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RESEARCH ARTICLE :

Modifications in serrated sickle for increasing field capacity and reducing drudgery

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SUMMARY : The Vaibhav Sickle developed by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli was modified based on users feedback, anthropometric data and available scientific literature. The cutting surface length, chord length of available Vaibhav sickle was 200 and 180 mm respectively, hence the CS/CL ratio was 1.11. The blade concavity was 39. The average diameter and length of the handle were 32 mm and 136 mm, respectively. The angle of blade with handle was 130 deg. In modified Vaibhav sickle, the cutting surface length, chord length were 225 mm and 210 mm, respectively, hence the CS/CL ratio was 1:07 and blade concavity was 30. The effective serration pitch and angle between blade and handle were 0.2 cm and 160 deg, for both sickles. The comparative ergonomic evaluation of existing and modified sickles was carried out. The field capacity of improved Vaibhav sickle was found to be 112 m^2/h which was 13.1 per cent higher than existing Vaibhav sickle (99 m^2/h). The working heart rates of female workers while using improved and existing Vaibhav sickles were 120.3 and 128.5 beats/min, respectively while the work pulse for those sickles were 36.15 and 46 beats/min. The center of mass was located at distance of 7.3 cm away from the line of action in case of Vaibhav sickle and in case of improved sickle it was located very close to the line of action. This improved the balance of sickle and there is no lateral twisting to the wrist. The performance of improved Vaibhav sickle is better in terms of its field capacity, ergonomic design and balancing.

KEY WORDS :
Serrated sickle, Drudgery

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