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Effect of soil solarization, herbicides and cultural practices on weed control and seedling growth in chilli (*Capsicum annum* L.) nursery

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SUMMARY

An experiment was conducted during 2006 on loamy sand soil of Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar to study "Effect of soil solarization, herbicides and cultural practices on weed control and seedling growth in chilli (Capsicum annum L.) nursery". Treatments consisted of soil solarization (SS) with TPE (0.025 mm and 0.050 mm) and BPE (0.125 mm) for 30 days in conjunction with one hand weeding at 20 DAS; Pendimethalin @ 0.5 kg ha^{-1}. Fluchloralin @ 0.5 kg ha^{-1}, Rabbing with bajara husk @ 6 kg m^{-2}. Pre – sowing irrigation followed by cultivation (stale cultivation), Weed free and Weedy check as control were studied in Randomized Block Design with four replications. Weed free treatment showed significant effect with recording lower number of weeds, dry weight of weeds and higher weed control efficiency. The other two best treatments were SS with 0.025 mm TPE for 30 days with one hand weeding at 20 DAS which recorded higher soil temperature at both 15 days interval at 5 and 10 cm depths of soil and rabbing. The higher plant height (25 and 35 DAS) was observed in rabbing followed by SS with 0.025 mm TPE for 30 days with one hand weeding at 20 days. The higher root length (15 and 35 DAS) and maximum number of transplantable chilli seedlings at first pulling were recorded in SS with 0.025 mm TPE for 30 days with one hand weeding at 20 DAS. Rabbing had given the highest net realization of Rs. 7,86,179 ha^{-1} with BCR of 4.27, next in line was SS with 0.025 mm TPE for 30 days with one hand weeding at 20 DAS recorded net realization of Rs. 7,85,271 ha^{-1} with BCR of 4.12. Based on the results, it can be indicated that the treatment of rabbing and soil solarization with 0.025 mm TPE for 30 days with one hand weeding at 20 DAS effectively controlled weeds and produced higher number of transplantable chilli seedlings and higher net realization.

Key words :

Chilli (*Capsicum annum* L.) being a rainy season crop is seriously invaded by luxuriant growth of varieties of weeds. The severe crop weed competition results in reduction of yield to the tune of 60-70 % due to the initial slow growth. There were mostly curative methods of weed control in chilli. Soil solarization wa a preventive method of weed control. Hence, it can be best practiced for efficient weed control. Soil solarization was a non hazardous and non chemical technique of controlling many soil borne pathogens and pest including weeds to the users as well as environment. It is a method of hydrothermal disinfection accomplished by covering moist soil with transparent polyethylene film during the hot summer months. The possible mechanisms of weed control by soil solarization are breaking dormancy of weed seeds and solar scorching of emerged weeds, direct killing of weed seeds by heat and indirect microbial killing of weed seeds weakened by heating. The present experiment was conducted to study the effect of different weed control measures on weeds and seedling growth in chilli nursery under Agro-climate of North Gujarat.

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MATERIALS AND METHODS

A field experiment was conducted on loamy sand soil at Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar during *Kharif* 2006. The treatments included were transparent polyethylene (TPE) 0.025, 0.050 and (BPE) 0.125 mm for 30 days and in combinations with one hand weeding at 20 DAS, Pendimethalin @ 0.5 kg ha^{-1} as a pre emergence, Fluchloralin @ 0.5 kg ha^{-1} as a pre emergence, Rabbing, Stale cultivation, weed free and Weedy check. The experiment was laid out in Randomized Block Design with four replications. The respective plots, which received soil solarization, were irrigated before two days and dug out manually with the help of spade at vapsa conditions. The polyethylene films was then spread on these plots and sealed along the borders by burying then the soil, with object to check the leakage of heat and to prevent blowing of film due to wind. The polyethylene sheets were removed after 30 days from soil solarization treatments to prepare seed beds for nursery seedlings of chilli (cv.