

Free Full Text from Publisher

Full Text Links ▾



Export ▾

Add To Marked List

< 1 of 1 >

By: [Tan, MISMH](#) (Mohd Hilmi Tan, Mas Ira Syafila)¹;
[Jamlos, MF](#) (Jamlos, Mohd Faizal)¹; [Omar, AF](#) (Omar, Ahmad Fairuz)²;
[Dzaharudin, F](#) (Dzaharudin, Fatimah)³;
[Chalermwisutkul, S](#) (Chalermwisutkul, Suramate)⁴;
[Akkaraekthalin, P](#) (Akkaraekthalin, Prayoot)⁵

[View Web of Science ResearcherID and ORCID](#) (provided by Clarivate)

SENSORS

Volume: 21 **Issue:** 9

Article Number: 3052

DOI: 10.3390/s21093052

Published: MAY 2021

Document Type: Review

Abstract

Ganoderma boninense (*G. boninense*) infection reduces the productivity of oil palms and causes a serious threat to the palm oil industry. This catastrophic disease ultimately destroys the basal tissues of oil palm, causing the eventual death of the palm. Early detection of *G. boninense* is vital since there is no effective treatment to stop the continuing spread of the disease. This review describes past and future prospects of integrated research of near-infrared spectroscopy (NIRS), machine learning classification for predictive analytics and signal processing towards an early *G. boninense* detection system. This effort could reduce the cost of plantation management and avoid production losses. Remarkably, (i) spectroscopy techniques are more reliable than other detection techniques such as serological, molecular, biomarker-based sensor and imaging techniques in reactions with organic tissues, (ii) the NIR spectrum is more precise and sensitive to particular diseases, including *G. boninense*, compared to visible light and (iii) hand-held NIRS for in situ measurement is used to explore the efficacy of an early detection system in real time using ML classifier algorithms and a predictive analytics model. The non-destructive, environmentally friendly (no chemicals involved), mobile and sensitive leads the NIRS with ML and predictive analytics as a significant platform towards early detection of *G. boninense* in the future.

Keywords

Author Keywords: [oil palms](#); [near-infrared spectroscopy](#); [NIR spectrum ML classifier algorithms](#)

Keywords Plus: [BASAL STEM ROT](#); [OIL-PALM](#); [REFLECTANCE SPECTROSCOPY](#); [PERENNIAL RYEGRASS](#); [SPECTRAL FEATURES](#); [BSR DISEASE](#); [IDENTIFICATION](#); [DEFENSE](#); [INFECTION](#); [LEAVES](#)

Author Information

Corresponding Address: Jamlos, Mohd Faizal (corresponding author)

▼ Univ Malaysia Pahang, Coll Engr, Gambang 26300, Malaysia

Addresses:

▼ ¹ Univ Malaysia Pahang, Coll Engr, Gambang 26300, Malaysia

0

Citations

[Create citation alert](#)

Cited References

129

[View Related Records](#)

You may also like...

RENARD, JL; DEFRANQUEVILLE, H; OUVRIER, M; et al.

[STUDY OF IMPACT OF VASCULAR WILT ON FFB PRODUCTION IN OIL PALM](#)
OLEAGINEUX

Bonneau, X; Vandessel, P; Erhahuyi, C; et al.
[Early impact of oil palm planting density on vegetative and oil yield variables in West Africa](#)
OCL-OILSEEDS AND FATS CROPS AND LIPIDS

Rusli, N; Majid, MR;
[Monitoring and mapping leaf area index of rubber and oil palm in small watershed area](#)
8TH INTERNATIONAL SYMPOSIUM OF THE DIGITAL EARTH (ISDE8)

Eisenstecken, D; Sturz, B; Oberhuber, M; et al.
[The potential of near infrared spectroscopy \(NIRS\) to trace apple origin: Study on different cultivars and orchard elevations](#)
POSTHARVEST BIOLOGY AND TECHNOLOGY

deAldana, BRV; GarciaCriado, B; PerezCorona, ME; et al.

[Non-destructive method for determining ash content in pasture samples: Application of near infrared reflectance spectroscopy](#)
COMMUNICATIONS IN SOIL SCIENCE AND PLANT ANALYSIS

[See all](#)



- ▼ ² Univ Sains Malaysia, Sch Phys, Gelugor 11800, Malaysia
- ▼ ³ Int Islamic Univ Malaysia, Dept Mech, Kuliyyah Engr, Jalan Gombak, Selangor 53100, Malaysia
- ▼ ⁴ King Mongkuts Univ Technol North Bangkok, Sirindhorn Int Thai German Grad Sch Engr TGGS, Bangkok 10800, Thailand
- ▼ ⁵ King Mongkuts Univ Technol North Bangkok, Fac Engr, Bangkok 10800, Thailand

E-mail Addresses: masira.hilmitan@gmail.com; mohdfaizaljamlos@gmail.com; fairuz_omar@usm.my; fatimahdz@iiium.edu.my; suramate.c.ce@tggs-bangkok.org; prayoot.a@eng.kmutnb.ac.th

Categories/Classification

Research Areas: Chemistry; Engineering; Instruments & Instrumentation

Funding

Funding agency	Grant number	Show All Details
Ministry of Higher Education & Scientific Research (MHESR) MTUN	FRGS/1/2019/STG02/UMP/01/1	Show details
Matching grant	UIC211503	
	RDU212802	

[View funding text](#)

Document Information

Language: English

Accession Number: WOS:000650779100001

PubMed ID: 33925576

eISSN: 1424-8220

Other Information

IDS Number: SC6LD

[— See fewer data fields](#)

Use in Web of Science

Web of Science Usage Count

5

Last 180 Days

5

Since 2013

[Learn more](#)

This record is from:

Web of Science Core Collection

Science Citation Index Expanded (SCI-EXPANDED)

Suggest a correction

If you would like to improve the quality of the data in this record, please [Suggest a correction](#)

Journal information

SENSORS

eISSN: 1424-8220

Current Publisher: MDPI, ST ALBAN-ANLAGE 66, CH-4052 BASEL, SWITZERLAND

Research Areas: Chemistry; Engineering; Instruments & Instrumentation

Web of Science Categories: Chemistry, Analytical; Engineering, Electrical & Electronic; Instruments & Instrumentation

3.576

Journal Impact Factor™ (2020)

129 Cited References

Showing 30 of 129

[View as set of results](#)



1	<p>P2.1.7 Exploring MIP Sensor of Basal Stem Rot (BSR) Disease in Palm Oil Plantation</p> <p>Abdullah, A.H.; Hamid, N.H.; (...); Shakaff, A.Y.M. Proceedings of the Proceedings IMCS 2012 2012 P P IMCS 2012 NUR GE , pp.1348-1351</p>	<p>1 Citation</p> <hr/> <p>0 References</p>
---	---	---

--	--	--

--	--	--

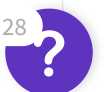
--	--	--

--	--	--

--	--	--

--	--	--

--	--	--



Empty content area with six stacked rectangular boxes.

© 2021 Clarivate
Training Portal
Product Support

Data Correction
Privacy Statement
Newsletter

Copyright Notice
Cookie Policy
Terms of Use

Follow Us

