

## Seed Vigour as Influenced by Truss Position in Tomato

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Variability in tomato (*Lycopersicon esculentum* Mill) fruit, weight and seed characteristics at different positions on the plant during development has a significant impact on seed and fruit production. [1]. In spite of many improvements and adopted advances regarding cultivation, less emphasis has been given to study the relationship of truss position variation in tomato on quality and quantity of seed production. Therefore, a study was conducted to investigate the effect of relative position of fruit truss on a branch and fruits in the truss on seed vigour and study the relationship of seed vigour with fruit vigour.

Two tomato varieties, Punjab Upma and Castle Rock were used as study material for present investigation. Fifty plants of each variety were planted during rabi season at the Vegetable Research Farm of PAU, Ludhiana. The primary branches for truss positions on the plants were selected and the first three fruits in each cluster of fruits were harvested separately in both the varieties. Observations were recorded on inter and intra truss variation for different seed vigour parameters. Seeds were germinated on germination paper towels at  $25^{\circ}\pm 1^{\circ}\text{C}$  as per ISTA rules [2]. The germination percentage was calculated on the basis of number of normal seedlings. Seed vigour was determined in terms of seedling length, seedling dry weight, vigour index, seed yield, 1000-seed weight and fruit weight.

In both the varieties (Castle Rock and Punjab Upma) seed vigour was significantly affected by truss position (Table 1). Fruits from first truss yielded maximum number of seed, fruit weight,

thousand seed weight and vigour index, in both the varieties. This may be due to the close proximity of the first truss to the, source, which has a better share of initially translocated food material [1]. The observation on maximum 1000-seed weight in variety Castle Rock in the first truss is in agreement with Aya et al. [3]. Therefore, vigour is likely to be more in the first truss in this variety. In both the varieties the first truss gave higher vigour index than either of second or third. It may be due to higher accumulation of nutrients and proper development of embryo and other essential parts of the seed. Pattern of intra truss variation in both the varieties was similar, irrespective of the truss position for all the parameters studied (seed yield, fruit weight, 1000-seed weight and seedling dry weight). The first fruit gave significantly higher seed yield, fruit weight, 1000-seed weight and seedling dry weight in both the varieties. The difference between fruit weight of proximal and distal fruits have been reported earlier [1]. Seedling length and vigour index followed the similar trend in variety Punjab Upma. However in variety Castle Rock the three fruit positions studied were at par for these two characters. Among all the characters studied, germination percentage was not affected either by truss or fruit position. These results are in agreement with the findings of Aya et al. [3].

Data on seed production indicated that the seeds of the first truss on a primary branch were better than from other truss on the same branch and the seeds of the first fruit within a truss were better than that from other fruit positions within the same truss. Correlation matrix of different

Table 1. Effect of truss and fruit position on seed vigour in tomato varieties

Truss position	Fruit position	Seed yield/fruit (mg)		Fruit weight (g)		1000-seed weight (g)		Germination (%)		Seedling length (mm)		Dry weight (mg)		Vigour index	
		CR	PbU	CR	PbU	CR	PbU	CR	PbU	CR	PbU	CR	PbU	CR	PbU
I	1	476	393	88.52	77.85	3.49	3.79	98	96	15.12	13.28	2.936	2.60	1485	1281
	2	382	284	70.39	56.09	3.37	3.63	97	94	14.93	12.85	2.784	2.34	1457	1217
	3	342	276	64.23	54.76	3.24	3.41	96	94	14.78	12.74	2.730	2.25	1432	1205
	Mean	399	317	74.38	62.90	3.37	3.61	97	95	14.94	12.96	2.816	2.39	1458	1235
II	1	467	383	86.35	75.99	3.26	3.69	97	95	14.95	13.24	2.877	2.41	1459	1264
	2	368	276	68.25	54.65	2.97	3.53	95	94	14.63	12.78	2.711	2.24	1399	1212
	3	287	243	54.69	47.97	2.59	3.30	95	94	14.65	11.03	2.624	2.17	1405	1044
	Mean	374	301	69.8	59.54	2.94	3.50	96	95	14.74	12.35	2.737	2.27	1421	1173
III	1	451	374	83.43	74.20	3.12	3.35	95	94	14.73	13.19	2.787	2.36	1406	1250
	2	354	277	65.74	54.82	2.83	3.28	94	92	14.66	12.42	2.666	2.22	1382	1150
	3	263	214	49.29	42.49	2.40	3.16	93	94	14.43	10.73	2.593	2.15	1346	1010
	Mean	356	288	66.16	57.16	2.78	3.27	94	93	14.61	12.11	2.682	2.24	1378	1136
CD (P = 0.05)		024	011	1.25	2.14	0.098	0.09	1.154	NS	0.22	0.27	0.087	0.08	33	42

CR - Castle Rock; PbU - Punjab Upma

Table 2. Correlation matrix of different characters in tomato varieties

Character	Seed yield		Fruit weight		1000-seed weight		Germination		Seedling length		Seedling dry weight	
	CR	PbU	CR	PbU	CR	PbU	CR	PbU	CR	PbU	CR	PbU
Fruit weight	0.9937	0.8913										
1000-seed weight	0.7965	0.4637	0.8057	0.6540								
Germination	0.4268	0.2062	0.4427	0.2435	0.6252	0.2194						
Seedling length	0.5326	0.5891	0.5478	0.7915	0.6336	0.6702	0.4531	0.1748				
Seedling dry weight	0.7387	0.6593	0.7398	0.7656	0.7280	0.6700	0.5378	0.3132	0.4226	0.5959		
Vigour index	0.5544	0.5962	0.5723	0.7886	0.7356	0.6723	0.8821	0.4718	0.8192	0.9502	0.5697	0.6366

r at 5% = 0.2303

CR - Castle Rock; PbU - Punjab Upma

characters under study in both the varieties (Table 2) indicated that fruit size was found to be significantly and positively correlated with seed yield, 1000-seed weight, germination percentage, seedling dry weight, seedling length and vigour index in both the varieties. The positive genotypic correlations suggested that the direct improvement of fruit weight has been accompanied with the indirect increase of seed yield, 1000-seed weight, germination percentage seedling length, seedling dry weight and seedling vigour.

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