

Abstract

This participatory research engaged farmers to meet the following objectives: (1) to select local rice hybrids that resistant to gall midge and photoperiod insensitive (F4-F5); (2) to select of local rice varieties for special quality nutritious; (3) to study methods to improve local rice seed quality; (4) to study the water saving method by non-flooded soil condition; (5) to test the performance of bio-substances for white grubs protection in upland rice; and (6) to study on restoration of soil fertility for upland rice.

Results show that (1) the F4 hybrids of 4 local varieties were flowered during the dry season will be grown in each village in the rainy season for gall midge resistance of F5 hybrids. (2) The roast method of paddy rice had no affected to protein of rice grain, moreover the crude fat of rice was increased from 0.62% to 1.53% and the brown rice was highest as 4.71% of crude fat. There was found that rice obtained the highest concentrations of Fe as 49.8 ppm that higher than brown rice (42.13 ppm) and non-roasted rice (32.2 ppm) respectively. (3) A single planting and roguing technique are accepted by farmers, which reduced seed contamination by 25%, a level seeds quality was carried the standard 90%. (4) Non-flooded soil condition was saved water by 35-38%, that rice yields were more 8-9% than flooded soil. (5) The herbal extract powder of *Stemona ceae* and *Faba ceae* use rate as 4 g/ hole, which found less a percentage of Yellow Dwarf symptoms and no white grubs. (6) The system of conservation and restoration of soil fertility were chose two systems, including growing soybean was followed paddy rice and ridge of legumes grown obstruct in the slope with nutrient management for upland rice system, which have to do research 2-3 continuous years. Those researches were still need to participate with farmers for produce rice quality and sustainable of rice cultivation on highland communities.

Keywords: Highland, Local rice seed, Gall midge, Non-flooded soil condition, Value-added, Bio-substances, Soil fertility