

Influence of Integrated Weed Management Practices on Weed Dynamics and Yield of Baby Corn in Southern Agro-climatic Zone of Andhra Pradesh

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Baby corn (*Zea mays* L.) cultivation provides tremendous avenues for crop diversification, crop intensification, value addition and revenue generation. Being relatively a new introduction to the domain of study, it requires suitable integrated weed management practices for realizing higher productivity and monetary returns. Manual weeding though very effective in controlling weeds, very often is cumbersome, labour intensive, expensive and time consuming (Warade *et al.*, 2006). With the advancement in technology, number of herbicides are now available which can be used effectively and economically. Hence, present investigation was undertaken to find out effective integrated weed management practice for baby corn.

A field experiment was conducted at S. V. Agricultural College Farm, Tirupati during **rabi** season of 2009 on sandy loam soils with pH 7.3 and 227 kg, 26 kg and 145 kg N, P₂O₅ and K₂O/ha, respectively. The experiment was laid out in a randomized block design with 11 treatments viz., atrazine @ 1.0 kg/ha as pre-emergence (T₁), oxyfluorfen @ 0.2 kg/ha as pre-emergence (T₂), pendimethalin @ 1.0 kg/ha as pre-emergence (T₃), atrazine @ 1.0 kg/ha as pre-emergence+one intercultivation at 30 DAS (T₄), oxyfluorfen @ 0.2 kg/ha as pre-emergence+one intercultivation at 30 DAS (T₅), pendimethalin @ 1.0 kg/ha as pre-emergence+one intercultivation at 30 DAS (T₆), atrazine @ 1.0 kg/ha as pre-emergence+paraquat @ 0.5 kg/ha as post-emergence at 30 DAS (T₇), pendimethalin @ 1.0 kg/ha as pre-emergence+paraquat @ 0.5 kg/ha as post-emergence at 30 DAS (T₈), oxyfluorfen @ 0.2 kg/ha as pre-emergence+paraquat @ 0.5 kg/ha as post-emergence at 30 DAS (T₉), hand weeding twice at 15 and 30 DAS (T₁₀) and weedy check (T₁₁) replicated thrice. The recommended dose of nutrients was 150 kg N, 75 kg P₂O₅ and 40 kg K₂O/ha. Fertilizer nitrogen was applied through urea in two equal splits viz., ½ as basal and ½ at 30 DAS. Entire quantity of phosphorus and potassium was applied as basal through single super phosphate and muriate of potash, respectively. The test variety "Golden Baby" was sown during 2nd week of

November with a spacing of 60 x 20 cm. Atrazine, pendimethalin and oxyfluorfen were applied as pre-emergence spray as per treatments one day after sowing the crop with a spray volume of 500 l of water/ha, while paraquat was applied as post-emergence at 30 DAS, selectively by attaching plastic hoods at the nozzle. Hand weeding and intercultivation were carried out as per the scheduled time according to the treatments. The density and dry weight of weeds were recorded by placing a quadrant of size 0.5 x 0.5 m randomly at four places in each plot. The data on weed density and dry weight were subjected to square root transformation. Harvesting of cobs was done as and when the silk emergence was observed (2-3 cm silk length).

The major weed flora of the experimental site was *Cynodon dactylon* L. Pers. (Bermuda grass), *Digitaria sanguinalis* L. Scop. (crab grass) and *Dactyloctenium aegyptium* L. Beauv. (crowfoot grass) among grasses, *Cyperus rotundus* L. (nutsedge) as sedge, while *Cleome viscosa* L. (wild mustard), *Commelina benghalensis* L. Br. (day flower) and *Trichoderma indicum* L. (Indian forage) among broad-leaved weeds.

Weed density and dry weight were significantly influenced by the different weed management practices. Lowest density and dry weight of weeds were recorded with hand weeding twice at 15 and 30 DAS, which was comparable to pre-emergence application of atrazine + one intercultivation at 30 DAS (Table 1). These findings are in conformity with the results of Singh *et al.* (2009). Similarly, pre-emergence application of atrazine might have effectively hindered the germination of weeds, while intercultivation at 30 DAS removed the weeds germinated later (Mundra *et al.*, 2003). Highest weed control efficiency was found with hand weeding twice which was, however, at par with pre-emergence application of atrazine + one intercultivation at 30 DAS.

The highest cob and green fodder yield of baby corn was recorded with pre-emergence application of atrazine+one intercultivation at 30 DAS which was, however, at par with pre-emergence application of atrazine+post-emergence application of paraquat at 30

Table 1. Effect of integrated weed management practices on weed dynamics in baby corn

Treatments	Weed density (No./m ²)				Weed dry weight (g/m ²)*	Weed control efficiency (%)
	Grasses	Broad-leaved weeds	Sedges	Total		
T ₁ : Atrazine @ 1.0 kg/ha as pre-emergence	5.30 (27)	6.31 (39)	10.90 (118)	13.63 (185)	9.95 (98)	44.1
T ₂ : Oxyfluorfen @ 0.2 kg/ha as pre-emergence	3.98 (15)	5.37 (28)	9.48 (89)	11.55 (132)	8.50 (72)	59.3
T ₃ : Pendimethalin @ 1.0 kg/ha as pre-emergence	5.61 (31)	7.25 (52)	11.92 (141)	15.00 (224)	10.77 (115)	34.5
T ₄ : Atrazine @ 1.0 kg/ha as pre-emergence+one intercultivation at 30 DAS	2.61 (6)	2.12 (4)	6.01 (35)	6.82 (46)	3.44 (11)	93.5
T ₅ : Oxyfluorfen @ 0.2 kg/ha as pre-emergence+one intercultivation at 30 DAS	3.49 (11)	3.39 (11)	8.28 (68)	9.55 (90)	5.04 (25)	85.8
T ₆ : Pendimethalin @ 1.0 kg/ha as pre-emergence+one intercultivation at 30 DAS	3.03 (9)	2.80 (7)	6.99 (48)	8.05 (64)	6.07 (36)	79.4
T ₇ : Atrazine @ 0.5 kg/ha as pre-emergence+paraquat @ 0.5 kg/ha as post-emergence at 30 DAS	2.68 (7)	2.27 (4)	6.52 (42)	7.34 (53)	4.37 (19)	89.4
T ₈ : Pendimethalin @ 0.5 kg/ha as pre-emergence+paraquat @ 0.5 kg/ha as post-emergence at 30 DAS	3.34 (11)	2.86 (7)	7.18 (51)	8.36 (69)	6.24 (38)	78.2
T ₉ : Oxyfluorfen @ 0.15 kg/ha as pre-emergence+paraquat @ 0.5 kg/ha as post-emergence at 30 DAS	3.63 (13)	3.67 (13)	8.51 (72)	9.91 (97)	5.51 (30)	83.0
T ₁₀ : Hand weeding twice at 15 and 30 DAS	1.58 (2)	1.58 (2)	6.01 (35)	6.34 (39)	2.73 (7)	96.1
T ₁₁ : Weedy check	9.12 (83)	9.41 (88)	13.09 (171)	18.50 (341)	13.29 (176)	-
LSD (P=0.05)	0.41	0.51	0.45	0.75	0.57	-

Values in parentheses are original. *Data transformed to square root transformation.

Table 2. Effect of integrated weed management practices on yield and economics in baby corn

Treatments	Baby corn yield (kg/ha)	Green fodder yield (kg/ha)	Net returns (Rs./ha)	Benefit : cost ratio
T ₁ : Atrazine @ 1.0 kg/ha as pre-emergence	7951	16940	63240	4.22
T ₂ : Oxyfluorfen @ 0.2 kg/ha as pre-emergence	4455	11995	26066	2.25
T ₃ : Pendimethalin @ 1.0 kg/ha as pre-emergence	7070	15046	53171	3.59
T ₄ : Atrazine @ 1.0 kg/ha as pre-emergence+one intercultivation at 30 DAS	10668	19466	90490	5.51
T ₅ : Oxyfluorfen @ 0.2 kg/ha as pre-emergence+one intercultivation at 30 DAS	5426	13573	35667	2.67
T ₆ : Pendimethalin @ 1.0 kg/ha as pre-emergence+one intercultivation at 30 DAS	8968	16940	72105	4.44
T ₇ : Atrazine @ 0.5 kg/ha as pre-emergence+paraquat @ 0.5 kg/ha as post-emergence at 30 DAS	10611	17992	89602	5.46
T ₈ : Pendimethalin @ 0.5 kg/ha as pre-emergence+paraquat @ 0.5 kg/ha as post-emergence at 30 DAS	7809	15572	60658	3.95
T ₉ : Oxyfluorfen @ 0.15 kg/ha as pre-emergence+paraquat @ 0.5 kg/ha as post-emergence at 30 DAS	4542	12026	26671	2.26
T ₁₀ : Hand weeding twice at 15 and 30 DAS	9756	16829	80588	4.96
T ₁₁ : Weedy check	4434	11995	27801	2.47
LSD (P=0.05)	704	830	2507	0.12

DAS followed by hand weeding twice (Table 2). This might be due to better crop-weed competition for growth resources throughout the crop growth period and congenial environment available for better expression of growth and yield potential coupled with cumulative effect of elevated growth stature as well as yield structure. Application of oxyfluorfen @ 0.2 kg/ha as pre-emergence resulted in the lowest cob and fodder yield owing to initial phytotoxicity noticed with its application. Significantly higher net returns (Rs. 90,490/ha) and B : C ratio (5.51) were recorded with pre-emergence application of atrazine + one intercultivation at 30 DAS which was, however, comparable with pre-emergence application of atrazine + post-emergence application of paraquat at 30 DAS (Table 2). This may be attributed to higher cob yield and lesser cost of weed control with herbicide.

From the present study, it can be concluded that

integrating pre-emergence application of atrazine either with intercultivation or paraquat results in higher corn and green fodder yield and effective control of weeds in baby corn during **rabi** in southern agro-climatic zone of Andhra Pradesh.

REFERENCES

- Mundra, S. L., A. K. Vyas and P. L. Maliwal. 2003. Effect of weed and nutrient management on weed growth and productivity of maize (*Zea mays* L.). *Ind. J. Weed Sci.* **35** : 57-61.
- Singh Moolchand, S. Prabhukumar, C. V. Sairam and Arun Kumar. 2009. Evaluation of different weed management practices in rainfed maize on farmers' fields. *Pak. J. Weed Sci. Res.* **15** : 183-189.
- Warade, A. D., V. S. Gonge, N. D. Jog Dande, P. G. Ingole and A. P. Karunakar. 2006. Integrated weed management in onion. *Ind. J. Weed Sci.* **38** : 92-95.