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RESEARCH ARTICLE :

Testing of agriculture hand tool design using ergonomics principles

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SUMMARY : In India, women play an important role in agricultural field operations. Women are found to involved labour intensive activity on field, but still no specific tools and technologies are developed and tested on women to reduce their drudgery experiences in crop production activities. By keeping all these point, the present study was conducted to evaluate the carrot production system by improving some tools for work. The study was conducted on 30 farmers (43.3 % male and 56.7 % female) of Behbalpur village of Hisar district, who were found to be engaged in carrot production system. Majority of the respondents (60.0%) were belonged to the age group of 32-42 years and one third of the respondents (33.3%) were having education up to high school. Maximum respondents (93.3 %) were having farming as main occupation and majority of them (86.7%) were having land between 2.5-10.0 acres. Out of 14 carrot production these activities; harvesting was found to be most time taking activity with time involvement of 3602.6±52.8 minutes, followed by separating green from carrot (3043.7±45.1), irrigation (2672.4±21.5 minutes) and weeding (2411.3±23.1 minutes). Rating of perceived exertion score was also found to high in harvesting (x=4.7) packing/loading (x=4.2) and weeding (x=4.1). Results unveiled that most of drudgery prone activities were performed by female like; weeding (DI-83.67), separating green (DI-70.67), harvesting, (DI-69.33) packing and loading (DI-56.33) and collecting carrot (DI-55.67) with their drudgery rank of I, II, V,VI, respectively. So tools used in carrots production (especially weeding, collecting carrot, and separating green, packing/loading) were modified and their performance and acceptance level were tested on the bases of scales. As per result on effect of improved tools, heart rate and blood pressure (systolic-122.9±8.4 to 128.4 bp/min and diastolic-79.3±8.3 to 85.7±8.3 bp/min) of workers in weeding activity was found significantly higher (t value 3.07, 3.7 and 3.84) in tradition method but in improved tool the heart rate and blood pressure were near to normal value, which reflect that improved tool (hand wheel hoe) was easy to use and not affected the heart rate of workers. Grip strength of workers was found to be decreased (30.9±3.5 to 24.1±2.8) in tradition method but had not significantly affect (30.9±3.5 to 28.1±3.1) the workers grip strength by using hand wheel hoe.

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