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Development of shaking and pod exposing attachments for tractor drawn groundnut digger

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ABSTRACT

Harvesting of groundnut is a labour consuming, expensive and tedious operation. The farmers required to repeat the operation of harrowing several times to expose detached and left out pods. Therefore, this operation requires more time, labour and energy, which ultimately increase in the cost of crop production. Hence, the shaking and pod exposing attachments were developed and attachments were tested for its performance in the medium black soil for semi spreading variety of groundnut. The test results for digging and exposing indicated that the average draft requirement was 782 kg and 691 kg with an average speed of 3.79 km/h and 4.28 km/h, respectively. The average effective field capacity and field efficiency in case of digger shaker were 0.35 ha/h and 80.10 per cent while for the pod exposure it was 0.41 ha/h and 81.33 per cent, respectively. The average digging efficiency of digger shaker was 90 per cent and the pod exposing efficiency of pod exposure was 93.28 per cent. The fuel consumption was found to be in the range of 3.7 to 4.14 l/h.

Key words : Development, Pod shaking, Pod exposing, Tractor drawn groundnut digger

INTRODUCTION

Harvesting of groundnut (*Arachis hypogaea* L.) or peanut crop consists of removal of the groundnut plants along with the pods from soil. Generally farmers, in India, are using bullock drawn blade harrow, improved blade harrow and tractor drawn blade harrow for harvesting of spreading variety of groundnut (Gadir and Ahmad, 2001; Garg and Verma, 1900; Gupta *et al.*, 2002). Improper penetration of blade due to clogging with vines and working under hard soil is common problems faced in above said implements during the operation, resulting in more per cent of pods left out in the field. The farmer is required to repeat the operation of harrowing several times to expose detached and left out pods. Therefore, this operation requires more time, more labour and power, which ultimately increase the cost of crop production. Hence, the investigation on development of shaking and pod exposing attachments for tractor drawn groundnut digger was carried out at Department of Farm Machinery and Power, College of Agricultural Engineering and Technology, Junagadh in 2005.

MATERIALS AND METHODS

Developed attachments consisted of shaking

attachment, gearbox assembly, crank arrangement and pod exposing attachment.

Shaking attachment:

Shaking attachment consisted of square bars, round bars and lifting rods. Two MS square bars of size 25 × 25 mm having length of 600 mm were rounded on both the side with the help of lathe machine in such a way that they can be fitted in between three tynes with the help of bushes and oscillate. On either side of blade three pieces of 20 mm MS round bar each having 300 mm length and 20 mm diameter were taken and at one end of each round bars outer threading was provided so that it can be tightened with holes in square bar. On the each square bar seven lifting rods were fitted above the round bars with help of nuts, which were made from 20 mm diameter of conduit pipe. The lengths of lifting rods were ranged in between 600 to 400 mm. These lifting rods were bolted on square bars at 70 mm spacing with help of nuts so that during exposing it can be removed and pod exposing attachment can be fitted with the help of same nut bolts. The lifting rods were bended downward at rear end with the help of suitable fixture so that a groundnut plant after digging passes backward easily. The 20 mm diameter of MS round bar was laterally attached to lifting rods in such a way

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