GAU Res. J. 1990. 15 (2) : 46-48

Effect of Irrigation Timing and Isoproturon Application on Weeds and Yield of Isabgul (*Plantago ovata* Forsk)

P. H. Patel and H. M. Mehta

Department of Agronomy,
B. A. College of Agriculture, Anand

Isabgul is one of the very few medicinal crops cultivated in the country. The area and production *isabgul* in the Gujarat State during the year 86 were 26900 ha and 18800 t, respectively. broadcast sown crop, *isabgul* can not be intercultured hence, hand weeding is the mainstay for weed control which is not only costly but availability of labourers in time is a baffling problem as well. Under such conditions, chemical weed control has been suggested to be better. Farmers in North Gujarat was isoproturon for weed control in isabgul. However, at number of instances they do not get proper weed control probably due to non synchronization between irrigation timing and isoproturon application. Since, soil moisture influences on the activity of isoproturon against weeds (Blair, 1985), it was deemed useful to study the relationship.

The field experiment was conducted during *rabi* season of the year 1985-86 at the College Agronomy farm, Gujarat Agricultural University, Anand, on loamy sand soil, with a pH of 7.8, in split plot design with four replications. The eight irrigation timings viz., irrigation at 10 DBS (isoproturon 7 DBS), (isoproturon 3 DBS), at the same day of sowing (isoproturon on the same day), at same day of sowing (isoproturon 2 DAS), at same day of sowing (isoproturon 3 DAS), at 10 DAS isoproturon 10 DAS), at 20 DAS (isoproturon 20 DAS) and at 20 DAS (isoproturon-urea mixture) were relegated to main plot while weed management treatments viz., isoproturon at 0.5 kg/ha and 1.0 kg/ha, had weeding twice and unweeded control were taken as sub-plot treatments. Thus pre-sowing, pre-emergence and post emergence applications of isoproturon were tested along with irrigation timings in *isabgul*. The crop was fertilized at the rate of 25 kg/ha in the form of urea keeping seed rate at 4 kg/ha. After giving light irrigation for germination subsequent irrigations to each treatments were given at 45 to 40 per cent available soil moisture depletion estimated gravimetrically.

The results on dry weight of weeds (Table 1) indicated that differences due to weed management were significant. Hand weeding significantly reduced the dry weight of weeds which was to the tune of 97.5 per cent as compared to unweeded control. It was observed that when isoproturon was sprayed on the established population of *C. album*, has controlled the weed, however when mixed with urea, due to bouncing of urea granules, the killing effect was comparatively very less. In this treatment the quantity of isoproturon (0.5 and 1.0 kg) was throughly mixed with urea (15 kg/ha) which form a dressing of isoproturon film on urea granules at the time of application.

From the present study it was revealed that isoproturon at the rate of 0.5 kg/ha was the threshold level, comparable with and weeding. Hand weeding significantly increased seed yield of *isabgul*. The increase was attributed to effective control of *C. album* upto maturity stage along with other weeds like *chenopodium album* L., *Argemone mexicana* L. and *cynodon dactylon* pers which provided increased straw yield. Findings are in agreement with Mehta *et al.* (1985) who indicated that three hand weedings gave seed yield of *plantago ovata* similar to the application of 0.5 kg/ha isoproturon as pre-sowing or pre-emergence. Higher rate (1.0 kg/ha) of herbicide was found phytotoxic and reduced the yield of crop. Among various interactions, the combination of irrigation immediately after sowing with hand weeding (I_1H_3) significantly increased seed yield but considering the

TABLE 1

Effect of irrigation timing and weed management on dry weed biomass and seed yield of *isabgul* at harvest (kg/ha).

Irrigation	*Seed yield*					*Dry weight of weeds*				
	H_1(0.5)	H_2(1.0)	H_3(HW)	H_4(UWC)	*Mean*	H_1(0.5)	H_2(1.0)	H_3(HW)	H_4(UWC)	*Mean*
I_1 - 10 DBS	1188	1219	1469	214	1022	720	264	78	1997	765
I_2 - 6 DBS	1492	1352	1688	138	1167	511	200	44	1820	644
I_3 - Same day	1578	1383	1766	110	1209	270	128	44	1794	559
I_4 - Same day	1422	1328	1422	74	1062	144	131	34	2033	586
I_5 - Same day	1571	1110	1477	148	1076	234	131	25	2080	618
I_6 - 10 DAS	1516	1399	1541	114	1142	338	231	31	1494	524
I_7 - 20 DAS	1414	1016	1555	138	1031	209	122	53	2070	613
I_8 - 20 DAS	813	753	1484	125	794	355	591	63	1806	754
Mean	1374	1195	1550	133	1062	373	255	47	1887	633

	S. Em.±	C. D. at 0.05		S. Em.±	C. D. at 0.05
I	43.094	126.764	I	67.22	N.S.
H	39.240	110.434	H	159.61	449.18
I × H	110.989	312.353	I × H	451.45	N. S.

NS = Not Significant DBS = Days before sowing DAS = Days after sowing

ost of hand weeding, herbicide was conducive. The reatment irrigation at sowing and isoproturon at ne rate of 0.5 kg/ha combination (I_3H_1), irrigation t 10 DAS and Isoproturon at the rate of 5 kg/ha $_6H_1$) were found beneficial both on yield and anagement point of view. The interaction I_1H_1, H_1, I_4H_1 and I_5H were at par but found difficult in anagement compared to previous two ombinations.

(Received on 11th July, 1988)

REFERENCES

Blair, A. M. (1985). Influence of soil moisture on isoproturon activity against *Alopecurus myosuroides. Weed Res.*, **25** (2) : 141-149.

Mehta, H. M., Trivedi, G. C. and Patel, H. R. (1985). Study the efficacy of herbicides for weed control in *isabgul (Plantago ovata).* In Abstract of papers, ISWS, Weed Sci. Conf., G.A.U. Anand, P. 75.