

Evaluation of mechanized planting of sugarcane

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ABSTRACT

Two-row semi-automatic drum type and automatic setts cutter sugarcane planters were tested as per RNAM test code to obtain actual data on overall machine performance viz., field capacity, field efficiency, fuel consumption. The planter consist of a sturdy frame accommodating seed metering mechanism, seed box, fertilizer box, insecticide tank, covering devices, revolving drum, ground wheels, power transmission unit and chute for dropping the setts. The automatic setts cutter planter is provided with cutter blades, which cut the whole sugarcane into setts of required length and drops them in the furrow. Whereas the semi-automatic planter required pre cut of desired length of setts (35-40 cm) to be fed to the planter. The effective field capacity was found to be 0.15 and 0.176 hah⁻¹ for semi-automatic and automatic planter, respectively. The field efficiency of semi-automatic and automatic planter was found to be 55.55% and 51.76% with cost of planting operation per hectare worked out to be Rs 1687 and Rs 1491, respectively compared to conventional sugarcane planting of Rs 1765. The number of setts required for 10 m row length was 23 and 24 in semi-automatic and automatic planter and overlapping of the setts was found 9-15 cm in automatic planter. Labour requirement for planting operation was 8 and 4 in semi-automatic and automatic planter and 32 labourers in conventional planting. It saved 75% and 87.50% labourers in semi-automatic and automatic planter compared to conventional practice.

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Sugarcane is one of the important cash crops in India cultivated in an area of about 4.0 million hectares with an average production of 75 tones/ha. Cultural operations for sugarcane production are very arduous requiring about 3300 man-hrs for different field operations (Anonymous, 2007). Most of the cultural and post harvest operations of sugarcane production in India are with traditional tools and methods involving a high cost of cultivation and human drudgery. It is a highly labour and energy intensive crop. Sugarcane planting is tedious, time consuming and expensive. It involves opening of furrows, proper placement of sugarcane setts and fertilizer and covering of sugarcane setts and fertilizer with soil. Sugarcane cultivation requires various operations like land preparation, planting, irrigation, interculturing, plant protection, harvesting, transportation that are done by indigenous equipments. Uniform distribution of seed pieces is a key indicator of quality of the planting operation. Inadequate farming techniques, low plant population, poor management, lack of modern and versatile equipment, for sugarcane cultivation are the main causes of low yield. The shortage of timely labours and exorbitant labours hiring rates force the farmers to limit their sugarcane acreage. Hence, there is an urgent need to mechanize these operations fully or partially in order to cut down man-h to reduce operational cost. The problem of non-availability of labours, higher cost of planting, timely operation and drudgery have forced sugarcane growers

to think of the use of machines for planting sugarcane. Traditionally, sugarcane has been planted manually. However, to have timelines in planting, planters have been developed. These planters are basically of two types widely known as two-row drum type sugarcane planter (semiautomatic) and two-row whole stick sugarcane cutter planter (automatic). Considering the importance of sugarcane planting, the experiment was conducted at different locations in Akola district on farmer's fields to assess the performance of the sugarcane planters.

METHODOLOGY

The field performance tests were conducted on nine farmers field comprising 5.2 ha area in Akola district. Planting was done using drum type planter available in Department of Farm Power and Machinery and whole stick cutter planter available in the Sugarcane Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (Fig. 1 and Fig. 2). The field performance tests were carried out to obtain actual data on overall machine performance, field capacity and cost of operation etc. by following RNAM test code (Bangali Baboo and Singh, 1997). The results obtained were compared with conventional planting method. Automatic sugarcane planter consists of sturdy frame accommodating seed metering mechanism, seed box, fertilizer box and insecticide tank. One pair of chute was also attached to the main frame for dropping the setts. In automatic planter,