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## Application of Straw Compost and Biofertilisers to Remediate the Soils Health and to Increase the Productivity of Paddy Rice in Indonesia

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### Abstract

The intensive use of inorganic fertilisers and agrochemical products during the green revolution (early 1960s) had a great impact on the decline of soil health and soil quality. Based on the latest investigations, the soil organic content has decreased sharply within 30 years. Various field studies revealed that most of the paddy soils in Indonesia have been exhausted, as indicated by a low organic matter content (<1,5 - 2%) and depletion of some essential nutrients, such as K and Si. Restoring the paddy soil fertility can be done by managing straw and biofertiliser application combined with output oriented integrated fertiliser management. Since 3 years, straw compost and biofertilisers as environmentally friendly low cost fertilisers were introduced to remediate soil health and to increase paddy rice productivity in several areas in Indonesia. The application of 2–5 ton ha<sup>-1</sup> of straw compost combined with 400–1000 g ha<sup>-1</sup> of biofertiliser inoculants (consortia of non-symbiotic nitrogen fixers and phosphate solubilising bacteria) or *Azolla* had a significant positive effect on soil organic carbon, the biodiversity of beneficial soil organisms, as well as on the growth and yield of paddy rice. In addition, the application of inorganic fertilisers was reduced by 25–50% and the productivity of paddy rice was increased by at least 25%. Particularly carbon, silica and potassium were supplied by straw compost. Consequently, the remediation and maintenance of soil health for sustainable rice cultivation can be achieved by rice straw and biofertiliser application.

**Keywords:** Biofertilisers, organic fertilisers, paddy soils, soil health, straw compost