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Effect of crop weed competition on the performance of direct seeded onion (*Allium cepa* L.)

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ABSTRACT

An experiment was conducted to investigate the critical period of crop – weed competition and efficient weed control measures to obtain higher bulb yield in direct seeded onion. The trial consisted of five weed free, five weedy treatments and each of weedy check and weed free check treatments, laid out in randomised block design with three replications. Maximum bulb yield (160.58 q ha^{-1}) was achieved by maintaining weed free condition upto 60 days after sowing and further weed free condition did not increase the yield significantly. The increase in yield was due to more number of leaves (6.45 plant^{-1}), plant dry weight (4.78 g plant^{-1}) and yield components like bulb diameter (4.92 cm) with more per cent of large and medium sized bulbs. The most critical period of crop weed competition was between 20 to 55 DAS.

Key words : Onion, Bulb yield, Bulb diameter, Crop–weed competition, Weed index

INTRODUCTION

In the development of a crop there is a critical stage at which the competitive ability of the crop is low and the presence of weeds will reduce the yield considerably. The critical period of crop-weed competition varies from crop to crop, variety to variety, method of establishment of crop and crop growth in the initial stages. The yield reduction is as high as 78 per cent in direct seeded onion (Westra *et al*., 1990). Hence, elimination of competition by weeds during the critical period would help the crop to grow well and consequently yield better. Therefore, it is imperative to determine the critical period of crop-weed competition in direct seeded onion so as to obtain maximum benefits from effective weed management practices and also to manage the weeds most efficiently and effectively. An investigation to determine the critical period of crop – weed competition and efficient weed control methods to obtain higher yields in direct seeded onion was taken up.

MATERIALS AND METHODS

The experiment was conducted in the farmer field at Kurlahally village of Chickballapur Taluk in Kolar District of Karnataka State during *rabi* - summer seasons of 1997-98 and 1998-99. The soil of the experimental site was sandy loam in texture and moderate in fertility. The soil was neutral in reaction and was high in organic matter, low in nitrogen, medium in available phosphorus and low in available potassium. The experiment consisted of five weed free, five weedy treatments and each of weedy check and weed free check treatments, laid out in randomised block design with three replications. The data on weed count and weed dry weight was subjected to square root transformation using the formula $\sqrt{X+0.5}$. The onion variety used was "Bangalore rose". The colour of the bulb is dark red with high pungency and the small bulb size.

RESULTS AND DISCUSSION

The important weed species observed in the experimental field consisted of grassy weeds such as, *Eragrostis ciliensis* L., *Dactyloctenium aegyptium* L., *Dicanthium annulatum* L., *Digitaria mariginata* L., and *Cynodon dactylon* L. Among broad leaved weed species *Galensoga parviflora* L., *Cenebra didyma* L., *Amaranthus viridis* L., *Oxalis latifolia* H.B. and K., *Phyllanthus niruri* L., *Ageratum conyzoides* L., *Euphorbia hirta* L., *Portulaca oleracea* L., *Lactuca runcinata* L., *Commelina benghalensis* L., *Parthenthium hysterophorus* L., *Euphorbia geniculata* L., *Argimone mexicana* L., *Lagasca mollis* L., and *Acanthospermum hispidum* L., were predominant and among sedges *Cyperus rotundus* L., and *Cyperus flageratus* L. were observed.

Total weed population and dry weight differed significantly among different treatments due to weed free and weedy treatments (Table 1). At 15 DAS, weed free period treatments recorded zero total weed population and dry weight. Among weedy period treatments total weed population ranged from 27.83 to 33.33 m^{-2} and 3.55 to 3.75 g m^{-2}.

At 30 DAS, weed free periods upto 30, 45, 60, 75 DAS and weed free check and weedy upto 15 DAS resulted in significantly lowest total weed population (0.00 m^{-2}) and dry weight (0.00 g m^{-2}). At 45 DAS, significantly lowest total weed population (0.00 m^{-2}) and dry weight

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