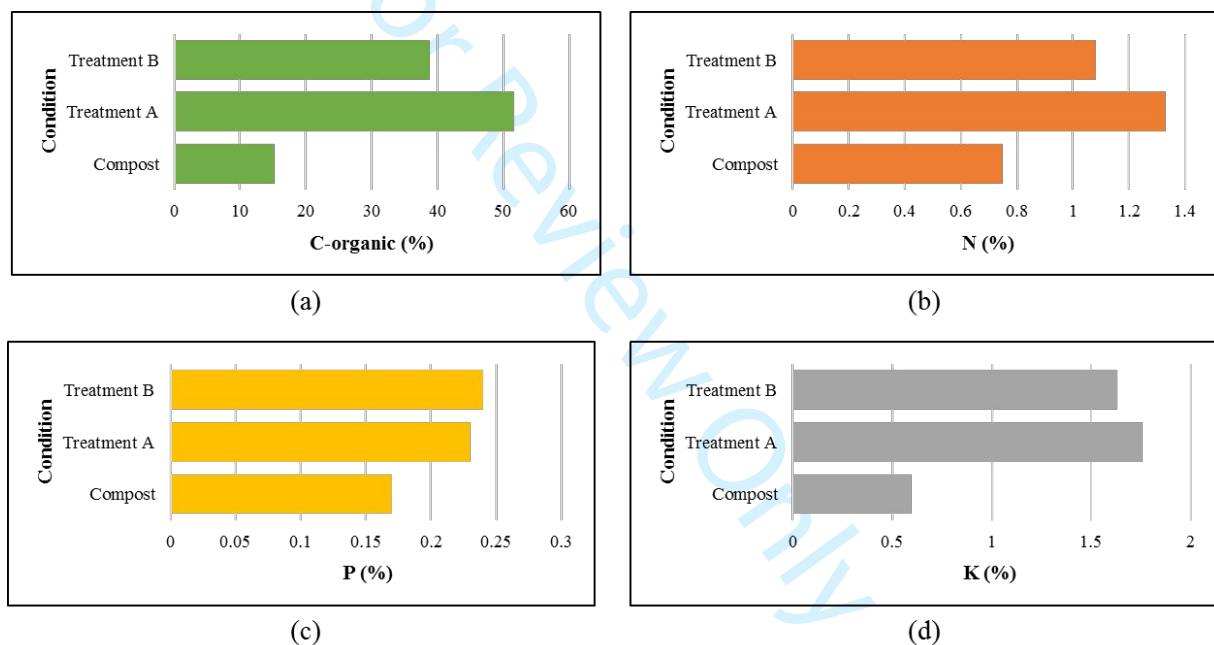


Figure 1. Comparison of various nutrient content in compost and its absorption in rice plant. The application of straw compost increased c-organic (a), nitrogen (b) and potassium (d) levels, but not in phosphorus (c).

### Paddy Yield and Its Components

The application of straw compost significantly increased the number of clumps and dry grain weight in rice. It also increased the grains per panicle, panicle size, and grain weight as shown in Table 6. Also, the significant increase, with a p-value of less than 0.05, was seen in dry grain weight, panicle length, and grains per panicle. Furthermore, the treatment did not have any effect on straw weight due to the same value obtained from the two fields. This shows the effectiveness of the application of straw compost together with the conventional cultivation

style by the local farmers, as the dry grain weight increased by 10.95%. These results are in line with research conducted by Xie et al. (2015), which showed the effectiveness of compost on soil organic matter content and rice production up to 7.1-12.1%. Additionally, the increase in dry grain weight is an indication of abundance of grains per panicle. Applying straw compost raised the number of grains in each panicle by almost 10%, showing that the abundance of rice grains does not reduce its quality. The combination of compost, proper treatment, and right timing for harvest are the keys to improved rice production (Ho et al., 2022).

Table 6  
*Plant components and rice productivity after treatments*

Parameter	Treatment	Mean	SD	t-value	p-value	Difference (%)
Number of clumps	A	32	3.56	-1.69	0.12	6.67
	B	28	4.59			
Straw weight (kg)	A	2.58	0.26	0.00	1.00	0.00
	B	2.58	0.45			
Dry grain weight (g)	A	1274.17	122.56	-2.53	0.03	10.95
	B	1022.67	210.47			
Panicle length (cm)	A	23.3	0.67	-2.59	0.03	3.88
	B	21.56	1.5			
Grains per panicle	A	163	13	-2.70	0.02	9.76
	B	134	23			
Weight per 1000 gran	A	30	0	-1.58	0.14	2.86
	B	28.33	2.58			

The presence of straw compost triggered the proper growth of the rice components such as the clumps, panicle length, and grain. This treatment is beneficial to the farmers because it can reduce costs for agrochemical fertilizers, since it has proven to produce higher quality rice plants compared with the conventional cultivation method. In tropical regions, rice straw compost is good in increasing the growth and productivity of crops. Its application also improved the soil health for rice cultivation. Straw compost helps to solve the problems of low organic matter, considering the fact that the c-organic in the soils are low to moderate (80.1%) during rice cultivating in Karawang (Balai Penelitian Tanah, 2010). Also, treatment with straw compost during rice cultivation increased soil organic matter and reduced leaching of soil nutrients (Lenin et al., 2021). Straw compost improved absorption of essential nutrients for rice plants thereby increasing the cation exchange coefficient (CEC) in the soil (Li et al., 2014).

This positive result shows that the success of restoring paddy fields is vital in food security and self-sufficiency. There is need for general coordination from the government, academics, researchers and agricultural activists on the proper use of straw compost during rice

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3 cultivation, thus improving the farmers' welfare. In addition, the utilization of harvested straw  
4 as compost is a good means of eradicating the burning of agricultural wastes, which releases  
5 greenhouse gases into the atmosphere. Regenerative farming activities are easier to achieve,  
6 considering the fact that the life-cycle of rice plants produces zero or less wastes, as all its parts,  
7 except for rice grain and bran, are useful on the fields as input for the next cultivation process.  
8 Furthermore, rice is one of the major cereals humans depend on for carbohydrates, hence, the  
9 sustainability of its cultivation needs serious attention from all stakeholders. Conclusively, the  
10 use of straw compost during rice cultivation is more environmentally friendly and is in line  
11 with sustainable principles.  
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## 20 **CONCLUSSION**

21 The application of straw compost during intensive rice cultivation has shown to increase both  
22 the soil and plant nutrients. It also improved the rice growth and its productivity, compared  
23 with the conventional cultivation practices using agrochemicals. The use of straw in the  
24 previous planting season is more profitable to the farmers than burning it to ashes. Specifically,  
25 it increased the C-organic, N, and K contents of the soil and the rice plants. The rice plants had  
26 a better growth as seen from its number of clumps, panicle length, and weight per panicle.  
27 Additionally, this treatment during rice planting resulted in higher dry grain and grain weight  
28 compared with the conventional methods used by local farmers. Furthermore, it helps in  
29 solving problems to tackle agricultural waste, more environmentally friendly, prevents high  
30 emission greenhouse gases into the atmosphere, and a major means of implementing  
31 regenerative agriculture for intensive rice planting. These results can be a reference for wider  
32 trials through the development of large-scale research in rice cultivation. However, it requires  
33 further studies to know the effects of straw compost when applied to a wider area and varying  
34 elevation, different soil, rice varieties, and climates in tropical to sub-tropical environments,  
35 especially in low-land areas. Research on carbon sequestration in soils in the future can support  
36 the impact of utilizing straw compost at a certain time.  
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50  
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57  
58  
59  
60  
**REFERENCES**

- Aasfar, A., Bargaz, A., Yaakoubi, K., Hilali, A., Bennis, I., Zeroual, Y., & Meftah Kadmiri, I. (2021). Nitrogen fixing Azotobacter species as potential soil biological enhancers for crop nutrition and yield stability. *Frontiers in Microbiology*, 12, 628379. <https://doi.org/10.3389/fmicb.2021.628379>
- Abdulrachman, S., Agustiani, N., Gunawan, I., & Mejaya, M. J. (2013). *Sistem tanam Legowo* [Legowo cropping system]. Kementerian Pertanian Republik Indonesia.
- Adviany, I., & Maulana, D. D. (2019). Pengaruh pupuk organik dan jarak tanam terhadap C-organik, populasi jamur tanah dan bobot kering akar serta hasil padi sawah pada inceptisols Jatinangor, Sumedang [The effect of organic fertilizer and plant spacing on C-organic, soil fungal population, root dry weight and yield of lowland rice in inceptisols Jatinangor, Sumedang]. *Agrotechnology Research Journal*, 3(1), 28-35. <https://doi.org/10.20961/agrotechresj.v3i1.30382>
- Aenunnisa, N., Hasan, Z., & Ayomi, N. M. S. (2022). The economic efficiency of rice farming production factors in Karawang region. *Agro Ekonomi*, 33(1), 60-72. <https://doi.org/10.22146/ae.66704>
- Almohammed, A. N., Almehemdi, A. F., & Al Ajeelee, R. K. (2014). Impact of bat guano *Otonycteris hemprichii* camd and seaweed extract on some growth and yield traits of barakaseed *Nigella sativa* L. *Journal of Biology, Agriculture and Healthcare*, 4(1): 57-65.
- Antonangelo, J. A., Neto, J. F., Crusciol, C. A. C., Zhang, H., Alleoni, L. R. F., & Kinrade, S. D. (2022). Comparative analysis of exchangeable aluminum in a tropical soil under long-term no-till cultivation. *Soil and Tillage Research*, 216, 105242. <https://doi.org/10.1016/j.still.2021.105242>
- Aruminingsih, A., Martono, D. N., Soesilo, T. E. B., & Tambunan, R. P. (2022). Flood disaster risk model in Karawang Regency's industrial area, West Java Province, Indonesia. *Indonesian Journal of Geography*, 54(1), 70-82. <https://doi.org/10.22146/ijg.69027>
- Balai Penelitian Tanah. (2009). *Petunjuk teknis analisis kimia tanah, tanaman, air, dan pupuk* [Technical guidelines for chemical analysis of soil, crops, water, and fertilizers]. Kementerian Pertanian Republik Indonesia.
- Balai Penelitian Tanah. (2010). *Delineasi kandungan bahan organik tanah pada lahan sawah intensif di Pulau Jawa (studi kasus di Kabupaten Karawang)* [Delineation of soil organic

- matter content in paddy-intensified fields in Java Island (a case study in Karawang Regency)]. Kementerian Pertanian Republik Indonesia.
- Bao, Y., Tang, L., Breitzman, M. W., Salas Fernandez, M. G., & Schnable, P. S. (2019). Field-based robotic phenotyping of sorghum plant architecture using stereo vision. *Journal of Field Robotics*, 36(2), 397-415. <https://doi.org/10.1002/rob.21830>
- Bilali, H. E., Callenius, C., Strassner, C., & Probst, L. (2018). Food and nutrition security and sustainability transitions in food systems. *Food and Energy Security*, 8(2), e00154. <https://doi.org/10.1002/fes3.154>
- De Janvry, A., Sadoulet, E., & Suri, T. (2017). Field experiments in developing country agriculture. In *Handbook of economic field experiments* (Vol. 2, pp. 427-466). North-Holland. <https://doi.org/10.1016/bs.hefe.2016.08.002>
- Dede, M., Asdak, C., & Setiawan, I. (2022a). Spatial-ecological approach in Cirebon's peri-urban regionalization. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1089, No. 1, p. 012080). IOP Publishing. <https://doi.org/10.1088/1755-1315/1089/1/012080>
- Dede, M., Wibowo, S. B., Prasetyo, Y., Nurani, I. W., Setyowati, P. B., & Sunardi, S. (2022b). Water resources carrying capacity before and after volcanic eruption. *Journal of Environmental Science and Management*, 8(4), 473-484. <https://doi.org/10.22034/GJESM.2022.04.02>
- El-Ramady, H. R., Alshaal, T. A., Amer, M., Domokos-Szabolcsy, E., Elhawat, N., Prokisch, J., & Fari, M. (2014). Soil quality and plant nutrition. In H. Ozier-Lafontaine, & M. Lesueur-Jannoyers (Eds.), *Sustainable agriculture reviews 14: Agroecology and global change* (pp. 345-447) Springer International Publishing.
- Faé, G. S., Montes, F., Bazilevskaya, E., Añó, R. M., & Kemanian, A. R. (2019). Making soil particle size analysis by laser diffraction compatible with standard soil texture determination methods. *Soil Science Society of America Journal*, 83(4), 1244-1252. <https://doi.org/10.2136/sssaj2018.10.0385>
- FAO. (2016). Sustainable value chains for sustainable food systems. In *Workshop of the FAO/UNEP program on sustainable food systems*. UN Food and Agricultural Organization.
- Galsim, F., Golabi, M. H., Kim, Y. S., & Iyekar, C. (2021). Comparative effects of composted organic waste and inorganic fertilizer on nitrate leachate from the farm soils of northern Guam. *International Soil and Water Conservation Research*, 9(1), 87-102. <https://doi.org/10.1016/j.iswcr.2020.09.003>

- 1  
2  
3 Hansson, S. O. (2019). Farmers' experiments and scientific methodology. *European Journal*  
4 *for Philosophy of Science*, 9(3), 1-23. <https://doi.org/10.1007/s13194-019-0255-7>  
5  
6 Ho, T. T. K., Le, T. H., Tran, C. S., Nguyen, P. T., Thai, V. N., & Bui, X. T. (2022). Compost  
7 to improve sustainable soil cultivation and crop productivity. *Case Studies in Chemical*  
8 *and Environmental Engineering*, 6, 100211. <https://doi.org/10.1016/j.cscee.2022.100211>  
9  
10 Hugar, A., & Savithramma, D. L. (2017). Testing the significance for difference in mean  
11 performance for growth, yield and WUE linked traits using t-test in F7 and F8 RILs of  
12 groundnut (*Arachis hypogaea* L.). *Journal of Pharmacognosy and Phytochemistry*, 6(5),  
13 2710-2713.  
14  
15 Karam, D. S., Nagabovanalli, P., Rajoo, K. S., Ishak, C. F., Abdu, A., Rosli, Z., Muharam, F.  
16 M., & Zulperi, D. (2022). An overview on the preparation of rice husk biochar, factors  
17 affecting its properties, and its agriculture application. *Journal of the Saudi Society of*  
18 *Agricultural Sciences*, 21(3), 149-159. <https://doi.org/10.1016/j.jssas.2021.07.005>  
19  
20 Kumar, A., Chauhan, A. S., Bains, R., & Das, P. (2021). Rice straw (*Oryza sativa* L.) biomass  
21 conversion to furfural, 5-hydroxymethylfurfural, lignin and bio-char: A comprehensive  
22 solution. *Journal of Industrial and Engineering Chemistry*, 104, 286-294.  
23 <https://doi.org/10.1007/s11258-016-0665-y>  
24  
25 LaCanne, C. E., & Lundgren, J. G. (2018). Regenerative agriculture: Merging farming and  
26 natural resource conservation profitably. *PeerJ*, 6, e4428.  
27 <https://doi.org/10.7717/peerj.4428>  
28  
29 Lal, R. (2020). Regenerative agriculture for food and climate. *Journal of Soil and Water*  
30 *Conservation*, 75(5), 123A-124A. <https://doi.org/10.2489/jswc.2020.0620A>  
31  
32 Lenin, I., Siska, W., & Mirnia, E. (2021). The effect of straw compost on nutrient uptake and  
33 yield of rice in newly opened and intensive lowland. In *E3S Web of Conferences* (Vol.  
34 306, p. 01032). EDP Sciences. <https://doi.org/10.1051/e3sconf/202130601032>  
35  
36 Li, J., Lu, J., Li, X., Ren, T., Cong, R., & Zhou, L. (2014). Dynamics of potassium release and  
37 adsorption on rice straw residue. *PLoS One*, 9(2), e90440.  
38 <https://doi.org/10.1371/journal.pone.0090440>  
39  
40 Li, T., Gao, J., Bai, L., Wang, Y., Huang, J., Kumar, M., & Zeng, X. (2019). Influence of green  
41 manure and rice straw management on soil organic carbon, enzyme activities, and rice  
42 yield in red paddy soil. *Soil and Tillage Research*, 195, 104428.  
43 <https://doi.org/10.1016/j.still.2019.104428>  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60



- 1  
2  
3 Lin, W., Lin, M., Zhou, H., Wu, H., Li, Z., & Lin, W. (2019). The effects of chemical and  
4 organic fertilizer usage on rhizosphere soil in tea orchards. *PloS One*, *14*(5), e0217018.  
5 <https://doi.org/10.1371/journal.pone.0217018>  
6  
7  
8 Lin, X., Zhang, J., Chen, H., & Han, L. (2021, May). Determination of available phosphorus  
9 in alkaline soil by molybdenum blue spectrophotometry. In *IOP Conference Series:  
10 Earth and Environmental Science* (Vol. 781, No. 5, p. 052003). IOP Publishing.  
11 <https://doi.org/10.1088/1755-1315/781/5/052003>  
12  
13  
14 Longland, W. S., & Dimitri, L. A. (2016). Can seed caching enhance seedling survival of Indian  
15 ricegrass (*Achnatherum hymenoides*) through intraspecific facilitation?. *Plant Ecology*,  
16 *217*, 1523-1532.  
17  
18  
19  
20  
21 Mahmud-Toher, A. S., Govender, N., Dorairaj, D., & Wong, M. Y. (2022). Effects of silica  
22 soil amendment against *Exserohilum rostratum*, the fungal pathogen of rice brown spot  
23 disease in Peninsular Malaysia. *Scientific Reports*, *12*(1), 15690.  
24 <https://doi.org/10.1038/s41598-022-19308-z>  
25  
26  
27  
28 Makarychev, I. P., & Motuzova, G. V. (2013). Complexation between metal ions and water  
29 soluble organic soil substances as analyzed by electrochemical techniques. *Moscow  
30 University Soil Science Bulletin*, *68*, 41-47. <https://doi.org/10.3103/S0147687413010055>  
31  
32  
33 Mandal, K. G., Misra, A. K., Hati, K. M., Bandyopadhyay, K. K., Ghosh, P. K., & Mohanty,  
34 M. (2004). Rice residue-management options and effects on soil properties and crop  
35 productivity. *Journal of Food Agriculture and Environment*, *2*, 224-231.  
36  
37  
38 Matula, J. (2011). Determination of dissolved reactive and dissolved total phosphorus in water  
39 extract of soils. *Plant, Soil and Environment*, *57*(1), 1-6.  
40 <https://doi.org/10.17221/185/2010-PSE>  
41  
42  
43 Médiène, S., Valantin-Morison, M., Sarthou, J.P., De Tourdonnet, S., Gosme, M., Bertrand,  
44 M., Roger-Estrade, J., Aubertot, J.N., Rusch, A., Motisi, N., & Doré, T. (2011).  
45 Agroecosystem management and biotic interactions: A review. *Agronomy for  
46 Sustainable Development*, *31*, 491-514. <https://doi.org/10.1007/s13593-011-0009-1>  
47  
48  
49  
50 Moe, K., Moh, S. M., Htwe, A. Z., Kajihara, Y., & Yamakawa, T. (2019). Effects of integrated  
51 organic and inorganic fertilizers on yield and growth parameters of rice varieties. *Rice  
52 Science*, *26*(5), 309-318. <https://doi.org/10.1016/j.rsci.2019.08.005>  
53  
54  
55 Moldenhauer, K. E. W. C., & Slaton, N. (2001). Rice growth and development. In *Arkansas  
56 rice production handbook* (Vol. 192, pp. 9-20). University of Arkansas.  
57  
58  
59 Moura, E. G. D., Gehring, C., Braun, H., Ferraz Junior, A. D. S. L., Reis, F. D. O., & Aguiar,  
60 A. D. C. F. (2016). Improving farming practices for sustainable soil use in the humid

- 1  
2  
3 tropics and rainforest ecosystem health. *Sustainability*, 8(9), 841.  
4  
5 <https://doi.org/10.3390/su8090841>  
6  
7 Munawaroh, H., Rauf, A., & Sabrina, T. (2022, May). Preliminary study on C-organic and C-  
8 microbial biomass of peatland in Toba highlands. In *IOP Conference Series: Earth and*  
9 *Environmental Science* (Vol. 1025, No. 1, p. 012017). IOP Publishing. [https://doi.org/](https://doi.org/10.1088/1755-1315/1025/1/012017)  
10 [10.1088/1755-1315/1025/1/012017](https://doi.org/10.1088/1755-1315/1025/1/012017)  
11  
12  
13 Nugrahatama, D., & Utami, F. N. H. (2021). The landscape design of Karawang Islamic center  
14 based on Islamic garden. In *IOP Conference Series: Earth and Environmental Science*  
15 (Vol. 879, No. 1, p. 012011). IOP Publishing. [https://doi.org/10.1088/1755-](https://doi.org/10.1088/1755-1315/879/1/012011)  
16 [1315/879/1/012011](https://doi.org/10.1088/1755-1315/879/1/012011)  
17  
18  
19  
20 Ogunwole, J. O., Sharma, B. R., McCartney, M. P., Zemadim, B., & Leta, G. (2014). Land use  
21 impact on soil physical quality and soil structure in three watersheds of Ethiopia.  
22 *Advances in Plants & Agriculture Research*, 1(4), 1-9.  
23 <https://doi.org/10.15406/apar.2014.01.00019>  
24  
25  
26  
27 Pasha, A. Y., Khoshghalb, A., & Khalili, N. (2016). Pitfalls in interpretation of gravimetric  
28 water content-based soil-water characteristic curve for deformable porous media.  
29 *International Journal of Geomechanics*, 16(6), D4015004.  
30 [https://doi.org/10.1061/\(ASCE\)GM.1943-5622.0000570](https://doi.org/10.1061/(ASCE)GM.1943-5622.0000570)  
31  
32  
33  
34 Purnama, M. F., Sari, S. F., & Admaja, A. K. (2020). Spatial distribution of invasive alien  
35 species *Tarebia granifera* in Southeast Sulawesi, Indonesia. *AACL Bioflux*, 13(3), 1355-  
36 1365.  
37  
38  
39  
40 Rahayu, A., Utami, S. R., & Rayes, M. L. (2014). Karakteristik dan klasifikasi tanah pada lahan  
41 kering dan lahan yang disawahkan di Kecamatan Perak Kabupaten Jombang  
42 [Characteristics and classification of soil on dry land and rice fields in Perak District,  
43 Jombang Regency]. *Jurnal Tanah dan Sumberdaya Lahan*, 1(2), 79-87.  
44  
45  
46  
47 Rakotoson, T., Rinasoa, S., Andriantsiorimanana, A., Razafimanantsoa, M. P., Razafimbelo,  
48 T., Rabeharisoa, L., Tsujimoto, Y., & Wissuwa, M. (2021). Effects of fertilizer micro-  
49 dosing in nursery on rice productivity in Madagascar. *Plant Production Science*, 24(2),  
50 170-179. <https://doi.org/10.1080/1343943X.2020.1828947>  
51  
52  
53  
54 Ratnayake, R. M. R. N. K., Ganehenege, M., Ariyaratne, H., & Daundasekera, W. (2018).  
55 Soil application of rice husk as a natural silicon source to enhance some chemical defense  
56 responses against foliar fungal pathogens and growth performance of Bitter Gourd  
57 (*Momordica charantia* L.). *Ceylon Journal of Science*, 47(1), 49-55.  
58 <https://doi.org/10.4038/cjs.v47i1.7486>  
59  
60



- 1  
2  
3 Riginos, C., Herrick, J. E., Sundaresan, S. R., Farley, C., & Belnap, J. (2011). A simple  
4 graphical approach to quantitative monitoring of rangelands. *Rangelands*, 33(4), 6-13.  
5 <https://doi.org/10.2111/1551-501X-33.4.6>  
6  
7  
8 Simarmata, T., Turmuktini, T., Fitriatin, B. N., & Setiawati, M. R. (2016). Application of  
9 bioameliorant and biofertilizers to increase the soil health and rice productivity. *Hayati*  
10 *Journal of Biosciences*, 23(4), 181-184. <https://doi.org/10.1016/j.hjb.2017.01.001>  
11  
12 Singh, M., Patkar, R., Vinchurkar, M., & Baghini, M. S. (2021). Voltammetry based handheld  
13 measurement system for soil pH. *Journal of Electroanalytical Chemistry*, 885, 115086.  
14 <https://doi.org/10.1016/j.jelechem.2021.115086>  
15  
16  
17 Steinfurth, K., Hirte, J., Morel, C., & Buczko, U. (2021). Conversion equations between Olsen-  
18 P and other methods used to assess plant available soil phosphorus in Europe—A review.  
19 *Geoderma*, 401, 115339. <https://doi.org/10.1016/j.geoderma.2021.115339>  
20  
21  
22 Sukowati, K. A. D., & Kusratmoko, E. (2019). Analysis of the distribution of flood area in  
23 Karawang Regency using SAR Sentinel 1A image. In *IOP Conference Series: Earth and*  
24 *Environmental Science* (Vol. 311, No. 1, p. 012085). IOP Publishing.  
25 <https://doi.org/10.1088/1755-1315/311/1/012085>  
26  
27  
28 Sundari, S., & Halim, S. (2020). Analysis of fertilizer subsidy policy in supporting food  
29 security in Karawang District, West Java Province policy 2013-2017. In *1st Borobudur*  
30 *International Symposium on Humanities, Economics and Social Sciences* (pp. 810-815).  
31 Atlantis Press. <https://doi.org/10.2991/assehr.k.200529.171>  
32  
33  
34 Syahid, A., Prasetya, B., & Aini, L. Q. (2020). Physical and chemical characteristics during  
35 composting on different types of compost materials. *EurAsian Journal of BioSciences*,  
36 14(2), 7921-7928.  
37  
38  
39 Thakur, A. K., Rath, S., Roychowdhury, S., & Uphoff, N. (2010). Comparative performance  
40 of rice with system of rice intensification (SRI) and conventional management using  
41 different plant spacings. *Journal of Agronomy and Crop Science*, 196(2), 146-159.  
42 <https://doi.org/10.1111/j.1439-037X.2009.00406.x>  
43  
44  
45  
46  
47  
48  
49 Thiyageshwari, S., Gayathri, P., Krishnamoorthy, R., Anandham, R., & Paul, D. (2018).  
50 Exploration of rice husk compost as an alternate organic manure to enhance the  
51 productivity of blackgram in typic haplustalf and typic rhodustalf. *International Journal*  
52 *of Environmental Research and Public Health*, 15(2), 358.  
53 <https://doi.org/10.3390/ijerph15020358>  
54  
55  
56  
57  
58  
59  
60

- 1  
2  
3 Todorova, M., Atanassova, S., Lange, H., & Pavlov, D. (2011). Estimation of total N, total P,  
4 pH and electrical conductivity in soil by near-infrared reflectance spectroscopy.  
5 *Agricultural Science and Technology*, 3(1), 50-54.  
6  
7  
8 Wahyunto, W., & Dariah, A. (2014). Degradasi lahan di Indonesia: Kondisi existing,  
9 karakteristik, dan penyeragaman definisi mendukung gerakan menuju satu peta [Land  
10 degradation in Indonesia: Existing conditions, characteristics and uniform definitions  
11 support the movement toward one map]. *Jurnal Sumberdaya Lahan*, 8(2), 81-93.  
12  
13  
14 Watanabe, T., Luu, H. M., & Inubushi, K. (2017). Effects of the continuous application of rice  
15 straw compost and chemical fertilizer on soil carbon and available silicon under a double  
16 rice cropping system in the Mekong Delta, Vietnam. *Japan Agricultural Research*  
17 *Quarterly: JARQ*, 51(3), 233-239. <https://doi.org/10.6090/jarq.51.233>  
18  
19  
20  
21  
22 Wu, W., Liu, T., Zhou, P., Yang, T., Li, C., Zhong, X., Sun, C., Liu, S., & Guo, W. (2019).  
23 Image analysis-based recognition and quantification of grain number per panicle in rice.  
24 *Plant Methods*, 15, 1-14. <https://doi.org/10.1186/s13007-019-0510-0>  
25  
26  
27  
28 Xie, K., Xu, P., Yang, S., Lu, Y., Jiang, R., Gu, W., Li, W., & Sun, L. (2015). Effects of  
29 supplementary composts on microbial communities and rice productivity in cold water  
30 paddy fields. *Journal of Microbiology and Biotechnology*, 25(5), 569-578.  
31 <https://doi.org/10.4014/jmb.1407.07066>  
32  
33  
34  
35 Zhang, S., Yan, L., Huang, J., Mu, L., Huang, Y., Zhang, X., & Sun, Y. (2016). Spatial  
36 heterogeneity of soil C: N ratio in a Mollisol watershed of Northeast China. *Land*  
37 *Degradation & Development*, 27(2), 295-304. <https://doi.org/10.1002/ldr.2427>  
38  
39  
40  
41 Zhao, Y. N., He, X. H., Huang, X. C., Zhang, Y. Q., & Shi, X. J. (2016). Increasing soil organic  
42 matter enhances inherent soil productivity while offsetting fertilization effect under a rice  
43 cropping system. *Sustainability*, 8(9), 879. <https://doi.org/10.3390/su8090879>  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
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