Performance and Evaluation of Manually Operated Weeding Tool Khurpi

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Abstract -- A field experiment was conducted on manually weeding tool khurpi in the farm of college of technology and engineering (CTAE), Udaipur during the rabi season of 2015-16. Soil type of the experimental land was sandy loam. Bulk density, moisture content of soil at the time weeding operation was recorded using 'digital moisture meter'. Bulk density and moisture was recorded from each plot. Core sampler is used to measure bulk density. Cone index was recorded after the weeding operation using cone penetrometers. We use the average values for the results. Weeding efficiency was 94.8 per cent, plant damage percentage was 0.01 and field efficiency was 98.1 per cent of khurpi.

Indexed Terms: cone Moisture content, Field capacity, Plant population digital moisture meter' cone penetrometer

I. INTRODUCTION

Weeds - Unwanted plants which grow in a field with cultivated crop, competing with the crop for plant nutrients may be termed as weed. Weeding - Weeding consists of removal and disposal of unwanted plants which grows in field with cultivated crop competing with crops for moisture and nutrients.

II. METHOD OF WEEDING

1. Mechanical method
2. Crop competition
3. Crop rotation
4. Biological method
5. Chemical method

From the above mentioned methods mechanical method for eradicating weed is commonly used. Wide verities of weeding hand tools are used. The shape and size of these tools vary from one part of country to parts and from region to region. It is the cheapest and has higher efficiency than other methods. Indigenous method of weeding adopted in region is Khurpi which is much arduous and consume much labor hour. During the peak season when there is dearth of labor indigenous method is not successful. Certain modified manual and animal drawn weeders are also used. These methods have higher efficiency and lower economics. The human and bullock hour requirement are reduced substantially with the use if tool carrier ensuring less time of farm operation. Maize is a important cereal crop in many developed and developing countries of the world. Area and production of maize ranks third in world in world crop production (380 million tons from 120 million hectares) following wheat (440 million tonnes from 240 million hectares) and rice (420 million tonnes from 140 million hectares). This represents 24% of the maize production as compared to 27% for wheat and 25% for rice. It is widely used for animal feed and industrial raw material in the developed countries where as the developing countries use it generally for animal feed. India occupies fifth place on an average under maize in the world, the first four being USA, Brazil, China and Mexico respectively and ranks tenth in production. In Indian agriculture, maize occupies a prominent position and each part of the maize plants is put to one or the other use and nothing goes to waste. Among the cereal crops in India, maize with the annual production of around 10 million tonnes covering 6 million hectares in area being next to rice, wheat, sorghum(jowar) and Millet(bajara), in production whereas in productivity it ranks at third position(Anonymous,2003 a). In Punjab the area under maize in the state is 129 thousand hectares with a production of 475 thousand tones. The average yield during 2012-2013 was 3.68 t/ha (Anonymous 2014). Maize crop residues have great significance, particularly in developing countries, where the harvest of corn Stover and their natural drying is widely applied. After drying these are available for energetic use on farmers' yards and can be used as a potential bio fuel.

III. MATERIALS AND METHODS

- Site Selection:

Maize crop was selected for weeding. The total area of the field was 0.70ha. Out of this selected each field area was 15mX10 m Weeding tools selected Khurpi.

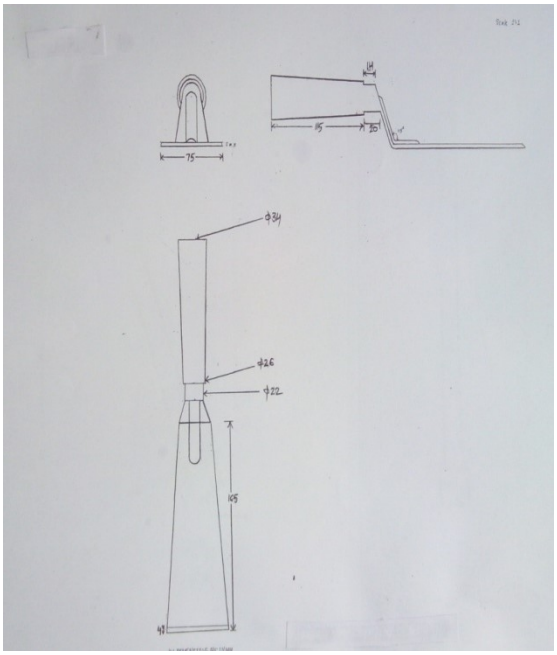

Fig. 1: Schematic Diagram of khurpi

IV. RESULT

Average values of results when using khurpi for weeding operation in maize crop

S. No.	OBSERVATIONS	UNIT	READINGS
1	Duration	H	11.41
2	Total stoppage time	H	2.618
3	Net working time	H	8.794
4	Avg. Speed	Kmph	0.2323
5	Avg. Depth of cut	Cm	6.98
6	Avg. Width of cut	Cm	7.5
7	Actual area covered	ha/day	0.013648
8	Theo. area covered	ha/day	0.013912
9	Time required	day/ha	71.88
10	Field efficiency	Per cent	98.1
11	Population of weed in 1 m2 area Before After		660.67 34.33
12	Weeding efficiency	Per cent	94.80
13	Soil moisture	Per cent	26.55
14	Row to row spacing	Cm	60
15	Plant damage	Per cent	0.01

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