

CAD CAM modeling of twin wheel hand hoe

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■ **ABSTRACT** : Twin wheel hand hoe is an intercultural tillage implement which is used in arable field and garden. Twin wheel hand hoe has a huge capacity for controlling weed and intercultural preparation. Additionally twin wheel hand hoe has a capacity to aerate the soil. Direct weeding of row crop in puddle soil, alternative to weeding offers the advantage of faster and easier operation with reduce labour and therefore, results into higher work rate. Manual hand weeder developed by researchers are been popularized to address the issue of the timeliness and reducing drudgery in manual operation to proved an alternative to cutting of weed the design and development of blade type cutting mechanism was taken up. The drawings of various components and assemblies of twin wheel hand hoe were prepared utilizing CAD CAM facilities and fabrications of component were done as per the drawing in the researcher work. The field studies were conducted with different thrust on weeder. The variation in weed cutting rate depended on quantity of weeds in the field, thrust on weeder, water holding capacity of soil etc.

■ **KEY WORDS** : CAD, CAM, Twin wheel hand hoe, Weeding

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Small and marginal farmers faced problems of high hiring charges as well as timely availability of bullock pair for hoeing. Farm women of these families are being used the bullock drawn hoeing equipment with their hands as bullock pair was not available in time on hiring basis. But the drudgery of using bullock drawn hoeing equipment by women was too severe and the pain experienced by farmwomen was too much. twin wheel hand hoe is an intercultural tillage implement which is used in arable field and garden in agriculture. twin wheel hand hoe has a huge capacity for controlling weed and intercultural preparation. Additionally twin wheel hand hoe has a capacity to aerate soil.

In this background, twin wheel hoe (TWHH) weeder from the Central Institute of Agricultural Engineering (CIAE) demonstrated in farmers fields during 2003-04. Based on the feedback from farm women, twin wheel hoe weeder was refined by changing the blade from "V" shape (1200) in 3 sizes viz., 9", 10" and 12" to suit to inter row space of crops such as green gram, groundnut, onion etc which are sown in different row spacing as well as to reduce pain in shoulders of farm women during 2004-05. Refined twin wheel hoe weeder was popularized through frontline demonstrations, extension activities and also publishing article in newspaper. As per the demand, procured 270 twin wheel hoe weeders from CIAE and refined them as said above and supplied to farm women and

farmers from other districts like Tumakur, Hasan, Chikkamangalore, Bellary, Gangavati, Bangalore etc. who visited KVK. Data collected from 93 farm women who are using refined twin wheel hoe weeder for the past 3-4 years indicated that the labour requirement per ha for hoeing with bullocks and hand weeding was 28, 46, 18, 18 and 81 labours in green gram, groundnut, *Rabi* jowar, Bengalgram and onion crops where as with refined twin wheel hoe weeder and hand weeding, it was 15, 30, 16, 16 and 48 labours and saves Rs1080, Rs 1560, Rs 720, Rs 720, and Rs 2580 per ha, respectively. In addition farm women expressed that timeliness in weeding and hoeing operation is possible only by using refined twin wheel hoe weeder which otherwise is not possible in hoeing with bullocks.

In the light of the above, a project work was undertaken with the following objectives:

-To prepare the dimensioning views of twin wheel hand hoe, to generate 2D modeling drawing of twin wheel hand hoe in Auto CAD-2010 and to create the geometric solid model of twin wheel hand hoe in CATIA V₅R₁₇

■ METHODOLOGY

The methodology consisted of CAD CAM design of twin wheel hand hoe. The specification of TWHH is given in Table A.