

Efficacy of Oryzalin in Onion

M. L. Kewat, Yogendra Singh and Shailendra Rathore

Department of Agronomy

Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur - 482 004 (M. P.), India

Onion is widely grown in different parts of the country under irrigated ecosystem. Early slow growth and poor foliage cover coupled with congenial soil conditions due to frequent irrigations, usually aggravate the problem of weeds. Resultantly, there is reduction in bulb yield of onion to the tune of 65-67% (Yaduraju and Ahuja, 1999). Presently, pendimethalin, oxyfluorfen and fluchloralin are the important herbicides, being used for controlling weeds in onion. But most of the time, these herbicides have not been found much effective in curbing the menace under diversified weed flora. Oryzalin has been reported very effective against narrow as well as broad-leaved weeds. Hence, an attempt has been made to study the efficacy of oryzalin at different doses of application in onion.

A field experiment was conducted at Adhartal Krishinagar Farm of Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur during **rabi** season of 2004-05. The soil of the experimental field was silty loam in texture, neutral in reaction (pH 7.2). The available N, P and K in the soil were 270, 15 and 380 kg ha⁻¹, respectively. Eight weed control treatments consisting of five doses of oryzalin (1.5, 2.0, 2.5, 3.0 and 3.5 kg ha⁻¹), pendimethalin at 1.5 kg ha⁻¹, oxyfluorfen at 0.2 kg ha⁻¹ and weedy, were tested in randomized block design and replicated four times. Seven weeks old seedlings of onion (cv. Nasik Red) were transplanted at a spacing of 15 x 10 cm on December 28, 2004. A fertilizer dose of 100 kg N, 50 kg P₂O₅ and 100 kg K₂O ha⁻¹ was given to the crop. The half of the nitrogen and full quantity of phosphatic and potassic fertilizers was applied at the time of transplanting and remaining half of the nitrogen was applied in two splits at 30 and 60 DAT uniformly. Oryzalin, pendimethalin and oxyfluorfen were applied as pre-emergence to weeds at 5 DAT using knapsack sprayer with a spray volume of 600 l ha⁻¹.

The major weeds were *Chenopodium*

album (80%), *Rumex dentatus* (54%) and *Portulaca oleracea* (14.5%) at 45 DAT. However, at 60 DAT *Brassica kaber* (12%), *Alternanthera philoxeroides* (16%) and *Polypogon monspeliensis* (15%) were also observed alongwith *C. album* (29%), *R. dentatus* (15%) and *P. oleracea* (12%).

Oryzalin at 1.5 kg ha⁻¹ curbed the population of *C. album*, *R. dentatus* and weed biomass by 93.2, 78.1 and 85.0% at 45 DAT, respectively, and was comparable to that of oxyfluorfen at 0.2 kg ha⁻¹ (Table 1). Pendimethalin at 1.5 kg ha⁻¹ gave excellent control of almost all the weeds including their dry weight (100%). Longer persistence of pendimethalin during **rabi** season due to low temperature could be assigned the reason for effective control of weeds even at advanced stage. Moreover, the activity of oryzalin against weeds was further improved with corresponding increase in dose from 2.0 to 3.5 kg ha⁻¹.

Onion population recorded 15 DAT was higher in plots treated with pendimethalin at 1.5 kg ha⁻¹, oxyfluorfen at 0.2 kg ha⁻¹ and oryzalin at 1.5 kg ha⁻¹ compared to weedy check. But further increase in dose of oryzalin from 2.0 to 3.5 kg ha⁻¹ reduced the onion population to the tune of 33.8 to 84.1% over its lowest dose (1.5 kg ha⁻¹).

The bulb yield was higher (20.8 t ha⁻¹) due to oryzalin at 1.5 kg ha⁻¹ to that of oxyfluorfen at 0.2 kg ha⁻¹ (22.3 t ha⁻¹) but both gave lower yields than pendimethalin at 1.5 kg ha⁻¹ (29.8 t ha⁻¹). Poor efficacy of oryzalin at 1.5 kg ha⁻¹ and oxyfluorfen against *C. album*, *P. oleracea*, *R. dentatus*, *A. philoxeroides* and *P. monspeliensis* at later stage caused lower bulb yields. Oryzalin at 2.0 to 3.5 kg ha⁻¹ reduced yields due to phytotoxicity.

REFERENCE

- Yaduraju, N. T. and K. N. Ahuja, 1999. Weed control in onion through herbicides. *Indian J. Weed Sci.* 31 : 253-254.

Table 1. Effect of treatments on weeds and the crop

Treatment	Dose (kg ha ⁻¹)	Weed population (No. m ⁻²)												Weed biomass (g m ⁻²)		Onion population yield (lakh ha ⁻¹) (t ha ⁻¹)	Bulb yield (t ha ⁻¹)		
		C. album			P. oleracea			R. dentatus			B. kabur			A. philoxeroides				P. monspeliensis	
		45 DAT	60 DAT	60 DAT	45 DAT	60 DAT	60 DAT	45 DAT	60 DAT	60 DAT	45 DAT	60 DAT	60 DAT	45 DAT	60 DAT			45 DAT	60 DAT
Oryzalin	1.5	3.0	3.5	2.5	3.0	1.75	4.25	1.75	3.75	-	3.5	-	3.5	-	3.5	13.32	265.50	6.56	20.8
Oryzalin	2.0	0.5	1.2	0.5	1.7	0.5	1.25	0.5	3.5	-	3.5	-	2.75	-	2.5	1.02	222.03	4.34	15.6
Oryzalin	2.5	0.0	0.0	0.0	2.7	0.0	0.0	0.0	2.5	-	2.25	-	2.25	-	2.0	1.07	119.90	2.47	11.6
Oryzalin	3.0	0.0	0.0	0.0	1.0	0.0	0.0	0.5	0.5	-	0.0	-	0.0	-	0.5	0.76	75.10	2.41	9.2
Oryzalin	3.5	0.0*	0.0	0.0	0.0	0.0	0.0	0.5	0.5	-	0.0	-	0.0	-	1.0	0.0	40.31	1.04	7.2
Pendimethalin	1.5	0.0	2.5	0.0	1.5	0.0	1.0	1.0	2.5	-	2.5	-	2.0	-	2.5	0.0	200.53	6.64	29.8
Oxyfluorfen	0.2	4.2	3.5	1.2	2.5	3.0	1.5	1.75	8.0	-	8.0	-	3.0	-	3.5	17.19	240.11	6.63	22.3
Weedy	-	44.0	20	3.0	9.0	8.0	10.0	-	-	-	-	-	11.0	-	10.0	88.62	965.73	6.61	14.8
LSD (P=0.05)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.18	11.92	0.18	1.9