Comparative study for performances of various weeding tools and equipment in maize and green gram fields

P M S Jayathilaka
Farm Mechanization Research Centre (FMRC), Maha Illuppallama

The mammoty being a versatile equipment, is traditionally used to control weeds in many agricultural and horticultural crops in Sri Lanka. However, various manually operated equipment such as swiss hoe, three tine cultivator, mulch weeder and wheel hoe have been developed to do specific weeding operations more efficiently than the mammoty. However, they have not gained popularity among farmers. Therefore, the Farm Mechanization Research Centre (FMRC) conducted evaluation tests for them in row seeded green gram and maize fields during the period of *maha* and *yala* seasons in 2004. The rotary tiller mounted to two-wheel tractor was also tested as an inter cultivator in maize crop. Test was done 18 days after planting of maize and green gram in the field.

The parameters, such as weeding index, crop plant damage, field capacity, labour requirement and performance index of equipment were measured and compared.The weeding index is the ratio between the number of weeds removed by a weeder to the number weeds present in a unit area. Performance Index is a measurement of performance of a weeder and is directly proportional to the field capacity, the weeding index and the quality of work (100 - crop plants damage %) and inversely to the power required. Field capacity is a function of the rated width of the equipment, the % of rated width actually utilized, the speed of travel and the amount of field time lost during the operation. The parameters were analyzed using multivariate analysis of variance (MANOVA).

The results showed that it was difficult to select the best equipment to satisfy all the parameters tested. Each equipment has its own advantages and disadvantages over the other. The mammoty recorded the highest weeding index but its field capacity was the lowest. The mulch weeder showed the highest performance index having a greater field capacity and more or less same weeding index to the mammoty. But plant damage was greater than that of the other equipments. The mulch weeder and the wheel hoe could be identified as efficient weeding equipments because they had better overall performances when compared to the other manual weeders. The three-tine cultivator was not attractive as a weeder because it had the lowest weeding index. Swiss hoe did not show significant advantages compared to others. The rotary tiller mounted to two-wheel tractor is a suitable inter-cultivator for medium size fields, but its weeding performance remained low.