



THE 3rd ICSARD 2022
International Conference
on Sustainable Agriculture
for Rural Development



CERTIFICATE OF PARTICIPATION

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.



FACULTY OF AGRICULTURE
JENDERAL SOEDIRMAN UNIVERSITY



Organizing Committee
**The 3rd International Conference on Sustainable Agriculture for
Rural Development 2022 (3rd ICSARD 2022)**
Faculty of Agriculture Jenderal Soedirman University
Jl. Dr. Soeparno, Karangwangkal, Purwokerto, Indonesia 53123
Email: 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 3rd International Conference on Sustainable Agriculture for Rural Development (the 3rd 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 3rd 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 3rd ICSARD 2022 and look forward to your participation in this event.

Best regards,

Arief Sudarmaji, PhD.

Chairman of the 3rd ICSARD 2022 Committee



PROGRAM BOOK

THE 3rd 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 3rd International Conference on Sustainable Agriculture for Rural Development 2022 is organized by the Faculty of Agriculture, Jenderal Soedirman University

Secretariat Address

**Faculty of Agriculture
Jenderal Soedirman University
Jl. dr. Soeparno Telp (0281) 638791 Purwokerto 53123
Indonesia**



COMMITTEE OF THE 3rd ICSARD 2022

“Strengthening Sustainable Agriculture In The New Normal An Disruptive Technology Era”

- Steering Committee : 1. Dr. Anisur Rosyad
2. Dr. Hidayah Dwiyantri
3. Joko Maryanto, M.Si.
4. Dr. Siswantoro
- Organizing Committee : 1. Arief Sudarmaji, Ph.D. (Chairman)
2. Budi Dharmawan, Ph.D. (Vice
Chairman)
3. Prita Sari Dewi, Ph.D. (Secretary)
- International Scientific
Committee and
Advisory Board : 1. Atsushi Sakaguchi, Ph.D. (Yamaguchi
University, Japan)
2. Irshad Ullah, M.Sc., M.Eng (Vietnam
National University)
3. Assoc Prof. Koji Harashina, Ph.d. (Iwate
University, Japan)
4. Assoc. Prof. Nguyen Loc Hien, Ph.D.
(Ngee Ann Polytechnic, Singapore)
- National Scientific
Committee : 1. Karseno, Ph.D. (Jenderal Soedirman
University)
2. Prof. Dr. Hadiwiyono (Sebelas Maret
University)
3. Dr. Ardiansyah Michwan (Bakrie School
of Management)
4. Purwoko Hari Kuncoro, Ph.D. . (Jenderal
Soedirman University)
5. Woro Sri Suharti, Ph.D. . (Jenderal
Soedirman University)
6. Dr. Irene Kartika Eka Wijayanti .
(Jenderal Soedirman University)

- Program Committee : 1. Dr. Agus Riyanto
2. Dr. Ervina Mela
3. Dian Novitasai, M.Si.
4. Lutfi Zulkifli, M.Si.
5. Sunendar, S.P.
- Publication and Prosiding Committee : 1. Susanto Budi Sulisty, Ph.D.
2. Abdul Mukhlis Ritonga, M.Sc.
3. Ratna Satriani, M.Sc.
- Promotion Division : 1. Sapto Nugroho Hadi, M.Biotech
2. Sawitania C.D.U.B Situmorang, M.Si.
3. Muhammad Bachtiar Musthafa, M.P.
- Information Technology and Logistics Division : 1. Dr. Purwanto
2. Ruly Eko K. Kurniawan, M.P.
3. Ali Maksum, M.P.
4. Evi Widhi Astuti, A.Md.
5. Andi Nugroho, S.Kom
6. Soni Supriyadi
7. Tarso
8. Kasdi
- Website and Registration Division : 1. Dr. Etik Wukir Tini
2. Agus Suroto, M.Si.
3. Rifki Andi Novia, M.Sc.
4. Ahmad Arijal Lutfi, S.Kom
- Secretariat : 1. Kusja, M.AP.
2. Eko Sulissetyaningsih, M.M.
3. Ni Wayan Anik Leana, M.P.
4. Eka Oktaviani, M.Biotech
5. Achmad Noor, S.Sos.
6. Suwito, S.E.
7. Titin Anggraeni, A.Md
8. Muhammad Yazid Fachlefie, S.E.
9. Septi Dewi Yanti, A.Md.
- Consumption Division :: 1. Astuti Mubarokatin, S.Pd.
2. Asti Harsyanti, S.Sos.

MEETING SCHEDULE OF THE 3rd 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	Opening Ceremony 1. National Anthem "Indonesia Raya" 2. Prayer 3. Report by Chairman 4. Opening Remarks by Dean of Faculty of Agriculture, Jenderal Soedirman University 5. Photo Session Master of Ceremony: Dr. Ervina	Zoom
08:30-12:00	Plenary Session Moderator: Dr. Prita Sari Dewi	Zoom
08:30-09:15	Keynote Speaker: Dr. Ir. Kasdi Subagyo, M.Sc (Secretary General of the Ministry of Agriculture, Republic of Indonesia)	
	Invited Speakers:	
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	Break	
13.00-13.15	Participants enter the break out room	Zoom
13:15-17:15	Parallel Session (See detail parallel section)	Zoom
17.15-17.30	Closing Ceremony 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 - 13.25	2998	Morphological Characteristics Resulted By Colchicine Treatment In Phalaenopsis spp.	Samanhudi, Sri Hartati, Ongko Cahyono, Agung Wibowo, and Ferina Ardiani	Sebelas Maret University
2	13.25 - 13.35	3019	Induction of Polyploidy Using Colchicine in Flower Buds from Phalaenopsis Hybrids	Sri Hartati, Samanhudi, Ongko Cahyono, Agung Wibowo, Hasna Afanin	Sebelas Maret University
3	13.35 - 13.45	3087	Development Strategy of Robusta Coffee Business: Increasing Productivity and Improving the Quality and Consistency	Budi Dharmawan, Adwi Herry Koesoema Elyanto, Ratna Satriani	Jenderal Soedirman University
4	13.45 - 13.55	3045	Biogas Purification with Adsorption Method on Variation of Purification Time and Gas Flow Rate	Abdul Mukhlis Ritonga, Masrukhi Masrukhi, Dewi Novita	Jenderal Soedirman University
5	13.55 - 14.05	3058	The Roles of Agriculture, Forestry, and Fishery Sectors in The Economy of Banyumas Regency	Erlyna Wida Riptanti, Sheila Megawati Gusmanto, Refaul Khairiyakh	Sebelas Maret University

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

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

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

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

Susanto B. Sulisty^{1,*}, Arief Sudarmaji¹, Pepita Haryanti², Purwoko H. Kuncoro¹

¹Department of Agricultural Engineering, Faculty of Agriculture,
JenderalSoedirman University, Purwokerto, INDONESIA

²Department of Food Technology, Faculty of Agriculture, JenderalSoedirman
University, Purwokerto, INDONESIA

*Corresponding author. Email: susanto.sulisty@unsoed.ac.id

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 granulatedcoconut 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, thetotal sugar and water content samples of granulatedcoconut sugar were also measured destructively. The estimation of total sugar content and water content of granulatedcoconut 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 granulatedcoconut 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.