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Response and economics of intercultural hand tools on growth and yield of onion under drip system of irrigation

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Abstract **:** The present investigations revealed that response of newly developed intercultural CAET-hand tools, hoes, traditional intercultural tool and modern weeder on a growth, yield and benefit cost ratio, with the constant level of irrigation and fertilizers used on onion crop. Under this experiment two intercultural hand tools and hand hoe were designed, fabricated and compared with the response of traditional equipment and modern weeder in onion cultivation. By utilizing these tools it was found that there was increase in labour use efficiency, saving in labour cost and increase production and productivity of onion crop. These tools performed batter intercultural operations, good aeration into the soil and also saved labour and irrigation supply. In this experiment drip irrigation provided an efficient method of fertilizer delivery and allowed precise timing and uniform distribution of nutrients. Fertilizer application through drip irrigation (fertigation) can reduce fertilize dozes and minimize ground water pollution due to fertilizer leaching from excessive irrigation. Fertigation events can be scheduled as often as irrigation upto several times per season. It was observed that the highest mean marketable yield in treatment T_3 (76.44 kg/ha) while in treatment T_2, T_1 and T_4 was obtained to be 61.86 kg/ ha, 55.67 kg/ ha and 55.57 kg/ ha, respectively when CAET hand tool, hoe, modern weeder as well as traditional hand tools were used in intercultural operation of onion crop as shown in Table 1, the benefit cost ratio of onion crop has been found highest in treatment T_3 (3.60:1) with respect to treatment T_2, T_4 and T_1 (2.80:1, 2.70:1, 2.45:1), respectively, as shown in Table 2. It is also observed that net return, and gross revenue were maximum in treatment T_3 inspite of treatment T_2, T_4 and T_1 which was minimum as shown in Table 3.

Key words **:** Intercultural tool, Hoes, Weeder, Fertigation, Benefit cost ratio

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In India more than 70 per cent of farmers serving on agricultural farming. Our economics is based on agricultural production because most of the farmer worked as hired labour who are receiving 50 per cent or more income from agricultural operations during the year. A large farmers have a tendency to employ a labour to the points whose marginal productivity is equal to the prevailing wage rate. The present study is based on design and fabrication of intercultural CAET- hand tool, hoe, modern weeder which was compared the performance with traditional equipment for intercultural operations in onion crop at CAET- farm, Etawah. By utilizing hand tools and hoe to increase labour use efficiency and aeration in intercultural operation after transplanting till harvesting of crop. Under this experiment 16 plots of 6m x 2m size each with a total area of experimental plots was 192m², with a constant level of irrigation and fertigation. Vedecke (1993) conducted an experiment on effect of irrigation for the yield and quality of strawberry on various suction of pressure and recommended that quality of fruits was better with increase in irrigation rate. Sivanappan *et al.* (1994) carried out experiment on water requirement and response of drip and other methods of irrigation on chilli crop and found saving of water was 62 per cent, increase in yield was 25 per cent and also 50 per cent of lesser infestation of weeds in drip irrigation method. Rajput and Patel (2002) conducted an experiment of drip irrigation on various fruits and vegetable crops and observed that an increase in yield and better crop growth under drip system of irrigating rather than traditional method of irrigation. They also observed that crop coefficient of dry onion and green onions were 0.90 and 0.80, respectively. Paul and Paul (2002) studied the response and economics of strawberry cultivation under drip irrigation