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Performance evaluation of a modified offset rotavator in Guava orchard

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■ **ABSTRACT :** Rotary tillage implements are now projected as important tillage machinery for better seedbed preparation; however, the ordinary rotavator being in line with the tractor center line at the rear cannot be used in orchards due to the hindrance posed by narrow space between the plants. Therefore, the concept of a modified offset rotavator was proposed, which could perform intercultural operation between the plants. The study was conducted to evaluate the performance of the modified offset rotavator in guava orchard of Horticulture Research Center, Pantnagar. It was found that the draft (negative) for the L-shaped blades increased (1203.4 to 1841.4 N) as the forward speed increased (2.0 to 3.0 km/h) with Increase in depth of cut (80 to 120 mm) for the shield kept in the lowered (down) position and fuel consumption was higher 9.93 l/h at given forward speed 3.0 km/h with 120 mm depth of cut. Soil break up (mean mass diameter) resulting from the Impact action of L-shaped blades on soil was found increased (1.05 to 1.95 mm) as the forward speed increased (2.0 to 3.0 km/h). The extent of residue incorporation was the maximum 97.30 % at forward speed 2.0 km/h with 120 mm depth of cut, whereas at higher forward speed 3.0 km/h, field performance index was observed 88.28 %. The minimum area uncovered near the girth was reported 0.143 m^2 at higher girth 0.48 m while plant injury at 3.0 km/h resulted due to impact of sensing assembly with plants was found 50 % in form of scratch on the girth.

■ **KEY WORDS :** Tillage, Modified offset rotavator, Field performance, Guava orchard

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