

Research Paper :

Development of 'V' blade harrow

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ABSTRACT

Efforts are made to develop a tractor drawn 'V' blade harrow at AICRPDA, Solapur Centre. The developed harrow consists of a frame of mild steel and a 'V' shape blade fitted to the frame. The blade is strong and made up of high carbon steel. Due to its 'V' shape it enters easily in the soil. It can be operated by 35 or more H.P. tractor. Field trials were conducted over 20 ha area. The effective field capacity, field efficiency and cost of operation were 0.46 ha/hr, 95% and 416/- Rs./ha, respectively. There was 40 % saving in labour cost than the traditional method. Field coverage and field efficiency was 40 % and 3.78 % more than the traditional method. It removes 95 % weeds. It gives a more desirable tilth in one operation and can replace the conventional practice of 2-3 harrowing and mould board plough once in three years in dryland region. This 'V' blade harrow is found useful for removing weeds and grasses, clod crushing, uprooting and breaking the stubbles.

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Key words : 'V' Blade harrow, Field capacity, Field efficiency

Tillage is defined as mechanical soil stirring actions carried out for the purpose of nurturing crops. The goal of proper tillage is to provide a suitable environment for seed germination, smooth growth, weed control, soil erosion control and moisture control avoiding moisture excess and reducing stress of moisture storage (Pandey *et al.*, 1997). The equipment requirement for conservation tillage varies depending on which type of system is used. Some systems depend primarily on mechanized equipment, while others are also adaptable to animal drawn hand operated equipment. (Indrakumar, 2003). Vertisol in dryland region of Solapur shrinks faster and are very hard to till during off season. The climatic conditions and rainfall pattern suits most growing *rabi* sorghum with either *kharif* fallow or growing short duration pulses in *kharif* condition before sowing *rabi* sorghum. Traditionally, ploughing with mould board is done once in three years, helps to uproot the perennial weeds and to invert the soil. Repeated blade harrowing occasional and deep ploughing not only increase the input energy and cost but also involves the drudgery. Timeliness of operation, precision and reduction of operational cost are the key factors in improving productivity and profitability of rainfed farms. Human and animal resources in these areas are continuously dwindling leading to deficit farm power availability during peak season and unusual increase in cost of operation. Conventional tools and equipments are no longer adequate to meet the needs of precision rainfed agriculture (Mayande *et al.*, 1996). In dryland agriculture ploughing is done once in three years, for land

preparation after harvest of dryland crops like pigeon pea, sorghum, pearl millet, maize etc. There was need of tractor drawn multipurpose implement which could do the work of tilling, pulverization of soil, loosening the soil in addition to harrowing operation and to meet the requirement of conservation tillage. In view of this a tractor drawn 'V' blade harrow was developed at All India Co-ordinated Research Project for Dryland Agriculture, Solapur Centre.

METHODOLOGY

Constructional details:

The details of various components of the developed the 'V' blade harrow are seen in Fig.3. The 'V' blade harrow consists of following major components.

- Main frame
- 'V' blade
- Mounting assembly
- Blade attachment to frame

Main frame:

Main frame is made of rectangular M.S. channel 100 mm x 100 mm x 6 mm size welded together. The other components like 'V' blade, three point hitch mechanism are attached to this frame. (Fig.3)

'V' blade:

This is the main component of the implement. It is made up of high carbon steel. The shape of the blade is like English 'V' letter having angle of 50° between two sides (Fig.3). Provision is made to adjust the angle of