Indian J. Weed Sci. **36** (3 & 4) : 282-284 (2004) *Short Communication*

Weed Suppressing Ability of Pea Cultivars

J. S. Mishra, V. P. Singh, B. T. S. Moorthy and N. T. Yaduraju
National Research Centre for Weed Science
Jabalpur-482 004 (Madhya Pradesh), India

Crop species and cultivars are known to differ in their competitiveness with weeds (Lemerle *et al.*, 1995). This offers opportunities to select and breed for competitive cultivars that can be adopted by the farmers as a part of integrated weed management programme. Field pea is an important pulse crop grown in winter season in Madhya Pradesh and uncontrolled weeds cause a yield reduction of 24 to 29% in this crop (Mishra and Bhan, 1997).

Competitive ability of seven pea cultivars viz., JP 885, Arkel, Green pearl, JP 180, KMR 6, DPP 62 and JM 6 against weeds was evaluated under weedy and single hand weeded conditions at the National Research Centre for Weed Science, Jabalpur during winter season of 2001-02. Treatments were replicated thrice in a factorial randomized block design. The soil was clay loam (Typic Chromusterts) having low available nitrogen (245 kg ha^{-1}), medium available phosphorus (19 kg ha^{-1}), and high available potassium (310 kg ha^{-1}), with organic carbon 0.57%

Table 1. Effect of pea cultivars and weed control methods on population and dry matter of weeds at 60 DAS

Treatment	Weed population (No. m^{-2})*							Total
	C. album	*V. sativa*	*L. aphaca*	*P. minor*	*A. ludoviciana*	Others	Total	weed dry matter (g m^{-2})
Cultivars								
JP 885	2.0	4.2	3.6	2.2	1.9	4.2	7.8	24.2
	(4)	(17)	(13)	(4)	(3)	(17)	(60)	
Arkel	3.1	4.2	3.7	2.9	1.7	2.5	7.8	28.2
	(9)	(17)	(13)	(8)	(2)	(6)	(60)	
Green pearl	3.4	4.3	3.6	2.5	2.2	3.1	8.1	61.5
	(11)	(18)	(13)	(6)	(4)	(9)	(65)	
JP 180	3.0	3.2	2.8	3.2	3.5	3.0	7.7	26.1
	(9)	(10)	(7)	(10)	(12)	(9)	(59)	
KMR 6	2.9	3.7	3.8	2.6	2.6	2.9	7.7	29.7
	(8)	(13)	(14)	(6.3)	(6)	(8)	(59)	
DPP 62	2.4	4.7	3.5	3.1	3.1	3.5	8.7	43.4
	(5)	(22)	(12)	(9)	(9.1)	(12)	(75)	
JM 6	2.4	2.8	2.8	3.0	3.1	3.1	7.1	30.1
	(5)	(7)	(7)	(9)	(9)	(9)	(50)	
LSD (P=0.05)	0.6	1.1	0.9	0.8	0.7	1.3	1.4	6.7
Weed control								
Weedy	2.8	4.6	4.0	2.8	2.9	4.1	8.9	49.1
	(7)	(21)	(16)	(7.3)	(8)	(16)	(79)	
Hand weeding	2.6	3.1	2.9	2.8	2.3	2.3	6.7	17.6
30 DAS	(6)	(9)	(8)	(7.3)	(5)	(5)	(44)	
LSD (P=0.05)	NS	0.6	0.5	NS	0.4	0.7	0.7	3.6

*Data subjected to square root transformation. Values in parentheses are original.
NS–Not Significant.

Table 2. Effect of pea cultivars and weed control methods on growth at 60 DAS and seed yield of pea

Treatment	Plant dry weight (g plant^{-1})	Leaf area (cm^2 plant^{-1})	Light interception (%)	Seed yield (kg ha^{-1})			
				Weedy	1 HW	Mean	Reduction in yield over 1 HW (%)
Cultivars							
JP 885	11.73	1156	95.8	3080	3153	3117	2.32
Arkel	11.80	644	73.3	281	578	428	51.04
Green pearl	5.37	667	80.0	1403	1728	1566	18.81
JP 180	11.75	995	86.0	2558	3228	2893	20.76
KMR 6	10.62	1130	93.4	1485	1731	1608	14.21
DPP 62	5.25	465	50.7	448	970	709	53.81
JM 6	10.58	1095	89.9	2628	2996	2812	12.28
LSD (P=0.05)	1.08	208	11.6	Cultivars x Weed control–NS	-	335	
Weed control							
Weedy check	9.92	1066	78.63			1698	
Hand weeding at 30 DAS	11.39	1121	83.97			2055	
LSD (P=0.05)	0.57	NS	NS			179	

NS–Not Significant.

and pH 6.7. The crop was sown in rows 30 cm apart on October 31, 2001. Hand weeding was done at 30 days after sowing (DAS). Populations and dry matter of weeds were recorded at 60 DAS. The data on number of weeds were subjected to square root transformation using $(\sqrt{X+0.5})$. Leaf area of pea cultivars was measured with LI-3100 area meter at 60 DAS. The light intensity was measured by Luxmeter (FX-101) at 8.30-9.00 A. M., 1.00 -1.30 P. M. and 4.00-4.30 P. M. and average intensity was calculated. Percentage light interception was calculated by using the following formula :

$$\% \text{ Light interception} = \frac{\text{Light at the top of canopy- Light at base of crop}}{\text{Light at the top of canopy}} \times 100$$

The field was infested with *Vicia sativa* L. (21.9%), *Lathyrus aphaca* L. (18.7%), *Chenopodium album* L. (13.4%), *Phalaris minor* Retz. (13.1%), *Avena sterilis* var. *ludoviciana* Dur. (13.7%) and others (19.1%). Different varieties varied significantly in suppressing weed population (Table 1). Irrespective of the weed species, the lowest population was recorded in JP 885. Other promising varieties which recorded lower weed population were JP 180, KMR 6 and JM 6. The total weed population was also reduced significantly in JP 885 as compared to DPP 62. Weed dry matter at 60 DAS in JP 885 (24.2) being at par with JP 180 (26.1), Arkel (28.2), KMR 6 (29.7) and JM 6 (30.1) was significantly lower as compared to DDP 62 (43.4) and Green pearl (61.5). The maximum weed dry matter (222 g) was recorded with DPP 62 followed by Green pearl (161 g). The lowest population and dry matter of weeds under JP 885 could be attributed to its higher leaf area and dry weight resulting in higher light interception (Table 2). Hand weeding at 30 DAS significantly reduced the population and dry matter of weeds compared to weedy check. Pea cultivars JP 885, Arkel and JP 180 were at par with respect to their dry weight at 60 DAS. JP 885 being at par with KMR 6, JM 6 and JP 180 produced significantly higher leaf area per plant as compared to other varieties. Maximum light (95.8%) was intercepted with JP 885 which was at par with KMR 6 (93.4%), JM 6 (89.9%) and JP 180 (86.0%) but significantly superior to rest of the varieties. Higher light interception in these varieties was due to higher leaf area. The highest seed yield (3117 kg) was recorded with JP 885 which was at par with JP 180 (2895 kg) and JM 6 (2812 kg) but significantly superior to other varieties. Though the interaction effect between cultivars and weed control for seed yield was not significant, but JP 885 (2.32%) followed by JM 6 (12.28%), was less affected by weeds as compared to other varieties. This study clearly indicated that pea variety JP 885 had very good ability to suppress weeds besides its higher yield potential and hence, could be included in an integrated weed management programme.

REFERENCES

Lemerle, D., B. Verbeek and S. N. Coombe, 1995. Losses in grain yield of winter crops from *Lolium rigidium* competition against weeds. *Weed Res.* **35** : 503-509.

Mishra, J. S. and V. M. Bhan, 1997. Effect of cultivar and weed control on weed growth and yield of pea *(Pisum sativum). Indian J. Agron.* **42** : 316-319.