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Short communication

Comparative efficacy of different herbicides in summer pearlmillet

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Pearlmillet (*Pennisetum glaucam* L.) is one of the major coarse grain crops and is considered to be a poor man's food. Weed management in pearl millet during early growth period of crop is most important. On an average, 55% yield reduction due to heavy weed infestation in pearl millet was observed by Banga *et al*. (2000). The predominant methods of weed management are inter-culturing and hand weeding in pearlmillet crop. The use of herbicides has revolutionized weed management and reduces the cost of cultivation. therefore integrated approach for weed management using chemical and manual methods were evaluated for weed management pearlmillet.

A field experiment was conducted during summer season of the year 2012-13 at the farm of B. A. College of Agriculture, Anand Agricultural University, Anand (Gujarat). The soil of the experimental area was loamy sand in texture, low in N (140 kg/ha), medium in available P (40 kg/ha) and high in available K (300 kg/ha) with slightly alkaline in reaction (pH 7.50). The experiment was laid out in randomized block design with four replications and with twelve treatments. Herbicides were sprayed with knapsack sprayer fitted with flat fan nozzle using 500 liter of water/ha. The weed count and dry weight of weeds were recorded at 20 and 40 DAS and at harvest.

Table 1. Effect of practices on density, dry weight and weed control efficiency

Treatment	Weed density (no./m^2)				Weed dry weight (g/m^2)				Weed index (%)	Weed control efficiency (%)	
	Dicot		Monocot		Dicot		Monocot				
	20 DAS	At harvest	20 DAS	At harvest	20 DAS	At harvest	20 DAS	At harvest		20 DAS	At harvest
Atrazine 1000 g/ha PE	4.16^{e} (17.00)	1.78^{e} (2.75)	6.60^{bc} (43.25)	5.19^{b} (26.50)	1.64^{e} (2.23)	1.34^{e} (1.33)	3.73^{de} (2.23)	2.41^{de} (5.38)	11.18	54.3	50.1
Atrazine 1000 g/ha PE *fb* HW at 30 DAS	4.05^{e} (16.00)	1.18^{f} (1.25)	5.33^{ef} (28.00)	2.72^{d} (7.00)	1.34^{f} (1.33)	1.05^{f} (0.48)	3.61^{e} (1.33)	1.83^{g} (2.88)	2.21	61.7	63.5
Atrazine 1000 g/ha10 DAS	4.23^{e} (17.50)	2.05^{de} (3.75)	6.95^{b} (48.00)	5.12^{b} (26.00)	1.66^{e} (2.30)	1.36^{e} (1.38)	4.99^{b} (2.30)	2.68^{d} (6.75)	11.93	40.8	45.5
Atrazine 1000 g/ha at 10 DAS *fb* HW at 30 DAS	4.10^{e} (16.50)	1.32^{e} (2.50)	6.54^{bc} (42.50)	3.19^{d} (9.75)	1.36^{f} (1.38)	1.03^{f} (0.63)	4.30^{c} (18.02)	1.85^{g} (2.95)	4.38	49.4	62.6
Oxyfluorfen 80 g/ha PE	8.35^{b} (69.50)	3.44b^{c} (11.50)	6.01^{cd} (35.75)	5.19^{b} (26.50)	3.56^{b} (12.25)	2.68^{b} (6.73)	4.15^{cd} (16.75)	3.38^{b} (10.95)	15.82	38.4	20.8
Oxyfluorfen 80 g/ha PE *fb* HW at 30 DAS	6.76^{cd} (45.50)	2.34^{d} (5.00)	4.26^{g} (18.00)	3.03^{d} (8.75)	2.81^{c} (7.45)	1.38^{e} (1.43)	3.74^{de} (13.62)	2.52^{d} (5.90)	7.51	47.4	48.1
Oxyfluorfen 100 g/ha PE	6.21^{d} (52.00)	3.23^{bc} (10.00)	5.72^{de} (32.50)	4.40^{c} (19.00)	3.34^{b} (10.73)	2.11^{d} (3.98)	3.52^{e} (11.97)	3.08^{c} (9.03)	14.68	45.4	31.7
Oxyfluorfen 100 g/ha PE *fb* HW at 30 DAS	6.51^{cd} (42.50)	1.85^{e} (3.00)	4.37^{g}(18. 75)	2.86^{d} (7.75)	2.57^{d} (6.15)	1.35^{e} (1.35)	3.48^{e} (11.65)	2.17^{ef} (4.23)	5.36	51.5	54.2
Pendimethalin 750 g/ha PE	6.71^{cd} (45.00)	3.56^{b} (12.25)	4.70^{fg} (21.75)	4.68^{bc} (21.50)	2.91^{c} (8.00)	2.29^{c} (4.83)	3.01^{f} (8.60)	3.31^{bc} (10.53)	24.55	53.1	26.2
Pendimethalin 750 g/ha PE *fb* HW at 30 DAS	7.19^{c} (52.00)	3.11^{c} (9.25)	4.27^{g} (18.00)	3.02^{d} (8.75)	2.87^{c} (7.80)	2.08^{d} (3.85)	2.67^{f} (7.80)	2.12^{f} (4.08)	16.23	56.1	46.0
Interculturing*fb* HW at 20 and 40 DAS	0.70^{f} (0.00)	0.70^{g} (0.00)	0.70^{h} (0.00)	0.07^{e} (0.00)	0.70^{g} (0.00)	0.70^{g} (0.00)	0.70^{g} (0.00)	0.07^{h} (0.00)	-	92.0	86.9
Weedy check	10.63^{a} (113.00)	5.37^{a} (28.50)	9.88^{a} (97.25)	8.64^{a} (74.25)	4.87^{a} (23.33)	3.64^{a} (12.78)	7.36^{a} (53.82)	4.23^{a} (17.43)	37.05	-	-
LSD (P=0.05)	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.			

Figures in the parenthesis are original values. All figures are subjected to transformed values to square root ($\sqrt{x + 0.5}$). DAS- Days after sowing; *fb*- Followed by, Different alphabets dinote significant difference among treatments.

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Table 2. Effect of weed management practices on growth and yield attributing characters of pearl millet

Treatment	Initial Plant population (no./m row length)	Crop dry matter accumulation (g/plant)		Effective tillers/ plant	Test weight (g)	Grain yield (t/ha)	Stover yield (t/ha)	Protein content (%)	Plant height at harvest (cm)	CBR
		30 DAS	At harvest							
Atrazine 1000 g/ha PE	10.37^{a}	4.01^{bcd}	33.66^{abc}	4.02^{bc}	11.05^{bcd}	6.95^{bcd}	18.20^{ab}	10.32^{de}	179^{bc}	4.84
Atrazine 1000 g/ha PE *fb* HW at 30 DAS	10.50^{a}	4.27^{b}	35.72^{ab}	4.35^{b}	11.92^{ab}	7.65^{a}	18.97^{ab}	11.48^{ab}	181^{bc}	5.04
Atrazine 1000 g/ha10 DAS	10.50^{a}	3.99^{bcde}	33.51^{abc}	4.05^{bc}	11.06^{bcd}	6.88^{bcd}	18.24^{ab}	10.58^{bcde}	185^{ab}	4.81
Atrazine 1000 g/ha at 10 DAS *fb* HW at 30 DAS	10.25^{a}	4.09^{bc}	35.38^{ab}	4.27^{b}	11.30^{abc}	7.53^{ab}	18.45^{ab}	11.40^{abc}	189^{ab}	4.92
Oxyfluorfen 80 g/ha PE	9.85^{ab}	3.71^{cde}	29.60^{def}	3.85^{bc}	10.43^{cde}	6.58^{d}	15.79^{cde}	10.43^{cde}	174^{bc}	4.50
Oxyfluorfen 80 g/ha PE *fb* HW at 30 DAS	9.85^{ab}	3.66^{de}	32.62^{bcd}	3.95^{bc}	11.06^{bcd}	7.23^{abc}	17.05^{bcd}	11.30^{abc}	179^{bc}	4.70
Oxyfluorfen 100 g/ha PE	9.77^{ab}	3.65^{de}	29.97^{cde}	3.75^{bc}	10.77^{cde}	6.67^{cd}	17.03^{bcd}	11.18^{abcd}	178^{bc}	4.58
Oxyfluorfen 100 g/ha PE *fb* HW at 30 DAS	9.55^{ab}	3.61^{de}	33.20^{abc}	4.25^{b}	11.27^{abc}	7.40^{ab}	17.96^{abc}	11.40^{abc}	180^{bc}	4.80
Pendimethalin 750 g/ha PE	6.60^{c}	3.63^{de}	27.65^{ef}	3.80^{bc}	10.25^{de}	5.89^{e}	15.13^{de}	10.47^{cde}	174^{bc}	3.97
Pendimethalin 750 g/ha PE *fb* HW at 30 DAS	6.85^{c}	3.65^{de}	28.88^{ef}	4.25^{bc}	10.05^{e}	6.55^{d}	15.18^{de}	11.10^{abcd}	180^{bc}	4.14
Interculturing *fb* HW at 20 and 40DAS	10.59^{a}	4.85^{a}	37.00^{a}	5.55^{a}	12.10^{a}	7.81^{a}	19.44^{a}	11.72^{a}	201^{a}	5.01
Weedy check	10.50^{a}	3.60^{e}	26.08^{f}	3.35^{c}	9.89^{e}	4.92^{f}	14.27^{e}	10.02^{e}	164^{c}	3.73
LSD (P=0.05)	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.

Different alphabets dinote significant diffenrence among treatments.

Treatment of interculturing *fb* HW at 20 and 40 DAS recorded the lowest number of monocot and dicot weeds at 20 DAS and at harvest. Among the different chemical weed management practices atrazine 1000 g/ha PE *fb* HW at 30 DAS recorded minimum number of monocot and dicot weeds (Table 1). These results are in accordance with the Singh *et al*. (2001). Among different weed management practices, interculturing *fb* HW at 20 and 40 DAS recorded the lowest dry weight of monocot and dicot weeds at 20 DAS and at harvest. Application of atrazine 1000 g/ha PE *fb* HW at 30 DAS recorded lower monocot and dicot weed dry weight at different intervals followed by atrazine 1000 g/ha at 10 DAS *fb* HW at 30 DAS. The highest WCE and lowest weed index was registered under treatment of interculturing *fb* HW at 20 and 40 DAS. (Sharma and Jain 2003).

Plant height, crop dry matter accumulation/plant, effective tillers/plant, protein content recorded higher under treatment of interculturing *fb* HW at 20 and 40 DAS followed by atrazine 1000 g/ha PE *fb* HW at 30 DAS. Pendimethalin treated plots showed poor germination which might be due to the phytotoxic effect of herbicide. Further, interculturing *fb* HW at 20 and 40 DAS registered higher grain (7.82 t/ha) and stover yields (19.44 t/ha) which was closely followed by atrazine 1000 g/ha PE *fb* HW at 30 DAS (Table 2). While the highest Cost benefit : ratio (CBR) value was achieved under application of atrazine 1000 g/ha PE *fb* HW at 30 DAS. These results are in line with Kaur and Singh (2006).

SUMMARY

Among the different chemical weed management practices atrazine 1000 g/ha PE *fb* HW at 30 DAS recorded minimum number of monocot and dicot weed. Pendimethalin treated plots showed poor germination which might be due to the phytotoxic effect of herbicide. Further, interculturing *fb* HW at 20 and 40 DAS registered higher grain (7.82 t/ha) and stover yields (19.44 t/ha) which was closely followed by atrazine 1000 g/ha PE *fb* HW at 30 DAS

REFERENCES

Banga RS, Yadav A, Malik RK, Pahwa SK and Malik RS. 2000. Evaluation of tank mixture of acetachlore and atrazine or 2, 4-D Na against weeds in pearl millet. *Indian Journal of Weed Science* **32**(3&4): 194-198.

Kaur A and Singh VP. 2006. Weed dynamics as influenced by planting methods, mulching and weed control in rainfed hybrid pearl millet (*Pennisetum glaucam). Indian Journal of Weed Science* **38**(1&2): 135-136.

Sharma OL and Jain NK. 2003. Integrated weed management in pearl millet. *Indian Journal of Weed Science* **35**(1&2): 134-135.

Singh RK, Chauhan SPS and Singh S. 2001. Integrated weed management in pearl millet (*Pennisetum typhoides*). *Indian Journal of Weed Science* **33**(3&4): 206-208.