

Author: [ADVANCED](#)Volume Page Keyword: 
[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN : 1349-1008

PRINT ISSN : 1343-943X

Plant Production Science

Vol. 7 (2004) , No. 3 356-362


[\[PDF \(129K\)\]](#) [\[References\]](#)

Maize-Soybean-Cowpea Sequential Cropping as a Sustainable Crop Production for Acid-Infertile Clay Soils in Indonesia

[Yasuhiro Izumi](#)¹⁾, [Erwin Yuliadi](#)²⁾, [Sunyoto](#)²⁾ and [Morio Iijima](#)³⁾

1) School of Environmental Science, The University of Shiga Prefecture

2) Faculty of Agriculture, University of Lampung, JL.

3) Graduate School of Bioagricultural Sciences, Nagoya University

(Received: December 15, 2003)

Abstract: At mid-elevation terraces in the southern part of Sumatra Island, Indonesia, cassava is widely cultivated as one of the most important cash crops for farmers. However, the prominent cassava cultivation system includes the intercropping of cereal crops and rapidly depletes soil fertility. Hence establishment of a sustainable food-crop production system without cassava cultivation is required. A three-way experiment with maize-soybean-cowpea sequential cropping was designed to investigate the following main effects: tillage or no-tillage, mulching or no-mulching and government recommendation or farmers' traditional fertilization. Crop productivity and soil erosion were used as indicators of sustainability. At the end of the experiment, root system development of soybean was assessed to elucidate the cumulative effects of treatments on the soil environment for root growth. Fertilization treatments increased yields in all years, whereas mulching significantly increased only from the third year. The no-tillage treatment tended to reduce yields. Soybean root growth at surface level was markedly reduced by no-tillage and slightly improved by mulching. Erosion was reduced by mulching, no-tillage, and fertilization by the government recommendation. Because of its cumulative effect on increasing soil fertility and reducing erosion, the practice of mulching was highly recommended. A sufficient amount of fertilization (government level) was also recommended to maintain the fertility and to support sufficient plant growth to minimize erosion. The no-tillage practice was not recommended because it reduced crop yields, although the treatment efficiently controlled soil erosion.

Keywords: [Cowpea](#), [Erosion](#), [Maize](#), [Mulching](#), [Red acid soil](#), [Root growth](#), [Soybean](#)



[\[PDF \(129K\)\]](#) [\[References\]](#)

Download Meta of Article [\[Help\]](#)

[RIS](#)

[BibTeX](#)

To cite this article:

Yasuhiro Izumi, Erwin Yuliadi, Sunyoto and Morio Iijima: "Maize-Soybean-Cowpea Sequential Cropping as a Sustainable Crop Production for Acid-Infertile Clay Soils in Indonesia". *Plant Production Science*, Vol. 7, pp.356-362 (2004) .

doi:10.1626/pps.7.356

JOI JST.JSTAGE/pps/7.356

Copyright (c) 2004 by The Crop Science Society of Japan



[Japan Science and Technology Information Aggregator, Electronic](#)

