

Research Paper :

Performance evaluation of bullock drawn seedrill for groundnut

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Accepted : September, 2009

ABSTRACT

Sowing is prime operation in cultivation practice of any crop which directly affects production. Therefore, timely sowing is necessary with available sources of power. To achieve these a prototype consisting of seed hopper, metering mechanism, power transmission unit, frame, furrow opener and beam for hitching arrangement was developed. The seed drill was tested for its performance of sowing groundnut variety SB-XI. It delivered desired seed rate of 36.8kg/ha during field testing and mechanical damage to the seed was found negligible *i.e.* 0.61%. The field capacity of the seed drill was 0.0612 ha/h at average operating speed of 2.4 km/h. The field efficiency of seed drill was 76.5% and average depth of seed placement was 55 mm, where the average seed spacing was 12 cm. The cost of drilling / planting with the help of this seed drill was estimated as Rs. 473.75 per ha. The saving of man-hour and cost of drilling / planting was quite substantial and justified with the use of seed drill.

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Key words : Groundnut, Bullock, Seed drill., Performance

India has 85 million of draft animal hence the further prospect of Indian farming largely depends upon the utilization of animal power through different matching implements in efficient work by accepting the ways of farm mechanization which helps in reducing the cost of cultivation or operation and time saving. Farm mechanization is necessary to increase production with less investment and less time of operation.

Sowing is a prime operation in cultivation practice of any crop. Sowing is an art of placing seeds in the soil to have good germination in the field, the perfect seedling gives;

- Correct amount of seed per unit area.
- Correct depth at which seed is placed in the soil.
- Correct spacing between row-to-row and plant-to-plant.

Seed drill or seed cum fertilizer drills (bullock drawn or tractor drawn) facilitate line sowing and proper application of seed and fertilizer in the field. Thus there is saving of 10-15% input.

The animal drawn dufan (two row), tifan (three row), and FESPO plow (all local sowing devices) have been adopted as these cover more area and costless. These however required skilled labour to regulate seed rate. For precise application of seed and fertilizer, mechanically metered seed drill and seed cum fertilizer drill, operated by animal and tractor have been developed and are being manufactured to suit specific crop and regions for sowing /planting of wheat, paddy, coarse cereals, pulse, oil seeds, maize and potato.

Groundnut (*Arachis hypogaea* L.) is a major cash

crop in India. In India, total area under this crop is about 61.41lakh ha. India ranks second in groundnut production. Average yield is about 4.08q/ha having 66,00,000 ton production. Groundnut production of India contributes about 19% of world production. (Indian Economic Survey, 2006). In India sowing of groundnut is carried out with four tyne seed drill (pabhar), tifan, or at some places by dibbling. But during sowing with seed drill and tifan only row spacing is maintained. To maintain plant-to-plant and row-to-row spacing dibbling method is generally employed, to increase groundnut production. It is necessary to maintain the correct plant-plant and row-row spacing. Sowing by dibbling is labour and time consuming.

A bullock drawn seed drill for ground nut was developed to minimize time and labours requirement. It was tested for performance.

METHODOLOGY

Development in the seed drill was made by changing the seed metering mechanism and provision of drive to the metering mechanism. The fabrication work was carried out in the workshop of Farm Machinery and Power Department, Aditya Agriculture Engineering and Technology College, Beed. Developed seed drill was evaluated as per RNAM test code in which laboratory and field test are carried out.

Seed drill as shown in Fig. 1 mainly consists of following functional units;

Seed metering hopper with bottom plate:

This unit consisted two plates, one as bottom plate