

## Adoption level of developed manually operated weeder

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### ABSTRACT

In India most of the weeding operation is done by *Khurpi*. Due to traditional method of weeding most of the agricultural workers suffer from postural discomfort which decreases the productivity and efficiency of workers. Weeding by manually operated weeder increases the productivity and efficiency of workers. Hence, the present investigation was undertaken with an objective to study the adoption level of developed manually operated weeder by agricultural women. The study was conducted in Nagpur, Amravati, Buldhana, Yawatmal, and Vashim districts of Vidarbha region in Maharashtra state during the year 2010-2011. For the present investigation 5 agriculture labours were selected randomly from 100 land holders of five districts, consisting of total agriculture labours 2500 in which 1500 were female labours and 1000 male were labours. Pre-structured questionnaire was used for data collection. Ergonomical and field performance evaluation of manually operated weeder was done on farmers field. After the evaluation of manually operated weeder farmers were given preferences in questionnaire.

### INTRODUCTION

Weeding is one of the most important farm operations in crop production system. Weed growth is a major problem for dry land crops particularly in oilseed crops like groundnut and mustard causing a considerable lower yield. As oilseeds constitute the second major agricultural crops in India next to food grains in terms of quantity and cost, it is necessary to mechanize different farm operations of this crop. India is the third largest producers of groundnut in the world and accounts for about one-fifth of world's production. In India this operation is mostly performed manually with *Khurpi* or trench hoe that requires higher labour input and also very tedious and time-consuming process. Moreover, the labour requirement for weeding depends on weed flora, weed intensity, time of weeding and soil moisture at the time of weeding and efficiency of worker. Often several weeding are necessary to keep the crop weed free. Reduction in yield due to weed alone is estimated to be 16-42 per cent depending on crop and location and involves 1/3 rd of the cost of cultivation (Rangasamy *et al.*, 1993). Weeding and hoeing are generally done 15-20 days after sowing. The weed should be controlled and eliminated at

their early stage. Depending upon the weed density, 20-30 per cent loss in grain yield is quite usual which might increase up to 80 per cent if adequate crop management practice is not observed. Rice and groundnut are very sensitive to weed competition in the early stage of growth and failure to control weeds in the first three weeks after seeding reduce the yield by 50 per cent (Gunasena and Arceo, 1981). Hence, the present investigation was undertaken with an objective to study the adoption level of developed manually operated weeder by agricultural women.

### METHODS

The present study was conducted in Nagpur, Amravati, Buldhana, Yawatmal, and Vashim districts of Vidarbha region in Maharashtra state during the year 2010-2011. For the present investigation, 5 agriculture labours were selected randomly from 100 land holders of five districts, total agriculture labours were 2500 consisting of 1500 female labours and 1000 male labours. Pre-structured questionnaire was used for data collection. Ergonomical and field performance evaluation of manually operated weeder was done on farmers field. After the

evaluation of manually operated weeder farmers were given preferences in questionnaire.

## OBSERVATIONS AND ANALYSIS

The findings of the present study as well as relevant discussion have been summarized under following heads:

### Age :

The information presented in Table 1 explores that majority of the form workers (69.60 %) were from middle age group followed by young age group (17.68 %) and 12.72 per cent from old age group.

Sr. No.	General information	Frequency	Percentage
1.	<b>Age</b>		
	Young (upto 30 yrs)	442	17.68
	Middle age (31-45 yrs)	1740	69.60
	Old age (46 yrs and above)	318	12.72
2.	<b>Sex</b>		
	Male	1000	40
	Female	1500	60
3.	<b>Education</b>		
	Illiterate	919	36.76
	Primary education	813	32.52
	Secondary education	295	11.80
	Higher Secondary education	301	12.04
	College level education	172	6.88
4.	<b>Type of work</b>		
	Farm work	1822	72.88
	Farm supervision	678	27.12
5.	<b>Traditional method of weeding</b>		
	Weeding by hand	498	19.92
	Weeding by <i>Khurpi</i>	1682	67.82
	Any other method	320	12.80
6.	<b>Time spend for weeding activity</b>		
	Up to 3 hrs	111	4.44
	3 – 5 hrs	898	35.92
	5 hrs and above	1491	59.64

### Sex :

Among total form workers, 40 per cent were male whereas 60 per cent were female selected for the present investigation.

### Education :

Perusal of the data given in Table 1 indicate that 36.76 per cent form workers were illiterate followed by 32.52 per cent form workers were having primary education, 11.80 per cent

secondary education while 12.04 per cent (higher secondary education) and 6.88 per cent were completed college level education.

### Type of work :

The information presented in Table 1 indicate that 72.88 per cent respondents were farm workers while 27.12 per cent respondents were farm supervisor.

### Traditional method of weeding :

Table revealed that 19.92 per cent form workers are doing weeding activity by hand while 67.82 per cent form workers are using *khurpi* for weeding purpose and 12.80 per cent respondents are doing weeding activity by any other method.

### Time spend for weeding activity :

It is evident from Table 1 that 4.44 per cent farm workers were performing weeding activity up to 3 hrs. whereas, 35.92 per cent form workers were doing weeding activity for 3-5 hrs. and 59.64 per cent form workers were doing weeding activity for 5 hrs and above.

This shows that majority of the workers were performing weeding activity for 5 hrs. and above time. That's why they suffered from poststural discomfort due to traditional method of weeding.

Table 2 shows that young age group and middle age group farm workers showed significant results for satisfaction regarding height of developed weeder (0.22\* and 0.22\*), weight of developed weeder (0.23\* and 0.21\*), grip of handles (0.34\*\* and 0.23\*), width of developed manual operated weeder (31\*\* and 22\*).

It was concluded that out of six independent variables *viz.*, annual income, land holding and type of land were the most important factors affecting the adoption of developed manually operated weeder for weeding practices. While independent variables namely age, education and type of work did not show any effect on adoption of developed manually operated weeder (Table 3). This may be due to peculiar situation in which formers are living.

Multiple regression analysis was worked to know the contribution of selected six independent variables with dependent variables *i.e.* adoption of developed manually operated weeder for weeding practices. Table 3 reveals that the value of  $R^2$  was 0.564. It is illustrated that 56.40 per cent of the variation in adoption was explained through the variables considered for regression equation. The t-value was found significant at 0.01 level of probability in respect of land holding, annual income and type of land. The unexplained variation was 43.60 per cent which may be due to extraneous factors.

Table 4 shows that 42.72 per cent of the respondents were having medium level of adoption of developed manually operated weeder whereas 7.2 per cent of them were having low

**Table 2 : Correlation of Independent Variables with satisfaction regarding developed manually operated weeder**

Satisfaction regarding independent variables	Height of developed weeder	Weight of developed weeder	Grip of handles	Width of developed weeder	Diameter of wheel
<b>Age</b>					
Young group	0.22**	0.23*	0.34**	0.31**	0.32**
Middle age group	0.22**	0.21*	0.23*	0.22*	0.24*
Old age group	0.19*	0.14 <sup>NS</sup>	0.28**	0.21*	0.27**
<b>Sex</b>					
Male	0.28**	0.21*	0.28**	0.23*	0.21*
Female	0.27**	0.32**	0.22**	0.25**	0.24*
<b>Area of land</b>					
Marginal form workers	0.21**	0.19*	0.24*	0.27**	0.21*
Small farm workers	0.22*	0.38**	0.21*	0.23*	0.22*
Medium form workers	0.28**	0.27**	0.28**	0.25**	0.20*
Big form workers	0.19*	0.18 <sup>NS</sup>	0.19*	0.22*	0.23*

\* and \*\* indicate significance of values at P=0.05 and 0.01 (=-0.19) and (=0.25), respectively  
NS = Non-significant

**Table 3 : Multiple regression analysis of adoption level of developed manually operated weeder**

Sr. No.	Variables	Regression coefficient r-value	S. E.	t-value
1.	Age	0.0063	0.0130	0.483
2.	Education	0.2116	0.1512	0.399
3.	Land holding	-0.0258	0.0100	2.584**
4.	Annual income	0.3049	0.542	5.623**
5.	Typed falork	-0.2513	0.2722	-0.923
6.	Type of land	0.5284	0.1063	4.969**

\* and \*\* indicate significance of values at P=0.05 and 0.01, respectively  
R<sup>2</sup> = 0.564 't' value = 20.14

**Table 4 : Distribution of respondents according o the adoption of developed manually operated, weeder (n=2500)**

Sr. No.	Category	Frequency	Percentage
1.	High	1252	50.80
2.	Medium	1068	42.72
3.	Low	180	7.2

level of adoption and 50.80 per cent were from high adoption category.

Table 4 concluded that most of the respondents were highly adopted developed manually operated weeder. Reason behind that the developed manually operated weeder had increased the efficiency of workers and productivity of work.

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