



# CERTIFICATE OF PARTICIPATION

THE 3<sup>rd</sup> ICSARD 2022  
International Conference  
on Sustainable Agriculture  
for Rural Development



CERTIFICATE No. 39/UN23.5/DL.17/2022

This certificate is awarded to:


**Susanto Budi Sulisty, Ph.D.**

in acknowledgement of participation as  
**an Oral Presenter**  
with title

Non-Destructive Estimation of Total Sugar and Moisture Content of Granulated Coconut Sugar Using a Vis-NIR Spectral Sensor

at the 3rd International Conference on Sustainable Agriculture for Rural Development  
held on August 23, 2022 at Jenderal Soedirman University, Indonesia

Dean of  
Faculty of Agriculture

  
Dr. Ir. Anisur Rosyad, M.S.



Chairman of  
the 3rd ICSARD 2022

Arief Sudarmaji, S.T., M.T., Ph.D.



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FACULTY OF AGRICULTURE  
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**Organizing Committee**  
**The 3<sup>rd</sup> International Conference on Sustainable Agriculture for**  
**Rural Development 2022 (3<sup>rd</sup> ICSARD 2022)**  
**Faculty of Agriculture Jenderal Soedirman University**  
**Jl. Dr. Soeparno, Karangwangkal, Purwokerto, Indonesia 53123**  
**Email: [icsard@unsoed.ac.id](mailto:icsard@unsoed.ac.id)**



## LETTER OF ACCEPTANCE

August 20, 2022

**Dear,**

**Susanto B. Sulisty, Arief Sudarmaji, Pepita Haryanti, Purwoko H. Kuncoro**

The organizing committee of the 3<sup>rd</sup> International Conference on Sustainable Agriculture for Rural Development (the 3<sup>rd</sup> ICSARD) 2022 is pleased to inform you that the submitted abstract:

ID number : 3100

Title : Non-Destructive Estimation of Total Sugar and Moisture Content of Granulated Coconut Sugar using a Vis-NIR Spectral Sensor

has been accepted for **Oral Presentation** based on the peer-review by the scientific committee of the 3<sup>rd</sup> ICSARD, which will be held virtually on August 23, 2022. The abstract will be appeared in the book of program and will be available for all participants of the conference. We thank for your contribution in the 3<sup>rd</sup> ICSARD 2022 and look forward to your participation in this event.

Best regards,



Arief Sudarmaji, PhD.

Chairman of the 3<sup>rd</sup> ICSARD 2022 Committee



# PROGRAM BOOK

## THE 3<sup>rd</sup> ICSARD 2022

International Conference  
on Sustainable Agriculture for Rural Development

“STRENGTHENING SUSTAINABLE AGRICULTURE IN  
THE NEW NORMAL AND DISRUPTIVE TECHNOLOGY ERA”

PURWOKERTO - INDONESIA - AUGUST 23, 2022



# Organizer

**The 3<sup>rd</sup> International Conference on Sustainable Agriculture for Rural Development 2022 is organized by the Faculty of Agriculture, Jenderal Soedirman University**

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## MEETING SCHEDULE OF THE 3<sup>rd</sup> ICSARD 2022 AUGUST 23, 2022

Link Zoom:

<https://bit.ly/Zoom-ICSARD2022>

Meeting ID: 898 5084 1370

Passcode: ICSARD

| Time*       | Session   | Platform |
|-------------|---|----------|
| 07:30-08:00 | Participants enter the meeting room   | Zoom     |
| 08:00-08:30 | <b>Opening Ceremony</b><br>1. National Anthem "Indonesia Raya"<br>2. Prayer<br>3. Report by Chairman<br>4. Opening Remarks by Dean of Faculty of Agriculture, Jenderal Soedirman University<br>5. Photo Session<br>Master of Ceremony: Dr. Ervina | Zoom     |
| 08:30-12:00 | <b>Plenary Session</b><br>Moderator: Dr. Prita Sari Dewi  | Zoom     |
| 08:30-09:15 | <b>Keynote Speaker:</b><br><b>Dr. Ir. Kasdi Subagyo, M.Sc</b> (Secretary General of the Ministry of Agriculture, Republic of Indonesia)   |          |
|             | <b>Invited Speakers:</b>  |          |
| 09:15-10:15 | 1. Prof. Indrawati Oey, Ph.D (Otago University, New Zealand)  |          |
| 10:15-11:15 | 2. Krissandi Wijaya, Ph.D. (Jenderal Soedirman University, Indonesia)   |          |
| 11:15-12:15 | 3. Prof. Yukio Ozaki, Ph.D. (Kyushu University, Japan)  |          |
| 12:15-13:00 | <b>Break</b>  |          |
| 13:00-13:15 | Participants enter the break out room   | Zoom     |
| 13:15-17:15 | <b>Parallel Session (See detail parallel section)</b>   | Zoom     |
| 17:15-17:30 | <b>Closing Ceremony</b><br>Closing Remarks by Dean of Faculty of Agriculture Jenderal Soedirman University  | Zoom     |

\* All times shown are based on the local time of the conference location (Jakarta time, GMT+7)

## PARALLEL SESSION (ROOM 5)

| Moderator |                     | Budi Dharmawan, Ph.D. |  |   |                                     |
|-----------|---------------------|-----------------------|--|---|-------------------------------------|
| No        | Time                | Paper ID              | Title  | Authors   | Affiliation                         |
| 1         | 13.15<br>-<br>13.25 | 2998                  | Morphological Characteristics Resulted By Colchicine Treatment In Phalaenopsis spp.                                | Samanhudi,<br>Sri Hartati,<br>Ongko Cahyono,<br>Agung Wibowo, and<br>Ferina Ardiani | Sebelas<br>Maret<br>University      |
| 2         | 13.25<br>-<br>13.35 | 3019                  | Induction of Polyploidy Using Colchicine in Flower Buds from Phalaenopsis Hybrids                                  | Sri Hartati,<br>Samanhudi,<br>Ongko Cahyono,<br>Agung Wibowo,<br>Hasna Afanin       | Sebelas<br>Maret<br>University      |
| 3         | 13.35<br>-<br>13.45 | 3087                  | Development Strategy of Robusta Coffee Business: Increasing Productivity and Improving the Quality and Consistency | Budi Dharmawan,<br>Adwi Herry Koesoema Elyanto,<br>Ratna Satriani                   | Jenderal<br>Soedirman<br>University |
| 4         | 13.45<br>-<br>13.55 | 3045                  | Biogas Purification with Adsorption Method on Variation of Purification Time and Gas Flow Rate                     | Abdul Mukhlis Ritonga,<br>Masrukhi Masrukhi,<br>Dewi Novita                         | Jenderal<br>Soedirman<br>University |
| 5         | 13.55<br>-<br>14.05 | 3058                  | The Roles of Agriculture, Forestry, and Fishery Sectors in The Economy of Banyumas Regency                         | Erlyna Wida Riptanti,<br>Sheila Megawati Gusmanto,<br>Refaul Khairiyakh             | Sebelas<br>Maret<br>University      |



| No | Time                | Paper ID | Title   | Authors  | Affiliation                   |
|----|---------------------|----------|---|--|-------------------------------|
| 6  | 14.05<br>-<br>14.15 | 2992     | Morphological Characteristics Resulted By Colchicine Treatment In Phalaenopsis spp.                     | Ferina Ardiani   |                               |
| 7  | 14.15<br>-<br>14.25 | 3021     | Morphological Characteristics of Phalaenopsis spp. by colchicine application based on Qualitative Data  | Ferina Ardiani   |                               |
| 8  | 14.25<br>-<br>14.35 | 3044     | Phosphate Response by Indigenous Microbes and Mycorrhizal Inoculation on Corn Plants in Inceptisol Soil | Fitriya -<br>Kulsum, Eko -<br>Hanudin, Jaka -<br>Widada  | Gadjah Mada University        |
| 9  | 14.35<br>-<br>14.45 | 2994     | Induction of Polyploidy Using Colchicine in Flower Buds from Phalaenopsis Hybrids                       | Hasna Afanin   | Sebelas Maret University      |
| 10 | 14.45<br>-<br>14.55 | 3046     | Feasibility Study of Citronella Agribusiness  | Irene Kartika<br>Eka Wijayanti,<br>nfn Sunendar,<br>Lutfi Zulkifli,<br>Rifki Andi<br>Novia, Alpha<br>Nadeira<br>Mandamdari,<br>Tatang<br>Widjojoko,<br>Adwi Herry<br>Koesoema<br>Elyanto, Syahrul<br>Ganda Sukmaya | Jenderal Soedirman University |

| No | Time                | Paper ID | Title  | Authors  | Affiliation                         |
|----|---------------------|----------|--|--|-------------------------------------|
| 11 | 14.55<br>-<br>15.05 | 3033     | The Effect Of Slow Release Coating Fertilizer on The Agronomic Character of Gogo Rice In Ultisol   | Kharisun<br>Kharisun, Budi<br>Prakoso,<br>Mochammad<br>Nazarudin<br>Budiono, sisno<br>sisno, Nafiatul<br>Bella Aisarda | Jenderal<br>Soedirman<br>University |
| 12 | 15.05<br>-<br>15.15 | 3029     | The Effect of Nitrogen Slow Release Coating Fertilizer on Soil Chemical Properties And N Upport Of Rice (Oryza Sativa L.) on Inceptisol Soil | Kharisun<br>Kharisun, Ratri<br>Noorhidayah,<br>Muhammad<br>Rif'an, Hana<br>Hanifa,<br>Maulidasari<br>Mussoefa          | Jenderal<br>Soedirman<br>University |
| 13 | 15.15<br>-<br>15.25 | 2986     | Respons of humic compounds on phosphorus uptake in leek plants (Allium fistulosum) in Ultisol, Somagede district                             | Ratri<br>Noorhidayah,<br>Muhammad<br>Bachtiar<br>Musthafa, sisno<br>sisno, nur afifah                                  | Jenderal<br>Soedirman<br>University |
| 14 | 15.25<br>-<br>15.35 | 2978     | Phenotype of Early Flowering Black Rice M2 Population  | Ristatina<br>Islamiati<br>Dzakirah,<br>Nandariyah<br>Nandariyah,<br>Parjanto<br>Parjanto                               |                                     |

| No | Time                | Paper ID | Title  | Authors   | Affiliation  |
|----|---------------------|----------|--|---|--|
| 15 | 15.35<br>-<br>15.45 | 3080     | Analysis of Transformational Leadership, Organizational Culture, and Work Stress on Fishery's Company Employee Performance during Covid 19 Pandemic            | Ksatria Refo<br>Harnawan<br>Putra,<br>Suharno, Didik<br>Purwadi   | Gadjah<br>Mada<br>University                                     |
| 16 | 15.45<br>-<br>15.55 | 3098     | Determination of Cost Volume Profit Analysis as a Short-Term Profit Planning in the Women Farming Group of Dua Putri, Cilongak Sub District, Banyumas District | Ratna Satriani,<br>Budi<br>Dharmawan,<br>Nur Wijayanti,<br>Taufik Budhi<br>Pramono  | Jenderal<br>Soedirman<br>University                              |
| 17 | 15.55<br>-<br>16.05 | 3101     | Analysis and Design of Organic Farming System in Pakistan  | Adnan<br>Husain,<br>Ghulam Abbas<br>Shah, Um ul<br>Banin Zahra,<br>Muhammad<br>Faisal,<br>Muhammad<br>Jawad Hassan,<br>Muhammad<br>Awais, Abid<br>Ali, Asad Ali<br>Shah,<br>Alkhader Ali<br>Mokhaer<br>Muhammad | PMAS-Arid<br>Agriculture<br>University<br>Rawalpindi<br>Pakistan |
| 18 | 16.05<br>-<br>16.15 | 3100     | Non-Destructive Estimation of Total Sugar and Moisture Content of Granulated Coconut Sugar Using a Vis-NIR Spectral Sensor                                     | Susanto B.<br>Sulistyo, Arief<br>Sudarmaji,<br>Pepita<br>Haryanti,<br>Purwoko H.<br>Kuncoro   | Jenderal<br>Soedirman<br>University                              |

## ***Non-Destructive Estimation of Total Sugar and Moisture Content of Granulated Coconut Sugar using a Vis-NIR Spectral Sensor***

**Susanto B. Sulistyo<sup>1,\*</sup>, Arief Sudarmaji<sup>1</sup>, Pepita Haryanti<sup>2</sup>, Purwoko H. Kuncoro<sup>1</sup>**

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### **ABSTRACT**

Measurement of total sugar and moisture content of granulated coconut sugar are usually carried out destructively by chemical analysis and gravimetric methods. This study aimed to test the performance of a portable spectrometer based on the AS7265X optical sensor which is able to capture the reflectance of the Vis-NIR light spectrum. The granulated coconut sugar samples used in this study were produced from six treatments by adding cane sugar during coconut sap heating, i.e. 0%, 1%, 2%, 3%, 4%, and 5% (w/v). The Vis-NIR light reflectance of the produced coconut sugar was then measured using the developed portable spectrometer. For validation, the total sugar and water content samples of granulated coconut sugar were also measured destructively. The estimation of total sugar content and water content of granulated coconut sugar was carried out using the backpropagation neural network method. The results showed that the developed artificial neural network with 2 hidden layers can be used to estimate the total sugar and water content of granulated coconut sugar better than the artificial neural network with 1 hidden layer. The mean absolute percentage error (MAPE) of the developed artificial neural network with 2 hidden layers for the estimation of total sugar and water content were 0.62% and 12.89%, respectively.

**Keywords:** AS7265X, light reflectance, coconut sap, artificial neural network, spectrometer.