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IMPROVING SUBMERGENCE TOLERANCE IN THAI RICE USING ELECTRON BEAM INDUCED MUTATIONS

The devastating 2011 flood in Thailand was the worst in 50 years and caused significant yield losses in rice. Thus, submergence-tolerant rice is highly desirable to enhance food security. RD31 is a non-glutinous, photoperiod-insensitive rice variety with resistance to white-black plant hopper, and due to its several preferable agricultural traits, it is popular with farmers and consumers. RD31 seed was irradiated with 0.44 kGy electron beam. M1 plants were planted as Hill plots in January 2014 and 500 panicles from the main tiller were collected. M2 plants were planted as panicle/row for 500 rows (10,000 plants in total). Agricultural traits, such as plant height and maturity date were observed. Seeds from six plants in each row were collected as M3 seeds. About 3,000 M3 plants were screened for submergence tolerance, and 317 tolerant mutant lines were identified. M4 plants were screened for blast resistance. The result showed that all mutant lines were highly resistance. Some of them were screened for submergence tolerance and 91 tolerant mutant lines were identified. Furthermore, screening for grain quality, six mutant lines had 23.2-24.4 % amylose content (i.e. a moderate amylose content); RD31 has a higher (27.5%) amylose content. Most selected mutant lines also had clear grain or were less chalky. Furthermore, it was found that some mutant lines had early maturity which was 117-124 days while RD31 had 131 days to maturity. M5 plants were evaluated for important agronomic characters and yield trials were conducted. The experiment is still under progress. Some information is still needed for further conclusion before the release of the new rice variety.

Country or International Organization

Thailand

Author: Dr KLAHAENG, kanchana (Plant breeder)

Co-authors: Ms SARSU, Fatma (Plant Breeder/Genetics); Mrs PROMNART, Udompan (Plant breeder)

Presenter: Dr KLAHAENG, kanchana (Plant breeder)

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