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## Varietal Differences in Tillering and Yield Responses of Rice Plants to Nitrogen-Free Basal Dressing Accompanied with Sparse Planting Density in the Tohoku Region of Japan

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**Abstract:** At present, the main challenge in rice production is to achieve a high and stable yield with low input. In this study, the growth of tillers and yield of 12 rice cultivars and lines in the practice of nitrogen-free basal dressing with sparse planting density (BNo) was examined and compared with those in the conventional cultivation (CONT). The results in 1999, 2000 and 2001 showed that the numbers of both primary and secondary tillers  $m^{-2}$  were smaller in BNo than in CONT for all cultivars. However, a large number of tillers in CONT, especially the secondary tillers, were nonproductive, and most of those in BNo were productive. The difference between BNo and CONT in the number of panicles  $m^{-2}$  was larger for the cultivars of the panicle-number type than for those of the panicle-weight type. Grain yield was often lower in BNo than in CONT, and the yield averaged over years and cultivars was  $748 g m^{-2}$  in BNo and  $772 g m^{-2}$  in CONT (the ratio of value in BNo to that in CONT was 97 %). The difference between BNo and CONT in grain yield varied with the cultivar and the year. Under favorable weather conditions in 2000 and 2001, grain yield was high in both CONT and BNo, and was higher in CONT than in BNo for most cultivars. Nevertheless, under the unfavorable weather condition in 1999, grain yield was low in both CONT and BNo, and was similar or higher in BNo than in CONT. In all 3 years, the grain yield of Akitakomachi and Fukuhibiki was lower, and that of Ouu316 and Hitomebore tended to be higher in BNo than in CONT. The practice of BNo was found to be effective for achieving a stable and high yield of Ouu316 and Hitomebore in the Tohoku region.

**Keywords:** [Nitrogen-free basal dressing](#), [Rice cultivars](#), [Sparse planting density](#), [Weather conditions](#), [Yield](#)



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