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Faculty of Agriculture
ANNAMALAI UNIVERSITY
Annamalainagar - 608 002, Tamil Nadu, India

COMPARATIVE PERFORMANCE OF SINGLE AND DOUBLE FEEDER DIESEL OPERATED SISAL DECORTICATOR

Sitangshu Sarkar and Sk. Abdullah

Sisal Research Station (of CRIJAF) ICAR, PO: Bamra-768 221, Dist: Sambalpur, Orissa

Sisal (*Agave sisalana* Perrine ex Engelm., Family: Agavaceae) fibre is extracted from the leaves by process of scraping, which removes the extraneous green matter surrounding the fibre in the leaf leaving the fibre intact. The fibre extraction process from sisal leaves is called 'Decortication'. The decortication is done by a machine called 'Decorticator'. It consists of a drum measuring 12 inch (30.48 cm) diameter, on the periphery on which are mounted 12 bars/ blades made of angle-iron equally places at 3 inch apart. According to the leaf feeding system in the decorticators, it is classified into two types viz, single feeder (leaves are feed in one mouth by one operator) and double feeder (leaves are fed in two side-by-side mouths by two operators individually). In the single feeder decorticator the scrap blades or bars are smaller (L × B × T = 12 × 1 ½ × 1 inch) than the double decorticator blades (L x B x T = 18 × 1½ × 1 ¾ inch). The 12 blades or bars fixed on the periphery of the drum rotate against a fixed scrapper plate. The scrapper plate is of different dimension for single and double feeder decorticators. In the single

feed decorticators the size of the scrap plate is L × B × T = 12 × 3 × ½ inch and in the double feed decorticators it is bigger in size (L × B × T = 18 × 3½ × ½ inch). There is a small gap of 1 mm between the rotating scrap blades and the fixed scrapper plate through which the decorticated fibre remain intact hold in the hand of the operator. The decorticators run by an air cooled 6.4 HP diesel engines having ideal rpm of 1500. From the observation it was noted that the single feeder decorticator drum rotates with 1467 rpm and the double feeder decorticator drum rotate at 1325 rpm while in full operation.

It was observed that the single feeder decorticator requires 4 minutes 5 seconds to decorticate unsorted one standard bundle of 50 leaves and the double feeder decorticator requires only 2 minutes 7 seconds to do the same extraction job. The double feeder machine decorticated 2.04 times more number of leaves than single feeder decorticator which can decorticate only 835 leaves per hour. In terms of fibre yield out put, single feeder decorticator is less efficient as it could yield 6.92 kg/hr whereas; on an average double feeder decorticator produced 2.23 times more fibre per hour. The double feeder decorticator showed higher fibre yield per hour (2.32 times of single feeder) if the leaves are long (>90 cm) and medium (60-90 cm). Short leaf length (<60 cm) reduce the out put per hour which is only 1.95 times as compared to single feeder decorticator output.