



Tropentag, October 7-9, 2008, Hohenheim

“Competition for Resources in a Changing World:  
New Drive for Rural Development”

## New Varieties of Rice through Gamma Rays Application to Tackle Food Disaster in East Java Regions, Indonesia

SUMARDI HS<sup>1</sup>, NUNUN BARUNAWATI<sup>2</sup>

<sup>1</sup>*Brawijaya University, Food Technology, Indonesia*

<sup>2</sup>*Brawijaya University, Agronomy, Indonesia*

### Abstract

Paddy (*Oryza sativa* L.) is the staple food in several regions of Indonesia. Main problems in the rural areas there are that the surfaces for crop farming are delining and that the number of varieties that are adapted to the current agroecological conditions is decreasing. In 1993, Indonesia produced ca. 48.2 t ha<sup>-1</sup> of paddy. This production rose slightly to 52.2 t ha<sup>-1</sup> in 1998. However, the production increase could comply with the population development in Indonesia.

There are several ways for obtaining improved seed. For instance, through breeding new varieties with a high nutritional value or through selecting for varieties that particularly tolerate certain abiotic and biotic stresses. Breeding and mutation application are two techniques commonly used in Indonesia for enhancing plant variability. The mutation method uses gamma-rays to establish mutants that can be screened for the wanted characteristics. It is very important to identify seeds that can be used under extreme conditions as for example under very dry conditions, or on soils with high salinity.

The production of improved rice seed through gamma-rays application was enabled through collaboration with the Nuclear Centre Association. Consequently, several main characteristics such as dwarf growth, pest tolerance and natural protection against disease attacks, could be found in the produced rice seed mutants. The newly identified varieties Mira-I, Yuwono and Diah Suci are already widely spread at several locations of the East Java region. The first results showed that the mutation rice can produce about 9.8 t ha<sup>-1</sup> of rice and is absolutely tolerant to pests and diseases. This gamma-rays method is an alternative for acquiring both new phenotypes and increase genotype variability.

**Keywords:** Mutation, rice, *Oryza sativa*