

## Influence of Weed Control and Sulphur Nutrition on Weed Dynamics and Productivity of Pea (*Pisum sativum* L.)

Ramesh Verma, V. Nepalia and S. K. Kumawat

Department of Agronomy

Maharana Pratap University of Agriculture & Technology, Udaipur-313 001 (Rajasthan), India

Pea is one of the popular winter season pulse crops in India. Amongst various factors restricting its higher productivity, insufficient control of weeds is considered to be of prime importance. Due to slow growth of the crop at initial stage, weeds quickly occupy the inter-row space, compete with the crop and reduce yield. First 15-60 DAS have been considered critical for crop-weed competition in this crop (Tripathi *et al.*, 2001). Though on small fields manual weeding can be adopted for weed control but mechanical injury to this tender crop may occur. In intensive and multiple cropping system, the labour demand and cost are increasing at rapid rate thus warranting the use of either pre-plant or pre-emergence herbicides to augment pea cultivation. On the other hand, sulphur deficiency in many parts of the country has become very common, which hampers production of protein rich pulse crops. In view of these facts, a field experiment was undertaken to assess effect of herbicides and sulphur application on weeds and productivity of pea crop.

A field experiment was conducted during **rabi** 1998-99 and 1999-2000 at Instructional Farm, Maharana Pratap University of Agriculture & Technology, RCA, Udaipur. The soil of the experimental site was clay loam in texture, normal in reaction and calcareous. It was medium in available nitrogen (394.2-405.5 kg N ha<sup>-1</sup>), high in available phosphorus (27.5-31.4 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup>) and potassium (313-325 kg K<sub>2</sub>O ha<sup>-1</sup>) and low in available sulphur (9.4-9.5 ppm SO<sub>4</sub><sup>-2</sup>). The treatments consisted of weedy, two hand weedings at 30 and 45 DAS, fluchloralin at 1.0 kg ha<sup>-1</sup> PPI and pendimethalin at 0.75 kg ha<sup>-1</sup>, oxadiazon at 0.5 kg ha<sup>-1</sup> and alachlor at 1.5 kg ha<sup>-1</sup> as pre-emergence and four levels of sulphur (0, 30, 60 and 90 kg ha<sup>-1</sup>). All the herbicides were sprayed

with knapsack sprayer fitted with flat fan nozzle using 650 l of water per ha, while sulphur was applied as basal dose through ground gypsum as per treatment alongwith uniform dose of 20 kg N and 40 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup>. The experiment was laid out in randomized block design with four replications. Sowing of pea cultivar Azad P-1 was done on November 14, 1998 and October 29, 1999.

The weed flora of the experimental site consisted of *Chenopodium album*, *C. murale*, *Melilotus indica*, *Spergula arvensis*, *Phalaris minor*, *Cynodon dactylon*, etc.

The density of weeds was significantly reduced due to different weed control treatments (Table 1). Oxadiazon caused more reduction in weeds. Minimum weed dry matter was observed in hand weeded plots. The superiority of hand weeding over herbicides could be attributed to the fact that second weedings done at 45 DAS did not allow weeds to accumulate sufficient biomass. Two hand weedings done at 30 and 45 DAS accounted for highest efficiency (66.7%) followed by oxadiazon (53.5%).

Sulphur application had no effect on weed density. Weed dry matter was increased due to sulphur doses.

Higher pods plant<sup>-1</sup>, seeds pod<sup>-1</sup> and test weight were registered by controlling weeds with oxadiazon (28.9, 5.8 and 189.9 g). Pea seed yield increased significantly over weedy due to weed control treatments. The highest seed yield (2265 kg ha<sup>-1</sup>) was obtained due to oxadiazon. Fluchloralin and pendimethalin were next best and exhibited superiority to alachlor and hand weeding. Similarly, highest straw yield (5629 kg ha<sup>-1</sup>) was obtained due to oxadiazon.

Positive effect of sulphur on yield attributes and yield of pea was recorded. The pods plant<sup>-1</sup>,

Table 1. Effect of weed control and sulphur application on total weed density, total weed dry matter, yield attributes and yield of pea

Treatment	Weed density (No. m <sup>2</sup> ) at 60 DAS	Weed dry matter (kg ha <sup>-1</sup> ) at 60 DAS	Pods plant <sup>-1</sup>	Seeds pod <sup>-1</sup>	Test weight (g)	Seed yield (kg ha <sup>-1</sup> )	Straw yield (kg ha <sup>-1</sup> )
<b>Weed control</b>							
Weedy	12.54 (158)	754.3	10.7	2.8	170.4	622	1557
HW 30 and 45 DAS	10.24 (105)	251.3	24.8	5.1	182.0	1579	3943
Fluchloralin	7.86 (62)	444.7	26.8	5.6	188.1	2022	5005
Pendimethalin	7.72 (63)	444.3	26.5	5.3	186.9	1999	4859
Oxadiazon	6.12 (40)	350.9	28.9	5.8	189.9	2265	5629
Alachlor	8.88 (81)	500.3	26.2	5.0	185.5	1759	4273
LSD (P=0.05)	0.68	30.77	1.4	0.3	3.2	101	101
<b>Sulphur (kg ha<sup>-1</sup>)</b>							
0	9.16 (90)	386.6	19.6	3.8	176.7	1423	3619
30	9.04 (86)	442.4	23.0	4.8	182.6	1673	4104
60	8.51 (80)	492.5	25.8	5.4	186.8	1839	4499
90	8.76 (83)	509.0	26.7	5.7	188.6	1896	4622
LSD (P=0.05)	NS	25.13	1.2	0.3	2.6	83	82

Figures in parentheses are original values.

NS-Not Significant.

seeds pod<sup>-1</sup> and test weight registered significant increase by raising S level upto 60 kg ha<sup>-1</sup>.

There was no interaction between weed control treatments and sulphur dose with regard to weed growth and crop yield.

#### REFERENCE

- Tripathi, S. S., Rohitashv Singh, Govindra Singh and Rajesh Kr. Singh, 2001. Study on crop-weed competition in tendrill pea (*Pisum sativum*) under Tarai of Uttaranchal. *Indian J. Weed Sci.* 33 : 46-48.