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## Pre-Sowing seed treatment with vam in French bean: response for vegetable production

**PG Devhade, AK Basu and Nation Chamling**

**Abstract**

The field experiment was conducted on pre-sowing seed treatment of seeds of eight French bean genotypes viz., Sonali, Selection 9, Deepali, Abhay, Victoria, Arka Suvidha, Arka Anoop and Falguni was done with VAM (*Vesicular-arbuscular mycorrhiza*) and crop was grown from both treated and untreated control seeds during winter season of 2012-13 and 2013-14 following Split-Plot Design with three replications. Significant variation among the genotypes was consistent for vegetable pod yield and its attributes viz., plant height, number of branches, number of pods per plant, pod length and breadth, single pod weight and vegetable pod yield per plant. Pre-sowing seed treatment with VAM also exerted significant influence for creating variation in all these parameters studied. Genotypes x treatment interactions were also significant for these characters excepting vegetable pod breadth in both the years as well as in pooled condition.

**Keywords:** French bean, Vegetable yield and VAM

**Introduction**

French bean (*Phaseolus vulgaris* L.) (2n=22), is also known as common bean, rajmash, kidney bean, dry bean, field bean, snap bean, navy bean, etc. It belongs to the family *Leguminosae* and it is native of South America. It is nutritious vegetable and can be grown under different cropping patterns of hills and plains in India. It is extensively grown in Himachal Pradesh, Punjab, Haryana, Uttaranchal, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and West Bengal.

AMF [*Arbuscular mycorrhizal fungi*] have been shown to differentially colonize plant roots, causing a variety of effects on plant growth, biomass allocation, and photosynthesis (Fidelibus *et al.*, 2000). Lukiwati and Simanungkalit (2002), Jalaluddin (2005), Avis *et al.* (2008) studied the effect of VAM (*Glomus mossae*) on growth and productivity of legumes, wherein significant influence VAM was observed, when compared with non-mycorrhizal plants. *Mycorrhizal* plants performed better than non-mycorrhizal plants. The VAM inoculated plants outperformed than noninoculated plants in terms of growth and productivity Parameters as well as in nutrient uptake (Tabassum *et al.*, 2012). The present study was undertaken to investigate response of VAM on vegetable yield and its attributes.

**Materials and Methods**

The field experiment was conducted during the winter seasons of 2012-2013 and 2013-2014 following Split-Plot Design with three replications at District Seed Farm 'D' Block, Bidhan Chandra Krishi Viswavidyalaya, Kalyani, Nadia, West Bengal. It is situated between 23°N latitude, 89°E longitude and an altitude of 9.75 meters above the mean sea level. Nature of soil of experimental site is sandy loam, almost neutral (pH-6.4) with good drainage facility. Pre-sowing treatment of seeds of all the eight genotypes was done with VAM (*vesicular arbuscular mycorrhiza*) @ 2 kg ha<sup>-1</sup> for assessment of varying response of individual genotypes with regard to vegetable yield and its attributes. Seeds were mixed thoroughly with paste of inoculums made with water, shade dried properly and then sown in field. Sowing was done in four meter rows with five lines each for individual genotypes and treatment within a replication. Row to row and plant to plant spacing was maintained as 40 cm and 25 cm respectively. Recommended agronomic practices were followed including cultural operations, as and when required. Observations were recorded on plant height at first flowering, number of vegetable pods per plant, length and breadth of vegetable pod and vegetable pod yield per plant.

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## Result and Discussion

Significant variation among the genotypes studied was noticed for the all characters considered. Influence of pre-sowing seed inoculation with VAM was found to be significant irrespective of the years as well as in pooled condition; genotype x VAM interaction effects were also significant for the parameters studied.

Average plant height at first flowering was found to be maximum for Selection 9 in both the years as well as in

pooled condition followed by Deepali, Arka Anoop, Falguni and Abhay in first year, by Arka Suvidha, Deepali, Arka Anoop and Falguni in second year, though Arka Anoop and Falguni as well as Arka Suvidha and Deepali performed in statistically similar manner in both the years and only in second year respectively. It is to note that position of genotypes other than Selection 9 were changed over the years of experiment as well as with the progress in plant growth indicating the unique rate of growth in genotype

**Table 1:** Average plant height (cm) at first flowering as influenced by VAM

Genotypes	First Year			Second Year			Pooled		
	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean
V <sub>1</sub>	25.35	29.19	27.27	24.93	27.47	26.20	25.14	28.33	26.74
V <sub>2</sub>	36.08	37.88	36.98	31.71	34.29	33.00	33.90	36.09	34.99
V <sub>3</sub>	32.52	36.25	34.39	30.22	33.04	31.63	31.37	34.65	33.01
V <sub>4</sub>	27.51	31.17	29.34	27.07	29.49	28.28	27.29	30.33	28.81
V <sub>5</sub>	24.77	26.73	25.75	26.27	30.16	28.22	25.52	28.45	26.98
V <sub>6</sub>	28.00	29.50	28.75	31.79	33.52	32.65	29.89	31.51	30.70
V <sub>7</sub>	30.13	31.65	30.89	29.95	31.31	30.63	30.04	31.48	30.76
V <sub>8</sub>	29.22	31.50	30.36	28.07	31.19	29.63	28.65	31.34	29.99
Mean	29.20	31.73	30.47	28.75	31.31	30.03	28.97	31.52	30.25
	V	T	VXT	V	T	VXT	V	T	VXT
SEd (±)	0.284	0.212	0.601	0.502	0.166	0.470	0.316	0.154	0.435
CD at 5%	0.609	0.450	1.274	1.078	0.352	0.352	0.679	0.326	0.924
CD at 1%	0.846	0.620	1.756	1.496	0.485	0.485	0.942	0.450	1.273

V<sub>1</sub>- Sonali, V<sub>2</sub>- Selection 9, V<sub>3</sub>- Deepali, V<sub>4</sub>- Abhay, V<sub>5</sub>- Victoria, V<sub>6</sub>- Arka Suvidha, V<sub>7</sub>- Arka Anoop, V<sub>8</sub>- Falguni. T<sub>0</sub>- Control, T<sub>1</sub>-VAM.

Number of branches per plant at final vegetable pod harvest stage was as maximum as 11.30 and 12.17 in respective years for Falguni, when average was made over the treatments, followed by Abhay, Arka Anoop, and Arka Suvidha in both the years as well as in pooled condition indicating that these genotypes have the inherited potentiality in producing higher branches and thereby expression of its branching nature. On the other hand, Victoria and Selection 9 could be identified as the less branching types due to its potentiality of producing least number of branches over the years of experimentation. Average influence of VAM could be noticed as significant in

enhancing the number of branches over that of un-inoculated control in both the years and pooled condition. Similar trend could also be noted for performance of individual genotypes, excepting Victoria in first year, with varying rate of enhancement depending on the genetic make-up of individual genotypes (Table-2). Observation of Ramana *et al.* (2010) on significant enhancement in plant height and number of branches at harvest was recorded in French bean after inoculation with either VAM or PSB or its combination over control may corroborate the findings of the present investigation.

**Table 2:** Average number of branches at final vegetable pod harvest stage as influenced by VAM

Genotypes	First Year			Second Year			Pooled		
	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean
V <sub>1</sub>	6.93	8.40	7.67	7.00	8.53	7.77	6.97	8.47	7.72
V <sub>2</sub>	6.53	7.93	7.23	7.07	8.13	7.60	6.80	8.03	7.42
V <sub>3</sub>	7.13	8.07	7.60	7.40	8.27	7.83	7.27	8.17	7.72
V <sub>4</sub>	11.07	11.53	11.30	11.60	12.73	12.17	11.33	12.13	11.73
V <sub>5</sub>	7.13	7.53	7.33	7.20	7.73	7.47	7.17	7.63	7.40
V <sub>6</sub>	8.07	8.87	8.47	8.27	9.07	8.67	8.17	8.97	8.57
V <sub>7</sub>	9.80	10.67	10.23	9.87	10.87	10.37	9.83	10.77	10.30
V <sub>8</sub>	12.87	13.93	13.40	13.07	14.27	13.67	12.97	14.10	13.53
Mean	8.69	9.62	9.15	8.93	9.95	9.44	8.81	9.78	9.30
	V	T	VXT	V	T	VXT	V	T	VXT
SEd (±)	0.141	0.067	0.190	0.103	0.058	0.166	0.099	0.053	0.150
CD at 5%	0.304	0.142	0.402	0.221	0.124	0.335	0.213	0.112	0.318
CD at 1%	0.422	0.196	0.555	0.306	0.172	0.486	0.296	0.155	0.439

V<sub>1</sub>- Sonali, V<sub>2</sub>- Selection 9, V<sub>3</sub>- Deepali, V<sub>4</sub>- Abhay, V<sub>5</sub>- Victoria, V<sub>6</sub>- Arka Suvidha, V<sub>7</sub>- Arka Anoop, V<sub>8</sub>- Falguni. T<sub>0</sub>-Control, T<sub>1</sub>-VAM.

It could be revealed through Table-3 that Falguni possesses the potentiality of producing highest number of vegetable pods in comparison to other genotypes, which could be established through its performances over the years of experimentation as well as in pooled condition followed by Sonali, Abhay, Arka Anoop, Victoria and Arka Suvidha; while it was lowest for Selection 9 in all situations. Position

of Arka Anoop, Arka Suvidha and Victoria were changed over the years for expression of this character, may be due to higher sensitivity of these three genotypes towards changed climate over the years in comparison to that of other genotypes. Enhanced number of vegetable pods in second year may be due to the influence of favourable climatic condition prevailed during post-fertilization development in

second year. Average number of vegetable pods was enhanced significantly due to pre-sowing inoculation of seeds with VAM. The same trend could be noticed for individual genotypes over the years indicating the potentiality of this inoculation in enhancing this parameter irrespective of individuals having different genetic background, though the

rate of enhancement varied. Enhancement in number of vegetable pods may have been occurred due to synergistic effect of this inoculant through enhancing mobilization of phosphorus and other important nutrients from soil to the plant and thereby boosting the pod retention potentiality of the plants (Maya *et al.*, 2012).

**Table 3:** Average number of vegetable pods per plant as influenced by VAM

Genotypes	First Year			Second Year			Pooled		
	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean
V <sub>1</sub>	28.53	34.97	31.75	31.00	34.93	32.97	29.77	34.95	32.36
V <sub>2</sub>	17.31	23.27	20.29	19.53	23.00	21.27	18.42	23.13	20.78
V <sub>3</sub>	21.80	25.67	23.73	22.73	24.80	23.77	22.27	25.23	23.75
V <sub>4</sub>	26.13	30.73	28.43	28.40	32.30	30.35	27.27	31.52	29.39
V <sub>5</sub>	22.07	26.27	24.17	29.07	32.03	30.55	25.57	29.15	27.36
V <sub>6</sub>	23.33	26.47	24.90	24.40	26.63	25.52	23.87	26.55	25.21
V <sub>7</sub>	24.20	28.47	26.33	26.07	29.33	27.70	25.13	28.90	27.02
V <sub>8</sub>	33.13	36.40	34.77	39.57	43.00	41.28	36.35	39.70	38.03
Mean	24.56	29.03	26.80	27.60	30.75	29.18	26.08	29.89	27.99
	V	T	VXT	V	T	VXT	V	T	VXT
SEd (±)	0.369	0.252	0.715	0.254	0.144	0.409	0.233	0.166	0.470
CD at 5%	0.793	0.536	0.738	0.545	0.307	0.869	0.500	0.352	0.997
CD at 1%	1.100	0.738	1.516	0.756	0.423	1.197	0.695	0.486	1.374

V<sub>1</sub>- Sonali, V<sub>2</sub>- Selection 9, V<sub>3</sub>- Deepali, V<sub>4</sub>- Abhay, V<sub>5</sub>- Victoria, V<sub>6</sub>- Arka Suvidha, V<sub>7</sub>- Arka Anoop, V<sub>8</sub>- Falguni. T<sub>0</sub>-Control, T<sub>1</sub>-VAM.

Significantly longest pods were produced by Selection 9 in both the years as well as in pooled condition, followed by Deepali, Sonali Falguni and Arka Anoop in first year, and by Deepali, Falguni, Victoria and Sonali in second year, though Sonali and Falguni produced pods with statistically similar length, and similar situation was observed for Deepali and Falguni as well as for Victoria and Sonali in second year; slight change in position of those genotypes may be due to expression of irregular changed of agro-climatic condition during cropping season. Influence of VAM after pre-sowing seed inoculation on significant enhancement in pod length could be noticed over the years, when average was made over

the genotypes. Individual genotypes also responded in the similar manner for enhancement in average pod length due to application of VAM, excepting Victoria in first year. Reduced pod length recorded in second year for major genotypes may have been occurred due to its climatic preference during development of pod, reverse scenario could be noticed for Abhay, Victoria and Falguni, for which pod length was enhanced in second year (Table-4). Rate of enhancement due to application of VAM varied with the genotypes indicating its inherited potentiality to respond for expression of this character.

**Table 4:** Average vegetable pod length (cm) as influenced by VAM

Genotypes	First Year			Second Year			Pooled		
	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean
V <sub>1</sub>	13.97	14.41	14.19	13.59	13.93	13.76	13.78	14.17	13.98
V <sub>2</sub>	15.31	15.97	15.64	14.94	15.86	15.40	15.12	15.92	15.52
V <sub>3</sub>	14.26	14.85	14.56	14.09	14.75	14.42	14.17	14.80	14.49
V <sub>4</sub>	11.60	12.61	12.11	12.49	12.97	12.73	12.05	12.79	12.42
V <sub>5</sub>	13.53	13.75	13.64	13.80	14.11	13.95	13.66	13.93	13.80
V <sub>6</sub>	13.28	13.87	13.57	13.06	13.84	13.45	13.17	13.85	13.51
V <sub>7</sub>	13.47	13.86	13.67	13.07	13.55	13.31	13.27	13.71	13.49
V <sub>8</sub>	13.97	14.32	14.14	13.99	14.80	14.40	13.98	14.56	14.27
Mean	13.67	14.20	13.94	13.63	14.23	13.93	13.65	14.22	13.93
	V	T	VXT	V	T	VXT	V	T	VXT
SEd (±)	0.101	0.050	0.142	0.083	0.035	0.100	0.072	0.022	0.064
CD at 5%	0.217	0.106	0.302	0.178	0.075	0.213	0.154	0.048	0.137
CD at 1%	0.301	0.147	0.416	0.247	0.103	0.294	0.214	0.066	0.188

V<sub>1</sub>- Sonali, V<sub>2</sub>- Selection 9, V<sub>3</sub>- Deepali, V<sub>4</sub>- Abhay, V<sub>5</sub>- Victoria, V<sub>6</sub>- Arka Suvidha, V<sub>7</sub>- Arka Anoop, V<sub>8</sub>- Falguni. T<sub>0</sub>-Control, T<sub>1</sub>-VAM.

Average vegetable pod breadth could be recorded as maximum for Arka Suvidha in first year followed by Selection 9, Arka Anoop, Deepali and Abhay; it was Selection 9 in second year followed by Arka Suvidha, Arka Anoop, Abhay and Deepali, though performance of first two were non-significantly different with each other, at the same time the other three genotypes recorded pod breadth statistically at par with each other. While considering pooled analysis, significantly similar and highest pod was breadth

recorded for Arka Suvidha and Selection 9, as was recorded in second year, followed by Arka Anoop, Deepali and Abhay (Table-5). VAM was found to exert significant influence in enhancing vegetable pod breadth over un-inoculated control, when average was made over the genotypes. In spite of having non-significant influence of pre-sowing seed inoculation with VAM, higher magnitude of vegetable pod breadth could be noticed after inoculation for all the genotypes over control.

**Table 5:** Average vegetable pod breadth (cm) as influenced by VAM

Genotypes	First Year			Second Year			Pooled		
	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean
V <sub>1</sub>	0.81	0.87	0.84	0.82	0.88	0.85	0.82	0.88	0.85
V <sub>2</sub>	1.01	1.10	1.05	1.06	1.11	1.09	1.03	1.11	1.07
V <sub>3</sub>	0.93	0.99	0.96	0.91	0.96	0.94	0.92	0.98	0.95
V <sub>4</sub>	0.89	0.97	0.93	0.91	0.99	0.95	0.90	0.98	0.94
V <sub>5</sub>	0.87	0.93	0.90	0.88	0.94	0.91	0.87	0.93	0.90
V <sub>6</sub>	1.07	1.11	1.09	1.03	1.13	1.08	1.05	1.12	1.08
V <sub>7</sub>	0.95	1.04	1.00	0.93	1.00	0.96	0.94	1.02	0.98
V <sub>8</sub>	0.81	0.89	0.85	0.87	0.95	0.91	0.84	0.92	0.88
Mean	0.92	0.99	0.95	0.93	1.00	0.96	0.92	0.99	0.96
	V	T	VXT	V	T	VXT	V	T	VXT
SEd (±)	0.006	0.004	0.013	0.015	0.007	0.021	0.009	0.004	0.011
CD at 5%	0.014	0.009	NS	0.033	0.015	NS	0.021	0.008	NS
CD at 1%	0.020	0.013	NS	0.033	0.020	NS	0.029	0.012	NS

V<sub>1</sub>- Sonali, V<sub>2</sub>- Selection 9, V<sub>3</sub>- Deepali, V<sub>4</sub>- Abhay, V<sub>5</sub>- Victoria, V<sub>6</sub>- Arka Suvidha, V<sub>7</sub>- Arka Anoop, V<sub>8</sub>- Falguni. T<sub>0</sub>-Control, T<sub>1</sub>-VAM.

Selection 9 could be identified as the genotype which exhibited maximum average weight of single vegetable pod consistently over the years as well as in pooled condition followed by that of Arka Suvidha, Arka Anoop, Deepali and Abhay in first year, and by Arka Suvidha, Arka Anoop, and Abhay in second year and pooled condition, though performance of Arka Suvidha, Arka Anoop and Deepali was statistically at par with each other in first year, and that of Arka Suvidha and Deepali was similar with each other in second year and pooled condition. Slight variation in

performance of the genotypes for single pod weight over the years may be due to influence of changed environmental conditions and / or variation in agro-techniques followed over the years. Similar to other parameters, VAM exerted significant influence on enhancement of this parameter when average was made over the genotypes. The same trend could also be noticed for all the genotypes over the years without any exception. Variation in response among the genotypes towards VAM inoculation may be evidenced through Table-8 on change (%) after seed inoculation with VAM.

**Table 6:** Average single vegetable pod weight (g) as influenced by VAM

t	First Year			Second Year			Pooled		
	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean
V <sub>1</sub>	5.245	5.900	5.573	5.181	5.776	5.478	5.213	5.838	5.525
V <sub>2</sub>	7.423	7.904	7.663	7.480	8.058	7.769	7.452	7.981	7.716
V <sub>3</sub>	6.732	7.376	7.054	6.800	7.716	7.258	6.766	7.546	7.156
V <sub>4</sub>	5.618	6.553	6.086	5.844	6.913	6.379	5.731	6.733	6.232
V <sub>5</sub>	5.108	5.648	5.378	5.160	5.676	5.418	5.134	5.662	5.398
V <sub>6</sub>	6.589	7.859	7.224	6.872	7.989	7.430	6.730	7.924	7.327
V <sub>7</sub>	6.644	7.753	7.198	6.199	7.308	6.754	6.421	7.531	6.976
V <sub>8</sub>	5.283	6.016	5.650	5.394	6.218	5.806	5.339	6.117	5.728
Mean	6.080	6.876	6.478	6.116	6.957	6.537	6.098	6.916	6.507
	V	T	VXT	V	T	VXT	V	T	VXT
SEd (±)	0.106	0.057	0.161	0.140	0.052	0.149	0.091	0.043	0.123
CD at 5%	0.228	0.121	0.342	0.301	0.112	0.317	0.196	0.092	0.262
CD at 1%	0.317	0.166	0.471	0.418	0.154	0.436	0.273	0.127	0.361

V<sub>1</sub>- Sonali, V<sub>2</sub>- Selection 9, V<sub>3</sub>- Deepali, V<sub>4</sub>- Abhay, V<sub>5</sub>- Victoria, V<sub>6</sub>- Arka Suvidha, V<sub>7</sub>- Arka Anoop, V<sub>8</sub>- Falguni. T<sub>0</sub>-Control, T<sub>1</sub>-VAM.

Average vegetable yield per plant was recorded as maximum (194.32 g) for Arka Anoop in first year, while it was 262.32 g and 218.06 g for Falguni in second year and pooled condition respectively. Arka Anoop was followed by Abhay, Falguni, Arka Suvidha, Sonali and Deepali in first year, though Abhay and Falguni as well as Sonali and Deepali performed significantly in similar manner, while Falguni was followed by Abhay, Arka Anoop, Arka Suvidha Sonali and Deepali in second year with non-significant difference between Abhay and Arka Anoop, between Arka Anoop and Arka Suvidha as well as between Sonali and Deepali. Shuffling among some genotypes with regard to its position or rank for this parameter may be due to variation in its component attributes

and/or due to changed climatic factors prevailed during the years of experimentation. When average was made over the genotypes, significant influence of VAM could be noticed on enhancement of vegetable yield per plant in both the years and pooled condition. Varying response of individual genotypes towards VAM could be recognised through Table-8, where different rates of enhancement could be noticed for individual genotypes. Superior influence of VAM along with *Rhizobium* on enhancement of pod length and yield of French bean over un-inoculated control was observed by Bhardwaj *et al.* (2010) and Ramana *et al.* (2010), which support the findings of the present investigation.

**Table 7:** Average vegetable yield per plant (g) as influenced by VAM

Genotypes	First Year			Second Year			Pooled		
	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean	T <sub>0</sub>	T <sub>1</sub>	Mean
V <sub>1</sub>	143.74	180.03	161.89	150.31	181.59	165.95	147.03	180.81	163.92
V <sub>2</sub>	106.33	185.34	145.84	153.09	174.52	163.81	129.71	179.93	154.82
V <sub>3</sub>	144.65	177.92	161.29	133.98	174.94	154.46	139.31	176.43	157.87
V <sub>4</sub>	161.47	202.60	182.03	171.29	228.87	200.08	166.38	215.73	191.06
V <sub>5</sub>	106.31	137.70	122.00	147.76	168.43	158.10	127.03	153.07	140.05
V <sub>6</sub>	142.77	187.33	165.05	168.65	192.80	180.72	155.71	190.06	172.89
V <sub>7</sub>	172.44	216.21	194.32	172.15	209.67	190.91	172.30	212.94	192.62
V <sub>8</sub>	158.11	190.70	174.40	235.85	288.78	262.32	196.98	239.74	218.36
Mean	141.98	184.73	163.35	166.64	202.45	184.54	154.31	193.59	173.95
	V	T	VXT	V	T	VXT	V	T	VXT
SEd (±)	6.185	2.376	6.720	6.982	2.827	7.998	4.702	1.719	4.863
CD at 5%	13.265	5.037	14.246	14.976	5.994	16.955	10.086	3.644	10.309
CD at 1%	18.412	6.939	19.629	20.786	8.259	23.361	13.999	5.022	14.204

V<sub>1</sub>- Sonali, V<sub>2</sub>- Selection 9, V<sub>3</sub>- Deepali, V<sub>4</sub>- Abhay, V<sub>5</sub>- Victoria, V<sub>6</sub>- Arka Suvidha, V<sub>7</sub>- Arka Anoop, V<sub>8</sub>- Falguni. T<sub>0</sub>-Control, T<sub>1</sub>-VAM.

**Table 8:** Change (%) after VAM treatment for vegetable yield and some important attributes

Genotypes	Number of pods per plant			Pod weight			Yield per plant		
	First Year	Second Year	Pooled	First Year	Second Year	Pooled	First Year	Second Year	Pooled
V <sub>1</sub>	22.55	12.69	17.41	12.50	11.48	12.00	25.25	20.81	22.98
V <sub>2</sub>	34.39	17.75	25.57	6.48	7.73	7.10	74.32	14.00	38.72
V <sub>3</sub>	17.74	9.09	13.32	9.56	13.46	11.52	23.00	30.57	26.64
V <sub>4</sub>	17.60	13.73	15.59	16.64	18.29	17.48	25.47	33.62	29.66
V <sub>5</sub>	19.03	10.21	14.02	10.55	10.00	10.28	29.53	13.99	20.49
V <sub>6</sub>	13.43	9.15	11.24	19.27	16.25	17.73	31.21	14.32	22.06
V <sub>7</sub>	17.63	12.53	14.99	16.69	17.89	17.27	25.38	21.79	23.59
V <sub>8</sub>	9.86	8.68	9.22	13.87	15.28	14.58	20.61	22.44	21.71

V<sub>1</sub>- Sonali, V<sub>2</sub>- Selection 9, V<sub>3</sub>- Deepali, V<sub>4</sub>- Abhay, V<sub>5</sub>- Victoria, V<sub>6</sub>- Arka Suvidha, V<sub>7</sub>- Arka Anoop, V<sub>8</sub>- Falguni.

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