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Performance of Wheat Varieties under Different Tillage Systems in Bangladesh

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Abstract

Wheat, as second ranked winter cereal crop both in acreage and production, plays an important role in reducing food shortage in Bangladesh. To meet the increasing demand for food cereals in Bangladesh, efforts are being made to develop improved wheat varieties and cultivation practices with high yield potential that lower farmers' production costs. Cultivation of wheat on raised beds is gaining popularity in Bangladesh. In this technique, the raised beds are prepared by a single pass using a bed planter machine that simultaneously seeds and fertilises two rows of wheat on top of the beds. Irrigation water is applied through the furrows between the beds. Typically, the bed planter is connected to a power tiller that is commonly used all over Bangladesh. These techniques have been reported to result in higher grain production, as well as reduced costs by 25% as ploughing and seeding are done by one or two passes only in comparison to 3–4 passes under conventional system. By irrigation in furrows rather than by flooding, irrigation water can also be saved. A farmer's involved research trial was conducted in Faridpur district, Bangladesh, during the 2012–13 rabi season to observe the performance of wheat varieties under two cultivation techniques, bed planting and conventional tillage systems. Four wheat cultivars BARI Gom 25, BARI Gom 26, Prodip and Shatabdi were considered. BARI Gom 26 produced the highest grain yield (4.72 t ha^{-1}) among the varieties tested. The spike length (9.79 cm), number of grains per spike (42) and 1000-grain weight (43.24 g) were higher in plants cultivated under bed planting system compared to those in conventional tillage: 9.43 cm, 39 and 39.67 g, respectively. As such, bed planting technique gave significantly 14% higher grain yield over the conventional tillage systems (4.05 t ha^{-1}). A significant interaction was found when BARI Gom 26 was grown under bed planting. This combination provided the highest grain yield (4.98 t ha^{-1}), while the lowest yield was obtained from Shatabdi cultivated under conventional tillage systems (3.62 t ha^{-1}). Comparing cost and benefit, bed planting reduced cultivation costs (ploughing, seeding, weeding, irrigation, rat control) by around 30% compared to conventional tillage.

Keywords: Bed planting, conservation agriculture, conventional tillage