

Seed Quality as Affected by Planting Patterns and Weed Control Treatments in Garden Pea

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Pea is one of the most important vegetable crops grown all over India. It contains high percentage of digestible proteins, carbohydrates, sugars, vitamins and minerals and is considered vital for a country like India where majority of people are vegetarian. But the productivity of this crop is very low in India (1000 kg/ha) as compared to France (4406 kg/ha) and Denmark (3439 kg/ha) [1]. The poor seed quality may be one of the reason for this low productivity. Various agronomic practices play important role for determining the quality of seed but very meagre information is available on this crop. Therefore, present study was undertaken to find out the influence of planting methods and different weed control treatments on seed quality of pea.

The investigations were carried out at Seed Technology Farm, Punjab Agricultural University, Ludhiana during *rabi* 2003-04 and 2004-05. The pea crop was sown on first week of November in both the years. The widely cultivated variety Matar Ageta 6 of pea was taken for the investigations. Treatments comprised of four planting patterns partial ridge planting (30 cm), bed planting (60 cm with two rows in each bed), flat planting with 30 cm row to row spacing and flat planting with paired rows 45:15cm spacing and six weed control treatments (pendimethalin 0.75 kg a.i./ha; pendimethalin 0.50 kg a.i./ha followed by hand weeding 30 DAS; trifluralin 1.25 kg a.i./ha; trifluralin 0.75 kg a.i./ha followed by hand weeding 30 DAS; three hand weedings at 30 days interval and unweeded control. Pendimethalin was

applied as pre-emergence whereas trifluralin was applied as pre plant. The treatments were tested in split plot design with three replications. The other cultural practices and plant protection measures were carried out as per PAU recommendation. The observations were recorded on number of pods per plant, 100 seed weight, seed germination and seed vigour. The 100 seed weight was estimated from three samples, each drawn from the seed lot of each treatments. The seed germination test was done using between paper method (BP method) and as per ISTA [2] whereas seed vigour was calculated by length of seedlings (root-shoot length) \times 100.

Highest number of pods per plant (18.71) was recorded under manual weeding which was at par with trifluralin @ 0.75 kg a.i./ha + HW (18.15) and pendimethalin @ 0.50 kg a.i./ha + HW (18.14) (Table 1). The maximum number of pods per plant in these treatments was due to the least competition with weeds for nutrients and other inputs. Prakash *et al.* [3] also reported similar results in garden pea. The numbers of pods per plant were maximum under bed planting (17.09) which was significantly superior to other planting methods. It may be due to the better plant growth and less competition by weeds (*Chenopodium album*, *Medicago denticulate*, *Rumex dentatus*, *Sisymbrium irio*, *Fumaria parvijlora*, *Asphodelus tenuifolius*, *Anagallis arvensis*, *Melilotus indica*, *Avenua Indovicinana*, *Phalaris minor* etc.) for inputs and light etc. which resulted in the higher productivity in this treatment.

The 100 seed weight (g) was not significantly influenced by planting patterns (Table 1). Among herbicidal treatments trifluralin @ 0.75 kg a.i./ha + hand weeding recorded highest 100 seed weight (28.19 g) followed by hand weeding (28.03 g) and pendimethalin @ 0.50 kg/ha + hand weeding (27.24 g). The higher seed weight obtained in these three treatments could be due to the fact that these treatments effectively controlled the weeds, thereby resulting in better crop growth, which ultimately favourably influenced the seed development. Kumar *et al.* [4] also reported that trifluralin @ 1.0kg a.i./ha + hand weeding significantly improved the seed weight in soybean.

Maximum seed germination (92.16%) was obtained from the treatment where trifluralin @ 0.75 kg a.i./ha + hand weeding was applied followed by pendimethalin @ 0.50 kg a.i./ha + hand weeding (91.33%) and hand weeding (90.66%) which were found to be statistically at par with each other (Table 2). On other hand, seed germination was reduced drastically in unweeded

plots. Planting patterns did not have any significant effect on seed germination of pea.

Seed vigour is an index of seed germination and of seedling vigour. It is evident from Table 2 that significant differences exist among different weed control treatments. The hand weeding recorded maximum seed vigour (2077.58) followed by trifluralin @ 0.75 kg a.i./ha + hand weeding (1966.95) and pendimethalin @ 0.50 kg a.i./ha + hand weeding (1895.95). On the other hand, planting pattern did not have any significant effect on the seed vigour. The higher seed vigour with hand weeding and other herbicide treatments could be due to the more seed germination and also more seedling length in these treatments as compared to weedy check.

From the study, it is concluded that three hand weedings at 30 days interval, application of trifluralins @ 0.75 kg a.i./ha + hand weeding (30 DAS) and pendimethalin @ 0.50 kg a.i./ha + hand weeding (30 DAS) found effective for the

Table 1. Influence of planting patterns and herbicide treatments on 100 seed weight(g) and number of pods per plant in pea cv Malar ageta-6 (pooled data of year 2003-04 and 2004-05)

Treatments	100 seed weight (g)					Pods/plant					
	Partial ridge planting	Bed planting	Flat planting	Flat planting (paired row)	Mean	Partial ridge planting	Bed planting	Flat planting	Flat planting (paired row)	Mean	
Pendimethalin 0.75 kg a.i./ha	24.16	25.20	24.03	24.32	24.43	16	56	17.51	15.34	15.03	16.11
Pendimethalin 0.50 kg a.i./ha + Handweeding	26.83	28.10	27.61	26.42	27.24	18.35	19.04	17.66	17.51	18.14	18.14
Trifluralin 1.25kg a.i./ha	25.26	25.45	25.08	24.36	25.04	17.01	17.54	15.26	15.35	16.29	16.29
Trifluralin 0.75 kg a.i./ha + Handweeding	28.03	28.79	27.61	28.34	28.19	18.54	18.86	17.91	16.83	18.15	18.15
Hand weeded	28.05	28.72	27.58	27.76	28.03	19.10	19.31	19.19	17.24	18.71	18.71
Unweeded	19.99	20.19	19.82	19.89	21.99	9.88	10.24	10.28	9.84	10.06	10.06
Mean	25.39	26.08	25.29	25.18	25.48	16.57	17.09	15.94	15.74	16.33	16.33
C.D (p=0.05)											
Planting pattern	N.S					0.83					
Weed control treatments	2.06					1.51					
Planting pattern x weed control treatment	N.S					NS					

Table 2. Influence of planting patterns and herbicide treatments on seed germination (%) and seed vigour in pea cv Matar ageta-6 (pooled data of year 2003-04 and 2004-05)

Treatments	Seed germination (%)					Seed vigour				
	Partial ridge planting	Bed planting	Flat planting	Flat planting (paired row)	Mean	Partial ridge planting	Bed planting	Flat planting	Flat planting (paired row)	Mean
Pendimethalin 0.75 kg a.i/ha	90.83	89.33	89.33	85.16	88.78	1834.66	1865.83	1763.33	1814.49	1818.58
Pendimethalin 0.50 kg a.i/ha + Hand weeding	94.50	90.33	92.00	88.49	91.33	1937.66	903.49	1879.33	1863.33	1895.95
Trifluralin 1.25kg a.i/ha	88.49	89.00	86.50	85.33	87.33	1792.33	1752.16	1753.83	1655.50	1737.45
Trifluralin 0.75 kg a.i/ha + Hand weeding	90.50	93.00	93.00	92.16	92.16	1966.49	008.66	1958.00	1934.66	1966.95
Hand weeded	92.00	93.50	89.00	88.16	90.66	2135.49	2173.33	2049.44	1911.99	2077.58
Unweeded	82.00	81.83	80.00	79.00	80.77	1609.16	1651.66	1596.50	1587.33	1611.16
Mean	89.21	89.58	88.27	86.38	88.36	1879.30	1892.52	1840.08	1794.55	1851.62
C.D. (p=0.05)										
Planting pattern	NS	NS								
Weed control treatments	4.82	101.04								
Planting pattern x weed control treatment	NS		NS	NS						

production of good quality seed whereas different planting patterns had non significant effect on these characters. Since hand weeding is labour intensive, hence costly, therefore herbicide application should be followed for quality seed production in this crop.

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