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Weed Control in Chilli and Capsicum Nursery by Soil Solarization

Soil Solarization as a method of weed control is done by heating the surface of soil by polyethylene films placed on moist soil to trap solar radiation and thereby increasing the soil temperature. Rampant occurance of weeds is a focial problem in nursery, weeds compete with nursery seedlings for water, nutrients, light and space which adversely affect the growth of the seedlings. Manual weeding in nursery is proved to be time consuming and expensive. The over dependence and over use of herbicides for weed management has created herbicide resistance, Herbicide Residues and environmental pollution. under this situation soil solarization is of late gaining importance besides being efficient and non hazardous to the user as well as to the environment.

A Field experiment was conducted in a red sandy loam soil at Main Research Station, Hebbal, Bangalore in a Randomised complete block design with three replications to study the effect of Soil Solarization as a method of weed control in chilli variety "Jwala" and capsicum variety "California Wonder". The data on weed count and weed dry weight in 0.25 m^2 and area were recorded and subjected to square root transformation. The observation on dry matter production of seedlings was recorded and B:C ratio was also worked out.

The weed flora of the experimental field included *Cynadon dactylon* pers., *Digetaria marginata* L., *Commelina bengalensis* L., among monocots and *Tridax procumbens* L., *Bidens pilosa* L., *Borreria stricta* L., among dicots and the only predominant sedge was *Cyperus rotundus* L. Soil solarization with transparent polyethylene proved better in increasing temperature to an extent of 53.2°C during maximum air temperature of 36.5°C. Similar findings were reported by Horwitz *et al.* (1983) and Rubin and Benjamin (1983).

Transparent polythylene sheets recorded significantly minimum weed count and weed dry weight (Table 1). This may be due to increase in soil temperature by transparent polyethylene with decrease in soil heat loss that mainly occurs through evaporation and partially to the green house effect. This is in line with findings of Salman and Gorski (1985) and Sivakumar and Marimuthu (1987). Mulching with coir pith, *pongamia* and *glyricidia* leaves did not differ significantly in controlling the weeds. The highest dry matter production was recorded in soil solarization with transparent polythelyne, due to drastic reduction in weed count and weed dry weight and less competition for the growth of seedlings. The result is inconfirmity with findings of Gruenzweig *et al.* (1993). Higher B.C ratio of 1.82 in chilli and 1.69 in capsicum were recorded in soil solarization with transparent polythylene. Thus, from the present study it can be concluded that covering the nursery bed with transparent polytheline would help in suppressing weeds and thereby increasing the dry matter production of seedlings.

Table 1. Weed count and weed dry weight as influenced by weed control treatments in chilli and capsicum nursery.

Treatments	Chilli				Capsicum			
	Weed Count (0.25m²)		Weed dry weight (g/0.25 m²)		Weed Count (0.25m²)		Weed dry weight (g/0.25 m²)	
	14 DAS	28 DAS	14 DAS	28 DAS	14 DAS	28 DAS	14 DAS	28 DAS
T^1 Soil Solarization for 15 days with TP	2.79 (7.33)	5.42 (28.98)	1.66 (2.55)	3.69 (13.18)	2.60 (6.33)	5.60 (31.00)	1.55 (1.93)	3.72 (13.45)
T^2 Soil Solarization for 30 days with TP	2.31 (5.00)	4.98 (24.33)	1.42 (1.56)	3.36 (10.79)	2.15 (4.33)	5.17 (26.33)	1.34 (1.36)	3.42 (11.23)
T^3 Soil Solarization for 15 days with BP	3.48 (12.99)	6.29 (40.65)	2.56 (6.12)	4.48 (19.65)	3.62 (12.66)	6.41 (40.66)	2.44 (5.36)	4.42 (19.09)
T^4 Soil Solarization for 30 days with BP	2.80 (12.66)	6.07 (37.66)	2.22 (4.66)	4.34 (18.35)	3.31 (10.66)	6.09 (36.66)	2.18 (4.13)	4.17 (16.88)
T^5 Mulching with coir pith at 5t/ha	4.33 (18.33)	6.90 (44.32)	3.29 (11.91)	4.99 (26.34)	4.79 (14.32)	7.89 (48.99)	3.22 (11.52)	5.06 (25.64)
T^6 Mulching with pongamia leaves at 5t/ha	4.52 (19.99)	6.96 (47.99)	3.35 (12.12)	5.02 (26.92)	4.91 (16.32)	7.90 (52.99)	3.25 (11.69)	5.08 (27.40)
T^7 Mulching with glyricidia leaves at 5t/ha	4.66 (21.33)	7.20 (51.66)	3.41 (12.10)	5.10 (22.68)	4.89 (17.99)	7.93 (57.66)	3.31 (12.11)	5.29 (28.80)
T^8 Pedimethalin at 1 kg ai/ha	3.32 (10.66)	5.46 (29.32)	2.12 (4.13)	3.86 (14.45)	3.07 (9.00)	5.07 (25.33)	1.70 (3.13)	3.51 (12.09)
T^9 Unweeded control	5.04 (24.99)	7.25 (63.66)	3.61 (12.56)	5.20 (29.62)	5.04 (24.99)	8.13 (65.66)	3.62 (12.63)	5.30 (31.10)
T^{10} Hand weeding at 20 DAS	4.81 (22.66)	5.04 (24.66)	3.44 (11.39)	3.50 (11.79)	4.52 (21.99)	4.81 (22.66)	3.38 (10.79)	3.30 (10.39)
SEm ±	0.16	0.13	0.11	0.07	0.15	0.11	0.14	0.08
C.D.(P=0.05)	0.47	0.39	0.33	0.23	0.45	0.33	0.41	0.24

TP : Transparent Polyethylene
BP : Black Polythylene
DAS : Days after sowing
Figures in paranthesis indicate original values.

Table 2. Weed count and weed dry weight as influenced by weed control treatments in chilli and capsicum nursery.

Treatments		Chilli		Capsicum		B:C ratio	
		Week after germination				Chilli	Capsicum
		II	IV	II	IV		
T^1	Soil Solarization for 15 days with TP	1.93	4.93	1.63	5.06	1.74	1.59
T^2	Soil Solarization for 30 days with TP	2.30	6.00	1.99	5.83	1.82	1.69
T^3	Soil Solarization for 15 days with BP	1.03	4.26	1.03	4.36	1.52	1.43
T^4	Soil Solarization for 30 days with BP	1.63	4.63	1.36	4.85	1.55	1.48
T^5	Mulching with coir pith at 5t/ha	0.93	3.90	0.86	4.30	1.42	1.32
T^6	Mulching with pongamia leaves at 5t/ha	0.90	3.63	0.80	3.93	1.39	1.29
T^7	Mulching with glyricidia leaves at 5t/ha	0.83	3.50	0.83	0.83	1.38	1.25
T^8	Pedimethalin at 1 kg ai/ha	0.60	3.10	0.55	3.63	1.25	1.19
T^9	Unweeded control	0.63	3.06	0.53	3.66	1.20	1.05
T^{10}	Hand weeding at 20 DAS	0.66	4.73	0.57	5.00	1.29	1.12
	S.Em ±	0.07	0.10	0.09	0.06		
	C.D.(P=0.05)	0.21	0.32	0.27	0.77		

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