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Short Communication

Effect of Integrated Weed Management Practices on Weed Parameters in Irrigated Cowpea CO (CP) 7

A. P. Srinivasaperumal[1], S. Kalaisudarson[2], V. Balamurugan*[3], T. Balakrishnan[4] and Arun[5]

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Cowpea (*Vigna unguiculata* L.) is one among the pulses that is extensively cultivated in arid and semi-arid tropics of Africa and Asia for its use as a multipurpose legume. In India, cowpea is grown widely as a *kharif* crop. Weed competition is one of the most important production constraints in cowpea leading to a reduction in yield of up to 91.6 per cent, if left uncontrolled [1]. Since, weeds serve as alternate hosts of various insect pests and pathogens of cultivated cowpea, the field is prone to pest and pathogen attack also. The availability of Photosynthetically Active Radiation (PAR) is sometimes restricted to the lower canopy of cowpea due to broad leaved weeds which further affects yield [2]. The mixing of weed seeds in the final produce affects the quality of cowpea seeds which reduces the market value. This study is designated to study the effect cultural and chemical weed management practices on weed parameters in irrigated cowpea.

The Experimental field is geographically situated at 11°38' North latitude and 79°70' East longitude and at an Altitude of ±5.79 m above Mean Sea Level and 6 km away from Bay of Bengal. The climate of Sivapuri is moderately warm with hot summer months. The cowpea crop received a rainfall of 378.4 mm distributed over 23 rainy days. The maximum temperature ranges from 33.2°C to 36.2°C with a mean of 34.8°C. The minimum temperature ranges from 24.1°C to 26.5°C with a mean of 25.3°C and relative humidity ranges from 65 to 92 per cent. The soil texture of the experimental field was sandy clay loam. The soil was low in available nitrogen, low in available phosphorous and medium in available potassium. The cowpea variety Co (CP) 7 seed were procured and used for the study. The experiment was laid out in a Randomized Block design with three replications. The details of the treatment schedule were T_1: Unweeded control, T_2: Hand weeding alone at 15 DAS, T_3: Inter cultivation alone at 15 DAS, T_4: Two hand weeding at 20 and 40 DAS, T_5: Application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence, T_6: Application of Quizalofop-ethyl @ 0.04 kg ha^{-1} as post-emergence at 20 DAS, T_7: Application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + one hand weeding at 30 DAS, T_8: Application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + Inter cultivation at 20 DAS, T_9: Application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + Quizalofop-ethyl @ 0.04 kg ha^{-1} as post-emergence at 20 DAS.

* A. P. Srinivasaperumal
✉ srinivasaperumal.ap@gmail.com

[1-5] Department of Agronomy, Annamalai University, Annamalai Nagar - 608 002, Tamil Nadu, India

Total weed count

The four weed species were *Cleome viscosa*, *Cyperus rotundus*, *Echinochloa colonum* and *Trianthema portulacastrum.* The least total weed count observed in the treatment application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + inter cultivation at 20 DAS (T_8) was 30.05, 69.42 and 85.58 No./m^2 on 30, 45 DAS and at harvest respectively. This was on par with two hand weeding at 20 and 40 DAS (T_4). This was followed by application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + Quizalofop-ethyl @ 0.04 kg ha^{-1} as post-emergence at 20 DAS (T_9). Unweeded control (T_1) registered the highest weed count of 265.88, 410.85 and 442.49 No./m^2 on 30, 45 DAS and at harvest, respectively [3-4].

Weed biomass

The data observed on 30, 45 DAS and at harvest shows that among the weed management practices, application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + inter cultivation at 20 DAS (T_8) registered with the least weed biomass of 18.79, 64.19 and 153.89 g m^{-2} on 30, 45 DAS and at harvest respectively. The treatment T_8 was on par with Two hand weeding at 20 and 40 DAS (T_4). The highest weed biomass was recorded in the unweeded control (T_1) (67.27, 347.28 and 648.80 g m^{-2} on 30, 45 DAS and at harvest, respectively) [5-6].

Weed control index (WCI)

Among the weed management practices, application of pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + inter

cultivation at 20 DAS (T_8) registered the highest Weed control index of 81.52. This was on par with two hand weeding at 20 and 40 DAS (T_4). This was followed by application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + Quizalofop-ethyl @ 0.04 kg ha^{-1} as post-emergence at 20 DAS (T_9) and application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + one hand weeding on 30 DAS (T_7) [7-8].

Table 1 Effect of integrated weed management practices on weed parameters in irrigated cowpea Cp (CP) 7

Treatments	Total weed count (m^2)			Weed DMP (kg ha^{-1})			WCE (%)
	30 DAS	45 DAS	At harvest	30 DAS	45 DAS	At harvest	
T_1: Unweeded control	265.88	410.85	442.49	67.27	347.28	648.80	-
T_2: Hand weeding alone at 15 DAS	161.28	255.52	296.97	51.60	265.05	482.07	23.68
T_3: Inter cultivation alone at 15 DAS	126.05	207.73	238.71	44.08	230.89	419.48	33.52
T_4: Two hand weeding at 20 and 40 DAS	35.82	78.71	91.38	21.95	91.19	176.87	73.74
T_5: Application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence	84.60	162.30	187.49	35.93	193.30	357.03	44.34
T_6: Application of Quizalofop-ethyl @ 0.04 kg ha^{-1} as post-emergence at 20 DAS	199.61	310.82	361.94	58.94	298.54	547.84	14.04
T_7: Application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + one hand weeding at 30 DAS	66.67	122.54	139.86	31.04	148.41	287.05	57.27
T_8: Application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + Inter cultivation at 20 DAS	30.05	69.42	85.58	18.79	64.19	153.89	81.52
T_9: Application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + Quizalofop-ethyl @ 0.04 kg ha^{-1} as post-emergence at 20 DAS.	56.73	111.03	127.60	29.84	137.06	255.82	60.53
S.Ed	0.55	0.71	0.80	2.62	14.99	29.18	-
CD (p = 0.05)	1.17	1.50	1.70	5.55	31.79	61.86	-

SUMMARY

A field experiment was carried out in the farmers field at Sivapuri village, Chidambaram Taluk, Cuddalore district to study the effect of cultural and chemical weed management practices on weed parameters in irrigated cowpea. The cowpea variety Co (CP) 7 was used for this study. There were altogether nine treatments. The weeds observed in the field were *Echinochloa colonum*, *Cynodon dactylon*, *Cyperus rotundus*, *Trianthema portulacastrum*, *Cleome viscosa*, *Phyllanthus niruri* and *Eclipta alba*. Among the weed control measures, application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + inter cultivation by star weeder at 20 days after sowing significantly reduced the weed population, weed biomass and recorded the highest Weed Control Index increase and regarded as the best treatment. It is followed by two hand weeding at 20 and 40 days after sowing. The treatment unweeded control recorded the highest weed population, weed biomass and lowest weed control index with decreased yield of cowpea. From the results of the field experiments carried out, it is evident that the treatment application of Pendimethalin @ 0.5 kg ha^{-1} as pre-emergence + inter cultivation on 20 days after sowing by star weeder was most effective weed management practices of cowpea with an optimum growth.

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