ABSTRACT

Weeds are a major barrier to crop productivity in agriculture. In big onion (*Allium cepa* L.) weed competition results considerably higher yield loss than other field crops due to short stature, non-branching habit, sparse foliage and extremely slow growth in initial stages. Therefore, onion must be maintained weed free for a long period to avoid yield reduction. Controlling weeds based on Critical Period for Weed Control (CPWC) is the most appropriate, economical and environmentally sound way to optimize weed control applications. The present study was conducted at two locations in two agro-ecological zones DL_{1b} and DL_5 of Sri Lanka during Maha (2014/2015) and Yala (2015) seasons. The treatments consisted two different periods of weed interference a critical weed free period and a critical time of weed removal with a weedy and weed free plots. Numbers of bulbs, fresh and dry weight of bulbs were recorded at harvesting. The CPWC was determined by fitting Logistic and Gompertz non-linear equations to relative yield loss data. Four acceptable yield loss levels (5, 10, 15 and 20%) were considered. The CPWC of big onion in DL_5 zone during Maha season was 15-100, 18-62, 20-54 and 22-49 days after transplanting (DAT) for acceptable yield loss levels respectively. Meanwhile, 9-68, 12-60, 15-54 and 18-49 DAT were observed as CPWC in DL_{1b} zone during Yala season. These results revealed that weed is a serious threat to onion cultivations in both DL_{1b} and DL_5 zones and fields should be kept in weed free for much of the growing season to reduce considerable yield reduction. However, these periods varied according to weed densities, agronomic practices and climatic conditions.

Key words: Big onion, Critical Period for Weed Control, Weed Competition, Yield loss