

# A COFFEE AND COCOA RESEARCH JOURNAL



## About the Journal

**Pelita Perkebunan**, Coffee and Cocoa Research Journal (CCRJ): ISSN:0215-0212; E-ISSN:2406-9574

Since its establishment in 1911, Indonesian Coffee and Cocoa Research Institute (ICCRI) formerly Besoekisch Proefstation, had published its research findings through a journal call *Mededelingen van het Besoekisch Proefstation*. Between 1948-1981 the research institute was under the supervision of Bogor Research Institute for Estate Crops, and published its research findings through *De Bergcultures* which was later changed to *Menara Perkebunan*.

Since the institute held the national mandate for coffee and cocoa commodities, and due to rapid increase in the research findings, ICCRI published its first issue of **Pelita Perkebunan** journal in April 1985.

**Pelita Perkebunan** is an international journal providing rapid publication of peer-reviewed articles concerned with coffee and cocoa commodities based on the aspects of agronomy, plant breeding, soil science, crop protection, postharvest technology and social economy. Papers dealing with result of original research on the above aspects are welcomed with no page charge.

**Pelita Perkebunan** is managed by Indonesian Coffee and Cocoa Research Institute (ICCRI), which publish the research findings not only for coffee and cocoa but also other commodities relevant with coffee and cocoa, i.e. shade trees, intercrops and wind breakers.

**Pelita Perkebunan** is published in a single volume every year. Each volume consists of three issues, published in April, August and December.

Welcome to <http://www.ccrjournal.com>, the online submission and editorial system of the **Pelita Perkebunan**.

Manuscripts must be directed to the Secretariat of the Journal at the following address:

### Editor-in-Chief,

**Pelita Perkebunan (Coffee and Cocoa Research Journal)**  
Indonesian Coffee and Cocoa Research Institute  
Jl. P.B. Sudirman 90, Jember 68118, Indonesia.  
E-mail: [pelita@iccri.net](mailto:pelita@iccri.net), Tel. (0331) 757130.  
Fax. (0331) 757131.

### Accredited:

SK Menteri Penerangan Republik Indonesia  
No. 1234/SK/DITJEN PPG/STT/1988

SK Kepala LIPI  
No. 638/AU3/P2MI-LIPI/07/2015  
15 Juli 2015

- Each issue is printed 500 copies, free download available at [www.iccri.net](http://www.iccri.net) and [www.ccrjournal.com](http://www.ccrjournal.com).
- Printed by "Amore Digital Printing", Sumsersari, Jember.

## Publisher

Indonesian Coffee and Cocoa Research Institute

## Patron/Director

Misnawi

## EDITORIAL TEAM

### Editor-in-Chief

**John Bako Baon**, Soil and Water Laboratory, Indonesian Coffee and Cocoa Research Institute, Jember, Indonesia

### Co-Editor

**Agung Wahyu Susilo**, Plant Breeding Laboratory, Indonesian Coffee and Cocoa Research Institute, Jember, Indonesia.

**Pujiyanto**, Soil and Water Laboratory, Indonesian Coffee and Cocoa Research Institute, Jember, Indonesia

**A. Adi Prawoto**, Plant Physiology Laboratory, Indonesian Coffee and Cocoa Research Institute, Jember, Indonesia.

**Sukrisno Widoyotomo**, Postharvest Laboratory, Indonesian Coffee and Cocoa Research Institute, Jember, Indonesia.

### Technical Editor

**Reny Fauziah Oetami**, Production Section, Indonesian Coffee and Cocoa Research Institute, Jember, Indonesia.

**Kristya Widya Nugroho**, Data Base Section, Indonesian Coffee and Cocoa Research Institute, Jember, Indonesia.

**Sujiwo**, Publication Section, Indonesian Coffee and Cocoa Research Institute, Jember, Indonesia.

### Editorial Board/Reviewer

**Agus Susanto**, Indonesian Oil Palm Research Institute, Medan, Indonesia.

**Dapeng Zhang**, USDA Sustainable Perennial Crops Lab., Beltsville, USA.

**Dewa Ketut Sadra Swastika**, Center of Social Economic and Agriculture Policy Analysis, Bogor, Indonesia.

**Didy Soepandie**, Faculty of Agriculture, Bogor Agricultural University, Bogor, Indonesia.

**Eko Handayanto**, Faculty of Agriculture, Brawijaya University, Malang, Indonesia.

**Happy Widiastuti**, Indonesian Research Institute for Biotechnology and Bioindustry, Bogor, Indonesia.

**Nugroho Susetya Putra**, Faculty of Agriculture, Gadjah Mada University, Yogyakarta, Indonesia.

**Nur Basuki**, Faculty of Agriculture, Brawijaya University, Malang, Indonesia.

**Panjisakti Basunanda**, Faculty of Agriculture, Gadjah Mada University, Yogyakarta, Indonesia.

**Peter McMahon**, Department of Botany, La Trobe University, Victoria, Australia.

**Rina Sriwati**, Faculty of Agriculture, Syah Kuala University, Banda Aceh, Indonesia.

**Sabariah Samsudin**, Malaysian Cocoa Board, Cocoa Innovation & Technology Centre, Malaysia.

**Sinung Hendratno**, Indonesian Rubber Research Institute, Bogor, Indonesia.

**Sri S. Tjitrosoedirdjo**, SEAMEO BIOTROP, Bogor, Indonesia.

**Suhatmini Hardyastuti**, Faculty of Agriculture, Gadjah Mada University, Yogyakarta, Indonesia.

**Suparlan**, Faculty of Agriculture Technology, Gadjah Mada University, Yogyakarta, Indonesia.

**Teguh Wikan Widodo**, Research Institute for Agricultural Mechanization, Serpong, Jakarta, Indonesia.

**Teti Estiasih**, Faculty of Agriculture Technology, Brawijaya University, Malang, Indonesia.

**Yusnita Said**, Faculty of Agriculture, University of Lampung, Bandar Lampung, Indonesia.