



Short Note

Influence of Picking on Seed Yield and Seed Quality of Petunia

K. Natarajan* and P. Srimathi

Department of Seed Science and Technology
Tamil Nadu Agricultural University, Coimbatore-641 003

The common harvesting technique adopted in crops with continuous flowering habit is the harvesting of pods/produce in pickings with definite intervals, as one harvest could not be practiced in these crops and will lead to loss of seed yield and quality characters. Petunia is one such crop where the pods are highly dehiscent and spill out seeds immediately after maturation. But the harvesting period extends from 50 -60 days due to the indeterminate growth habit of the plant. Hence a study was formulated to harvest the seeds in pickings as the retention of pods on plants even for a single day leads to heavy shattering loss in this ornamental crop.

Bulk crop of petunia cv. Mix was raised during June 2002 in the botanical garden, Tamil Nadu Agricultural University, Coimbatore. In the bulk crop, at the time of flowering ten different plants were randomly selected and harvested individually once in two days upto the fruiting period of 50 days. The treatments which constitute 25 pickings were evaluated for the following seed yield and seedling quality characters viz., weight pod⁻¹ (g), number of seeds pod⁻¹, seed weight pod⁻¹ (g), seed yield picking⁻¹ (g), 100 seed weight (mg) (ISTA, 1999), germination (%) (ISTA, 1999), root and shoot length (cm), drymatter production (mg 20 seedlings⁻¹) and vigour index (Abdul Baki and Anderson, 1973). The data gathered were analysed statistically adopting the procedure described by Gomez and Gomez (1984).

Highly significant differences were obtained due to picking for the evaluated seed and seedling

quality characters except for shoot length which was non significant due to pickings. The results expressed that yield attributing characters viz., pod weight (g), number of seeds pod⁻¹, seed weight pod⁻¹(g), seed yield picking⁻¹(g) decreased with advances in picking. The reduction from first to last picking was found to be 33 per cent for pod weight, 29 per cent for number of seeds pod⁻¹, 31 per cent for seed weight pod⁻¹ and 10 per cent for seed yield picking⁻¹ (Table 1). The higher yield of earlier pickings might be due to vigorous growth of the crop at early stages, where the higher photosynthetic rate have resulted in the higher nutrient flow that enhanced the production of seed in higher number with more specific gravity (Pandey and Sinha, 1999). In the present study, the seed number pod⁻¹ was the highest in first 15 pickings and it gradually decreased and recorded the least with the 25th picking which might be due to the depletion of food materials at later stages of crop growth or decrease in the recovery of normal sized seed as picking advances (Lawn and Brown, 1974) or the reduced size and weight of the seed (Dsely, 1957; Townsend, 1972).

The seed and seedling quality characters such as 100 seed weight, germination, root length, shoot length, drymatter production and vigour index (Table 2) were also decreased with advances in picking for the reasons discussed elsewhere. The first ten pickings recorded more than 90 per cent germination, which had the highest with 99 per cent at 1st picking. However, even in the last picking the germination recorded was 83 per cent, though the seed yield picking⁻¹

*Corresponding author

Table 1. Influence of picking on pod and seed characteristics

Pickings	Weight pod ⁻¹ (g)	Number of seeds pod ⁻¹	Seed weight pod ⁻¹ (g)	Seed yield picking ⁻¹ (g)	100 seed weight (mg)
1	0.1135	786	0.0484	0.6292	8.8
2	0.1347	950	0.0587	0.6180	8.9
3	0.1286	875	0.5300	0.8147	9.0
4	0.1375	856	0.0688	0.9127	8.8
5	0.1225	920	0.0625	0.7187	8.8
6	0.1081	850	0.0688	0.6695	8.7
7	0.1024	810	0.0570	0.6230	8.6
8	0.1145	797	0.0557	0.6521	8.6
9	0.1120	814	0.0520	0.6634	8.5
10	0.1095	864	0.0536	0.6307	8.6
11	0.1136	775	0.0456	0.6284	8.4
12	0.1085	736	0.0525	0.5996	8.5
13	0.1234	810	0.0472	0.6125	8.5
14	0.1120	740	0.0428	0.6657	8.6
15	0.1084	670	0.0467	0.6325	8.5
16	0.1038	685	0.0447	0.6185	8.4
17	0.1076	720	0.0406	0.6023	8.4
18	0.0987	708	0.0395	0.5843	8.4
19	0.1020	645	0.0440	0.5921	8.2
20	0.0938	777	0.0385	0.5763	8.2
21	0.0928	626	0.0375	0.5807	8.0
22	0.0827	589	0.0347	0.5792	8.0
23	0.0863	610	0.0365	0.5830	7.8
24	0.0820	575	0.0352	0.5834	7.8
25	0.0785	560	0.0335	0.5694	7.5
Mean	0.1047	750	0.0479	0.6353	8.4
CD (P = 0.05)	0.0050	7	0.0004	0.0040	0.2

was the minimum (0.5694 g). This situation exposed that, in petunia the problem of seed germination was minimum as the seed setting is easier due to the self pollination nature of this solanaceous crop. Ovcharov (1977) also

discussed that the higher germination percentage of seeds from the earlier pickings might be due to better period of seed formation in the plants.

The evaluation made on the vigour attributes of seeds also expressed that though the vigour

Table 2. Influence of picking on seed and seedling quality characteristics

Pickings	Germination (%)	Root length (cm)	Shoot length (cm)	Dry matter production (mg 20 seedlings ⁻¹)	Vigour index
1	99 (85.26)	0.95	2.00	2.0	198
2	98 (83.33)	1.00	2.01	2.0	196
3	98 (82.05)	0.99	1.98	2.0	196
4	96 (79.13)	1.00	1.95	1.9	182
5	96 (78.72)	0.99	1.95	1.9	187
6	98 (82.05)	1.00	1.93	2.0	196
7	95 (77.96)	0.99	1.92	1.9	181
8	95 (77.96)	0.99	1.89	2.0	190
9	95 (77.51)	1.00	1.91	2.0	190
10	95 (77.23)	1.01	1.89	1.9	181
11	96 (79.13)	0.97	1.87	2.0	192
12	95 (77.12)	0.99	1.82	2.0	190
13	95 (77.25)	0.94	1.83	1.9	181
14	93 (74.89)	0.88	1.82	1.8	167
15	92 (73.65)	0.91	1.79	1.8	166
16	92 (73.59)	0.87	1.83	1.7	156
17	89 (70.74)	0.88	1.76	1.8	160
18	91 (72.61)	0.83	1.88	1.6	146
19	91 (72.56)	0.84	1.78	1.8	164
20	90 (71.96)	0.82	1.75	1.6	144
21	88 (69.74)	0.83	1.69	1.6	141
22	87 (68.85)	0.81	1.67	1.4	122
23	86 (68.06)	0.79	1.65	1.4	120
24	85 (67.28)	0.76	1.64	1.5	128
25	83 (65.70)	0.75	1.57	1.3	108
Mean	93 (75.38)	0.89	1.83	1.8	167
CD (P = 0.05)	2.67	0.12	NS	0.3	3

(Figures in parantheses indicate arc sine values)

characters reduced with picking as that of germination, the reduction in vigour was higher which was 45 per cent for the indexed vigour

values. It is further evident with the present study, that the seed weight, germination per cent, drymatter production and vigour index potentials

of the seeds were higher with first ten harvests in line with the view of Fehr and Weber (1968) due to the better mobilization of reserved food materials, which could have been supplied by the mother plant for the proper development of seeds, highlighting that for obtaining high quality seed with higher seed recovery, pods should be harvested from earlier pickings upto 40 days in alternate days.

Thus the study revealed that in petunia 1.)Seed recovery and seed quality characters decreases with advances in picking 2.)The germination among the pickings varied from 99 to 83 per cent. 3.) For economic collection, pods could be harvested upto 40 days on alternate days.

Reference

Abdul-Baki, A.A. and Anderson, J.D. 1973. Vigour determination in soybean seed by multiple criteria. *Crop Sci.*, **13**: 630-633.

Dsely, 1957. Vigour tests. *Proc.Ass.Off.Seed Anal.*, **47**: 176-182.

Fehr, W.R. and Weber, C.R. 1968. Mass selection by seed size and specific gravity in soybean population. *Crop Sci.*, **8**: 551-554

Gomez, K.A. and Gomez, A.A. 1984. Statistical procedures for agricultural research of legumes seeds of different density. *Agriculture*, **41**: 47-56

ISTA, 1999. International Rules for Seed Testing. *Seed Sci. & Technol. (Supplement Rules)*, **27**: 25-30.

Lawn, R.J. and Brown, W.A. 1974. Symbiotic nitrogen fixation in soybean I. Effect of photosynthetic source sink manipulations. *Crop Sci.*, **14**: 11-16.

Ovcharov, K.E. 1977. Effect of the conditions of seed formation and storage on germination (p-7). Physiological basis for seed germination. American Publishing Co.Pvt.Ltd.,New Delhi.

Pandey, S.N. and Sinha, B.K. 1999. Plant physiology. Vikas Publishing House Pvt Ltd, New Delhi, p. 282-295

Townsend, C.E. 1972. Influence of seed size and depth of planting on seedling emergence of two milk vetch species. *Agron. J.* 627-630.

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