Deep planting technology for sustainably producing sugarcane

Production | Demonstration | Item: Sugarcane | Labor productivity enhancement | Climate disaster mitigation

Outline

Deep planting sugarcane increases the yield of plant and ratoon crops as seed canes are planted deeper than in conventional practices. Deeper planting enhances the resistance of stools to uprooting, increasing their suitability for mechanical harvesting. This method increases the germination rate and early growth under low-rainfall conditions as well as lodging resistance, which can help mitigate crop damage due to droughts and typhoons.

Background/effect/note

As sugarcane is an important crop for food and energy production, the declining yields due to climate change are cause for concern. Technologies to increase sugarcane productivity under climate change conditions must be developed. Ratoon crops are regrown from harvested crop stubble without replanting, which reduces production costs and energy inputs as well as benefits the environment through reducing soil erosion and increasing fertilizer use efficiency compared with plant crops. The productivity of ratoon and plant crops must be increased to sustain sugarcane production. The Japan International Research Center for Agricultural Sciences has implemented deep planting technology, which involves planting at a depth of approximately 30 cm instead of the conventional 10–20 cm, in Thailand through joint research with local sugar mills and Japanese agricultural machinery manufacturers. Deep planting in northeast Thailand increased cane yields in plant and ratoon crops by more than 10% compared with conventional planting yields (Fig. 1). The germination rates were higher and growth was earlier with deep planting in the Philippines under drought conditions, and lodging due to typhoons was reduced (Fig. 2). Deep planting can support sustainable sugarcane production across the Asia-Monsoon region through enhancing productivity and lowering the environmental impacts of production. Germination rates may be low with deep planting in areas where waterlogging persists after planting, owing to the deeper furrows used.

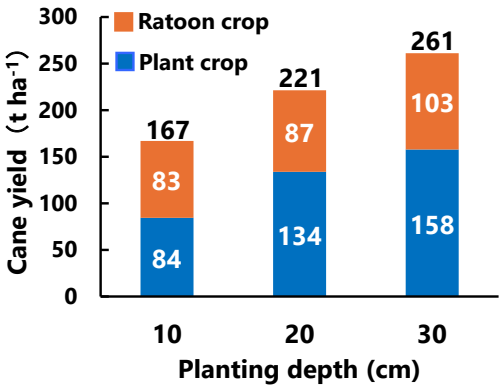

Fig. 1. Cane yield in northeast Thailand. Planting: October 2015; Harvest of plant crop: December 2016; Harvest of ratoon crop: January 2018. Variety: KK3.

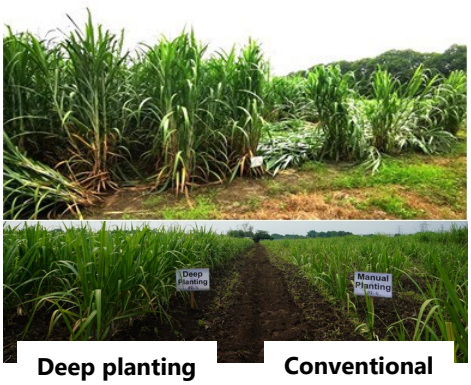

Fig. 2. Trials comparing deep and conventional planting in Luzon, The Philippines. Top: degree of lodging; bottom: early growth.

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