

# Evaluation of Cultivation Method in Wheat Variety ‘Satonosora’ in Upland Fields Converted from Paddy in Chiba prefecture. —Analysis of the Factors of Instability for Grain Yield and Quality—

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## Summary

We studied the effects of air temperature and precipitation, nitrogen fertilizer and cropping system on grain yield, and quality of wheat variety ‘Satonosora’ in upland fields converted from paddies with Farm-Oriented Enhancement for Aquatic System (FOEAS) in Chiba prefecture. The results are summarized as follows.

1. There was no significant correlation between yield and mean air temperature from sowing to maturity at each field, except for low temperature during the early growth of wheat caused by very late sowing (early in January). However, it was suggested that the grain yield affected by field conditions such as soil moisture and fertility, because the grain yields were lower in the first year than the second year after the field conversion.

2. The grain yield could increase with increased nitrogen top-dressing at jointing stage within the same year, while the other factor(s) could also influence the instability of grain yield. Moreover, the increase in applied nitrogen fertilizer had a low impact on the grain yield, suggested that the wheats harvested after 2015 in

these farmer’s field could not use nitrogen effectively.

3. The grain yields and protein contents of wheat in the second-year upland field, following soybean, were constantly higher than those in the first-year upland field converted from paddy, following rice. Rice-wheat-soybean crop rotation system of seven-crop per five-year was adequate for an enhancement of grain yield and protein content in wheat. It was suggested that the higher yield of wheat cultivated following soybean could be due to an increased supply of available nitrogen from soil organic matters decomposed by the soybean. However, in case of three-years soybean-wheat rotation, the grain yields of wheat decreased compared with those harvested the previous year. Therefore, it was considered that the soil nitrogen fertility in the fields was reduced by continuous soybean cultivation. We suggested that an application of organic matters, such as manure composts, crop residues, and green manure, is important to obtain stable high yields in paddy rice and upland crops rotation.