DEVELOPMENT OF TRACTOR OPERATED STUBBLE SHAVER CUM FERTILIZER APPLICATOR FOR SUGARCANE CROP

ABSTRACT

Keywords: sugar cane, stubble shaver, off-barring operation, fertilizer drill,

Sugarcane is important cash crop in India. More than 80% of sugar is produced from sugarcane. Sometimes in draught condition; Sugarcane is also used as fodder for cattle. It plays a vital role in the socio-economic transformation of the country. Ratoon management in sugarcane cultivation is very important. Ratoon management operation consists of stubble shaving, off-barring, fertilizer application, interculturing etc.

In India most of the ratoon management work is done by traditional method with the help of animal drawn equipment’s. Traditional methods are time consuming, labour intensive, inefficient in utilization of available resources and higher operating cost. It is necessary to mechanize all these operations viz. stubble shaving, off-barring, fertilizer application. Therefore, the need was felt to develop a suitable tractor operated stubble shaver cum fertilizer applicator to achieve proper shaving of sugarcane stubble, trimming the old roots of crop, reverse the soil at a depth of 12 to 15 cm and placing the fertilizer in a desired rate with proper placement with drilling at near the root zone of crop at optimum cost. Therefore, tractor operated stubble shaver cum fertilizer applicator for sugarcane is developed at Department of Farm Machinery and Power Engineering, College of Agricultural Engineering and Technology, JAU, Junagadh, during the year 2018. The newly developed stubble shaver cum fertilizer applicator consists of main-frame cutting blade for stubble shaving, gear-box for converting the direction of rotation, two tynes for off-barring and reversing the soil and fertilizer metering mechanism to apply recommended quantity of the fertilizer.
The performance evaluation of this tractor operated stubble shaver cum fertilizer applicator was carried out to judge its performance in actual field condition before recommending it for use to sugarcane farmer. The performance evaluation of implement shows that the average effective field capacity of stubble shaver cum fertilizer applicator was 0.331 ha/h with 79.73 % field efficiency. The average depth of off barring operation was founded 15.01 cm. The depth of fertilizer placement was about 12.15 cm, which is as per recommendation. The average percentage of damage at ratoon was 11.97 %. With average stubble shaving efficiency of the implement was found to be 95.72 %.

The cost of operation was calculated as Rs.1574.37 ha/h. There was a net saving of Rs.7397.63 ha/h over conventional method. Thus, it can be said that the new developed implement performed the intended functions satisfactorily and can be recommended for use of sugarcane growers in Gujarat State.