



Short communication

Effect of thiourea application on cowpea [*Vigna unguiculata* (L.) Walp.] productivity under rainfed conditions

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Received 1 December 2003; received in revised form 28 September 2004; accepted 18 October 2004

Abstract

Field experiments in the sandy loam soils of Pattambi during the *khariif* seasons of 2000-2002 revealed that thiourea application consistently increased cowpea productivity under rainfed conditions. Soaking seeds in 500 ppm thiourea solution followed by two sprays (at vegetative and flowering stages) was most effective and increased seed yield by 26% over control. This treatment also resulted in the higher economic benefits and gave an extra return of Rs. 2823 over that of untreated control.

Key words: seed soaking, foliar spray, BC ratio, harvest index

Cowpea is the most widely cultivated pulse crop of Kerala. Although pulses are grown round the year and over a range of farming situations in the state, there exists a large gap between the supply and demand for pulses and over 90% of the state's pulse requirement is being satisfied through inter-state trade. Thus, there is an urgent need to step up pulse productivity of the state in general and cowpea productivity in particular. Thiourea, a sulphahydral compound, is known to improve pulse productivity and its role as a drought ameliorant is well established under the arid and semi-arid regions (Sahu et al., 1993). A study was, therefore, undertaken to assess the effect of thiourea seed treatment and foliar spray on cowpea performance in the humid regions of Kerala.

Three field experiments were conducted under the AICRP on Arid Legumes at Pattambi during the *khariif* seasons of 2000, 2001 and 2002. The soil of the experimental site was sandy loam with pH 5.6 and contained 0.102 g kg⁻¹ available N, 0.0089 g kg⁻¹ available P and 0.049 g kg⁻¹ available K. The test variety 'Kanakamani' was sown as a rainfed crop at 30 x 15 cm spacing and fertilizers were applied at the rate of 20 kg N, 30 kg P₂O₅

and 10 kg K₂O ha⁻¹. The experimental variables included seed soaking in thiourea (500 ppm), seed soaking in water, single thiourea spray (500 ppm) at vegetative stage, single thiourea spray (500 ppm) at flowering stage, two sprays at vegetative and flowering stages, and the combinations of seed soakings and foliar sprays, besides an untreated control. The trial was laid out in randomized block design with three replications. Observations on growth and yield attributes were recorded at the time of harvest and the data were statistically analyzed following the ANOVA technique (Panse and Sukhatme, 1985).

Pooled data for three years showed that thiourea application exerted a significant impact on growth and yield of cowpea (Table 1). The highest yield was obtained with seed soaking in 500 ppm thiourea solution plus two foliar sprays at vegetative and flowering stages (844 kg ha⁻¹). This was, however, followed by seed soaking in water + foliar sprays of thiourea (500 ppm) at vegetative stage and flowering stages (827 kg ha⁻¹), and foliar application of thiourea at vegetative stage (809 kg ha⁻¹). These treatments recorded respectively 26.1, 23.6 and 20.9% more yield than the control. Similar results were reported earlier in cowpea by Sharma (2000) and Yadav et al. (2003).

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Table 1. Effect of thiourea application on growth, yield and economics of cowpea (pooled data for 2000, 2001 and 2002 crop seasons at Pattambi, Kerala)

Treatment	Height (cm)	Mean no. of branches	Dry matter (kg ha ⁻¹)	100 seed weight (g)	Harvest index	Yield (kg ha ⁻¹)	% increase over control	Net return (Rs ha ⁻¹)	B:C ratio
Control	45.84	3.42	1518	9.17	45.46	669.6	-	5591	1.71
TU SS	48.35	3.60	1553	9.63	46.90	716.9	7.07	6520	1.83
WS	47.17	4.08	1643	9.97	45.15	723.2	8.00	6613	1.84
TU spray VS	48.95	3.93	1646	9.72	50.13	809.4	20.89	8079	1.99
TU spray FS	51.48	4.08	1611	9.80	46.93	732.9	9.45	6548	1.80
TU spray VS and FS	48.42	3.20	1610	9.91	47.19	741.0	10.66	6399	1.76
TU SS + TU spray VS	45.57	3.95	1641	10.07	47.64	752.8	12.42	6887	1.84
TU SS + TU spray FS	47.82	4.22	1633	9.94	48.10	760.6	13.60	7045	1.86
TU SS + TU spray VS and FS	50.20	4.68	1756	10.37	49.28	844.6	26.14	8414	1.99
WS+TU spray VS	49.74	4.48	1650	9.98	47.35	761.1	13.67	7112	1.87
WS+TU spray FS	46.77	3.66	1619	9.91	46.59	720.8	7.64	6305	1.77
WS+TU spray VS and FS	48.91	4.51	1750	9.87	48.59	827.5	23.58	8130	1.96
CD at 5%	NS	0.81	101	0.39	2.81	45.1			

TU –thiourea; SS- seed soaking; WS- water soaking; VS- vegetative stage; FS- flowering stage
For both foliar spray and seed soaking 500 ppm thiourea solution was used

Seed soaking with 500 ppm thiourea combined with two foliar sprays of 500 ppm also recorded the highest number of branches, dry matter production, 100 seed weight and harvest index (Table 1), implying its favourable impact on photosynthetic production and/or its partitioning. Yadav et al. (2003) also reported such beneficial effects of thiourea on growth and yield attributes of cowpea and suggested that it might be due to the better partitioning of dry matter.

Furthermore, the highest net returns were obtained in the treatment with seed soaking (500 ppm thiourea) + two foliar sprays (Rs. 8414 ha⁻¹), followed by seed soaking in water + two foliar sprays (Rs. 8130 ha⁻¹) and foliar application of thiourea at vegetative stage (Rs. 8079), implying the potential of thiourea foliar sprays to promote productivity and profitability of rainfed cowpea cultivation in Kerala. The benefit cost ratio was also higher in these treatments, which is consistent with the findings of Bhadoria et al. (2002) and Yadav et al. (2003).

Acknowledgements

The authors are grateful to ICAR for providing necessary

financial help. The authors also wish to place on record the facilities provided by the Kerala Agricultural University for conducting the study.

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