

Seed Quality Status of Vegetable Seeds Produced by Farmers as well as Public and Private Organisations

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Majority of the demand of vegetable seed is contributed by the highly unorganized seed sector where seed traders directly purchase the seed from seed growers and distribute under various trade names, thus many a times supplying a poor quality or sub-standard seed. The efforts made for training and encouraging farmers to adopt vegetable seed production as a subsidiary occupation have not met with desired success due to various reasons. The present investigations, therefore, were conducted to assess the overall quality of farmers' saved seed, if any, as well as seed produced by various public and private organizations. The study also highlights the various reasons given by the number of farmers for not adopting the vegetable seed production.

In order to assess the quality of seed, 378 seed samples of various vegetables/varieties were collected from all over the Punjab during 2001-02, 2002-03 and 2003-04 and tested for seed quality. Out of these samples, 23 belonged to farmers' saved seed and rest to PAU, Seed Farms and public and private organizations (Durga Seeds, Kisan Seed Farm and dealers trading in seeds). Seeds of 22 crops (varieties) viz. ash gourd (PAC-3); okra (Pb.-7, Pb.-8, Pb.Padmini); bitter gourd (Pb.-14, Local); bottle gourd (Pb. Komal); brinjal (Jamuni Gola, Pb. Neelam, Neela Gola, Pb. Barsati, BH-1); carrot (Selection-21, Deep red); cauliflower (Pusa 1, Katki, Early

kumari); chilli (CH-1, C-3, MS 12, Century, Pb. Surakh, Chandarmukhi, Surajmukhi, Local); cucumber (Local); long melon (Pb.-1); methi (ME-150); methi Kasuri (Local); muskmelon (Pb. Sunehari, Hara Madhu, Pb. Hybrid); onion (Red Round, Pb. White, Pb. Naroya, Pb.48, Pb Red Round, Pb. Selection, Nasik Red); palak (Pb. Green); pea (E-6, Arkel, Pb.87, Pb.88, mithi Phali, Local); radish (Pb. Pasand, Pb. Safed, Pusa Chetaki); summer squash (Pb. Chappan kadi); Tinda (S-48); tomato (Pb. Upma, Pusa Ruby, Pb. Kesari, Pb. Chhuara, Castle Rock, VFN-8); turnip (L-1) and water melon (Sugar Baby) were collected. All the seed samples were subjected to seed germination and seed mycoflora analysis as per the ISTA rules [1].

The studies indicate (Table 1) that in majority of the crops, the quality of the seeds produced by the public and private seed organizations was good and more than 80 per cent samples met the Minimum Seed Certification Standard (MSCS). In rest of the sample, the germination was marginally lower than the MSCS. Nevertheless, majority of the samples of farmer saved seed (23) available for 7 crops (brinjal, carrot, cauliflower, chillies, onion, radish and tomato) were poor in germination. Various fungi like *Alternaria* spp., *Aspergillus niger*, *A. flavus*, *Colletotrichum* spp., *Fusarium* spp., *Rhizopus* spp. were found to be associated with the seed. One sample of farmer saved seed of tomato was

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Table 1. Seed quality status of vegetable seeds in Punjab

S.No.	Crop	Type of seed	No. samples	% samples having germination above MSCS	Germination (%)		Mycoflora (%)	
					Range	Average	Range	Average
1.	Ash gourd (<i>Benincasa cerifera savi.</i>)	A	2	100.0	67.0-81.3	74.2	7-16	11.5
2.	Okra (<i>Abelmoschus esculentus</i> (L.) Moench.)	A	41	85.7	51.3-92.3	77.5	0-71	14.9
3.	Bitter Gourd (<i>Momordica charantia</i> L.)	A	8	75.0	32.0 -95.0	88.5	12-12	12.0
4.	Bottle gourd (<i>Lagenaria siceraria</i> (Molina) Standl.) (Syn. <i>L. lucantha</i> Rusby)	A	13	100.0	63.6- 80.6	73.1	9-25	15.5
5.	Brinjal (<i>Solanum melongena</i> L.)	A B	10 4	50.0 0.0	16.0-85.0 2.0-51.0	43.0 18.0	0-27 1-56	11.4 15.8
6.	Carrot (<i>Daucus carota</i> L.)	A B	23 1	62.5 0.0	23.0-71.0 59.0 -59.0	43.5 59.0	0-68 12-12	36.6 12.0
7.	Cauliflower (<i>Brassica oleracea</i> var. <i>botrytis</i> L.)	A B	4 1	75.0 100.0	41.0-86.0 81.0-81.0	67.8 81.0	27-62 42-42	52.5 42.0
8.	Chilli (<i>Capsicum frutescens</i> L.)	A B	28 5	77.8 0.0	11.0-92.0 0.0 -46.6	67.5 20.8	0-172* 2-117*	47.3 47.0
9.	Cucumber (<i>Cucumis sativus</i> L.)	A	2	100.0	78.6-86.6	82.6	13-13	13.0
10.	Long melon (<i>Cucumis melo</i> L. var <i>utilissimus</i> Duth. & Full.)	A	6	100.0	72.0 -90.6	67.9	0-34	14.2
11.	Methi (<i>Trigonella foenumgraecum</i> L.)	A	15	100.0	90.0-91.3	90.4	7-16	10.7
12.	Methi Kasuri (<i>Trigonella corniculata</i> L.)	A	16	50.0	46.6 -74.6	56.1	8-14	12.0
13.	Muskmelon (<i>Cucumis melo</i> L.)	A	24	91.7	32.3-91.6	80.5	0-15	7.0
14.	Onion (<i>Alium cepa</i> L.)	A B	29 7	86.2 14.3	45.3 -95.0 18.0-71.0	78.9 48.8	0-59 16-52	21.8 27.1
15.	Spinach (<i>Spinacea oleracea</i> L.)	A	13	100.0	63.0-91.6	78.5	9-30	17.5
16.	Pea (<i>Pisum sativum</i> L.)	A	32	88.2	62.0 -92.0	86.0	8-46	21.8
17.	Radish (<i>Raphanus sativus</i> L.)	A B	30 2	96.7 100.0	40.0 -93.0 91.3-92.0	86.4 91.7	7-20 9-13	12.6 11.0
18.	Summer squash (<i>Cucurbita pepo</i> Duch.)	A	6	70.0	37.3 -84.0	61.8	10-28	17.8

S.No. Crop	Type of seed	No. samples	% samples having germination above MSCS	Germination (%)		Mycoflora (%)	
				Range	Average	Range	Average
19. Tinda (<i>Praecitrullus fistulosus</i> Pang.)	A	7	85.8	44.0-91.6	78.1	0-26	9.6
20. Tomato (<i>Lycopersicon esculentum</i> Mill.)	A	17	76.9	22.0 -95.0	72.5	0-21	5.9
	B	3	0.0	0.0-12.6	4.2	58-104*	84.3
21. Turnip (<i>Brassica rapa</i> L.)	A	13	75.0	52.0-91.3	73.6	1-29	11.0
22. Water melon (<i>Citrullus lanatus</i> (Tunb.) Matsumura et. Nakai)	A	16	81.3	28.3 -89.3	60.1	1-18	9.4
Total	A	355	80.6	0.0 -95.0	72.2	0-172	17.6
	B	23	17.4	0.0 -92.0	46.2	1-117	34.2

MSCS : Minimum Seed Certification Standards; A : Seed Collected from Public & Private seed producing organizations; B : Farmer's Saved Seed; * : Some of the seeds were infected with more than one microorganism thus, percentage above 100; **Associated mycoflora:** *Alternaria* spp., *Aspergillus niger*, *A. flavus*, *Colletotrichum* spp., *Fusarium* spp., *Rhizopus* spp.

having very high (84.3 %) incidence of mycoflora (species of *Fusarium*, *Aspergillus* and *Rhizopus*) as compared to other crops. The association of such mycoflora has been reported in vegetable crops by various workers [2-7].

Out of 160 farmers interviewed, only 34(21.25%) seemed to be versed with the vegetable seed production activities and cited various reasons for not adopting the vegetable seed production viz. i) vegetable seed production is a specialized job and has problems in maintaining long isolation distances, ii) extremely risky if caught in rains at the time of maturity and iii) lack of organized marketing. However, rest of the 126 (78.75 %) farmers felt that selling green vegetable was more easy and less risky.

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