

Study of Farm Mechanization Gaps in the Cultivation of Cotton Crop

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Abstract— A survey was carried out in Akola district for finding out the farm mechanization gaps in cultivation of cotton crop. Initially structured questionnaire was prepared to assess the level of mechanization of different farm operations in the cultivation of cotton crop. The main aspire of the study was to make out farm tool / machinery requisite to be urbanized for cotton cultivation. With the help of questionnaire, 175 farmers cultivating cotton were personally interviewed in seven Tahsils of Akola district. Out of total farmer contacted 80 per cent farmer are under rain fed area, remaining 20 per cent farmers used electric motor for irrigation. No use of diesel engine was reported. Out of total farmer contacted 26 per cent of the farmers asked for cotton picking machine. About 11 per cent were demanding for cotton uprooting machine, 14 per cent were demanding for bullock drawn planter, 2 per cent for weeding machine and remaining 47 per cent have expressed the satisfaction about quality of work of implements possessed by them.

Keywords— Survey, farm implements, mechanization, farmer demand.

I. INTRODUCTION

In general sense farm mechanization is the process through which agricultural activities can be improved in cost effective manner to achieve optimum crop production. Application of machines in agricultural sector is considered to be outstanding developments in agriculture (Yohanna, 2004). Some of the scenarios of increased production that has been observed must be accredited to the increased utilization of non-human energy and of more effective machines and implements (Kepner *et al.* 1978).

Around 65% population of India depends on agriculture directly or indirectly for their livelihood. Small landholding, land fragmentation and non availability of farm labours are the main driving forces due to which farmers are willing to mechanize their agricultural activities and which led to considerable increase in farm mechanisation in past few decades. Some of the studies on farm mechanization revealed that if the mechanization followed properly a farmer can save 15-20% of seeds, 20-30% of fertilizer, 20-30% of time 2-5-20% of labours with increase in cropping intensity in the tune of 10-15 per cent, higher productivity around 15-20 per cent (Nagraj *et al.* 2013). During the years 1960- 61, the animal power contributed 92 per cent of the total farm power whereas mechanical and electrical together contributed 8 per cent. However, as paradigm shift, in 2004-05 the contribution from

animal power considerably reduced to 16 per cent and from mechanical and electrical power, it increased to 84 per cent (Nagraj *et al.* 2013). Farm mechanisation has played pivotal role in growth and development of agricultural sector in the Vidarbha region of Maharashtra state.

Cotton is the king of all cash crops. It is also known as white gold because of its high market value. In Akola district, cotton is essentially grown as kharif crop. The irrigated crop is sown in May and rain fed crop in June-July with the commencement of monsoon. Total land under cultivation in Akola district is about 2,25,955 ha, out of which only about 0.60 lakh ha is under irrigated cotton. The productivity of cotton in Akola district is 90-100 kg/ha. The reasons for low productivity have been reported as lack of irrigation facilities, poor control of insect pest and diseases and lack of mechanization. These small farmers are still dependent on traditional animal operated small capacity farming implements. The only way to improve this condition is by improving the existing implements for better and faster output. In the view of above aspects, this project was undertaken in Akola district.

II. METHODOLOGY

Survey of cotton growing farmers in Akola district constituted the main bustle in the methodology for the study. Initially a questionnaire was prepared for collecting the information in Akola district. The points like name of farmer and address, total area of land, type of tractor operated implement, labor charge, time for operation, type of implement, problem of implement etc. were included in questionnaire for survey. The survey was conducted in five villages of every Tahsil and in each village; five farmers were contacted personally for assortment of information in an interviewed. The data collected during the survey was analyzed to know the method of crop growing, implement possessed and used, rates of hiring etc.

III. RESULTS AND DISCUSSION

Utilization of Farm Implements in the Seed Bed Preparation for Cotton Crop

It was observed that the M. B. Plough, blade harrow and deshi plough are mostly use by the farmers for seed bed preparation. The custom hiring rate for seed bed preparation of

M.B. plough and blade harrow is Rs.1700/ha and Rs.700/ha respectively.

Sowing

The area in which the survey was conducted, the farmer use to follow the manual dibbling method of sowing for cotton crop. It was found that the field capacity of dibbling method is approximately 0.025 ha/h and that for bullock drawn seed drill the field capacity is 0.045 ha/h.

Interculturing

Interculturing is done both manually using khurpi and with animal drawn hoe. Tractor operated cultivator is not yet adopted by farmer for intercultural operation.

Spraying

Tractor drawn sprayers are not popular amongst the farmers in the surveyed area. Farmer are still using power sprayers and knapsack sprayers for spraying the crops. Farmer prefer power sprayers because of its higher field capacity.

Fertilizer Application

Manual method for fertilizer application is most common and widely followed by the farmers. According to their opinion, mechanical fertilizer application is costly compared to manual.

Irrigation

In Akola district, about 80% of cotton grown area is rainfed and the remaining 20% farmers used electric motor for irrigation. Farmer mostly used 3 hp electric motor for lifting water from the well. No use of diesel engine was found for irrigation purpose during survey.

Cotton Picking

Manual cotton picking is observed in surveyed area. The labour and time required was very high for this operation. As

this operation is very tedious, the farmers were asking for suitable cotton picking machine to be developed.

Transport of the Produce

It was found that 90% of the transportation is done with bullock cart and only 10% with the tractor trolley. The reason behind this is animals are cheaply available with the farmers.

Stalk Pulling

Manual method of stalk pulling by hand and with the help of fork (chimplta) is widely used the by the farmers. The farmer s rarely use tractor drawn V-blade for this purpose.

Implement Possessed by the Farmers

Implement possessed by farmer owning tractors were M.B.plough, cultivator, v-pass and trolley. The small farmer possessed deshi plough, blade hoe, seed drill and blade harrow operated by bullocks. Bullock drawn seed drill for wheat, Gram etc. tractor drawn cultivator for soil preparation as secondary operation.

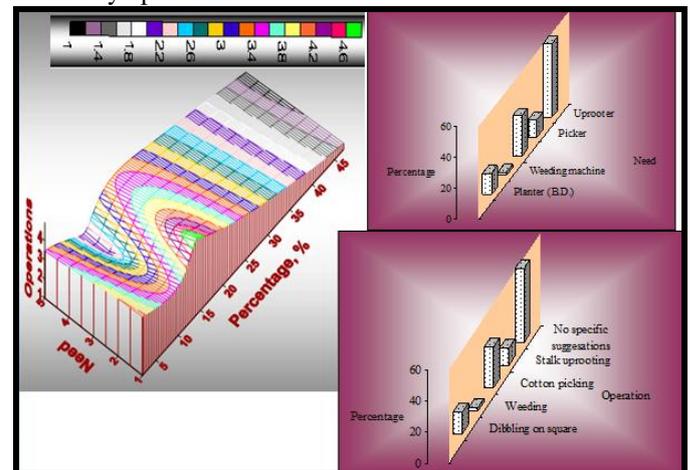


Fig. 1. Need of farm machinery for different operations for cotton crop.

TABLE I. Farm implements used for the cotton cultivation in Akola district.

Operation	Field Capacity, Ha/hr	Fuel Consumed l/hr	Man-hrs Required /ha	Rate for custom hire Rs/ha	Percent of Population Using
Land preparation					
M. B. plough (T.D.)	0.15	4	-	1700	-
Blade harrow (T.D.)	0.40	3	-	700	-
Sowing					
Dibbling	0.02	-	-	-	30
Drilling (B.D.)	0.05	-	-	-	70
Intercultural					
Hoe (B.D.)	0.06	-	-	-	50
Manual-Khurpi	-	-	200	-	50
Spraying					
Manual	0.06	-	15	-	40
Power	-	3-4	6	300	60
Fertilizer application					
Manual	-	-	70	-	100
Picking-Manual	-	-	40-50 per picking	4.00/kg	100
Transport					
Bullock cart	-	-	-	-	90
Tractor trolley	-	3	-	-	10
Irrigation					
Electric motor	-	-	-	-	100
Stalk pulling					
Manual	-	-	100	-	90
Mechanical	0.50	3	-	70	10

Suggestions of the Farmers Regarding the Operation Wise Need of New Implements Required

Out of total farmer contracted 26 per cent of the farmers asked for cotton picking machine. About 11 per cent were demanding for cotton uprooting machine, 14 per cent were demanding for planter (BD) 2 per cent for weeding machine and remaining 47 per cent was expressed the satisfaction about quality of work of implements possessed by them shown in figure 1.

IV. CONCLUSION

New implements demanded by 53 per cent Farmers for carried out the difficult operation under cotton crop remaining 47 per cent farmers were expressed the satisfaction about quality of work of implements possessed.

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