



## EVALUATION TRIAL IN YARD LONG BEAN (*VIGNA UNGUICULATA* SSP. *SESQUIPEDALIS* (L.) VERDIC.) IN ALLAHABAD AGRO-CLIMATIC CONDITION

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### ABSTRACT

The experiment was conducted during *kharif* season 2017 on crop research farm of Department Of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology & Sciences, Randomized Block Design with three replications, twelve yard long bean genotypes were evaluated for growth and yield Under Allahabad Agro-Climatic Condition. The study revealed that the highest plant height was recorded by the genotype COPBVAR-3 (189.67 cm). While the genotype COPBVAR-3 (10.33) recorded the highest number of branches per plant. The genotype COPBVAR-3 (4.67) recorded the highest flower per cluster. Earliness for first flowering was recorded in COPBVAR-5 (32.33 days after sowing), 50% flowering was recorded in copbvar-3 (47.67 days after sowing) and earliness in first pod picking was recorded in three genotypes IMPROVED AK-57, TS-18 LONG YARD, RICHA (65.33 days after sowing). Maximum Pod length was recorded in COPBVAR-6 (51.67 cm), number of seeds per pod was recorded in RICHA (18.67), pod yield per plant (481.33 g) and per hectare (264.67Q/ha). All the yard long bean genotypes were found acceptable. The genotype LOLA-C was found superior based on the overall performance of different yard long bean genotypes for growth, flowering behaviour, yield and sensory evaluation for cultivation under agroclimatic conditions of Allahabad.

**KEY WORDS:** Yard long bean, evaluation, agroclimatic, pod picking.

### INTRODUCTION

Yard long bean (*Vigna unguiculata* ssp. *sesquipedalis* (L.) Verdic.) is known as vegetable cowpea, asparagus bean, string bean, snake bean, snake pea, snap pea, bodi, bora and sitao. Its origin is probably in the Middle West Africa or in Southern China. Yard long bean is widely grown in Southeast Asia, South China and West Africa for immature pods which are used as a vegetable. Yard long bean is one of the economically important vegetable crops in India. Production area of yard long bean in India is about 18,560–20,160 ha annually. It is usually grown intercropped with sorghum or millet and also in rotation cropping system. This plant is of a different genus from the common bean. It is a vigorous climbing annual vine. A variety of the cowpea, it is grown primarily for its strikingly long (35- to 75-cm) immature pods and has uses very similar to that of the green bean. The many varieties of yard long beans are usually distinguished by the different colors of their mature seeds. The plant attracts many pollinators, specifically various types of yellow jackets and ants.

The pods, which can begin to form just 60 days after sowing, hang in groups of two or more. They are best for vegetable use if picked before they reach full maturity; however, overlooked pods can be used like dry beans in soups. When harvesting, it is important not to pick the buds which are above the beans, since the plant will set many more beans on the same stem. The plants take longer to reach maturity than bush beans, but once producing, the beans are quick-growing and daily checking/harvesting is often essential. The plants produce beans until frost. It is a

highly self-pollinating annual crop with a climbing vine. Natural crossing between plants in a row is less than 1%. Yard long bean is broadly grown in Southeast Asia, South China, Central and West Africa for the immature pods which are used as vegetables. Pod quality is judged on the basis of pod colour and length; desirable qualities differ in different markets. For instance Thailand and Hong Kong prefer light green and extra long pods; Brunei prefers dark green, short pods, while European and Canadian markets prefer dark green, and medium pod length. It exhibits vigorous growth in warm climate. Optimum average temperature during the growing period is 20°C to 30°C. It prefers full sunshine during growth and development, whereas cloudy and rainy weather cause low yield due to flowers and young pods dropping. It can be grown in various soil types from sandy loam to clay, but loam and sandy loam with pH 6.2-7.0 are the best for yard long bean production.

Yard long bean are day-neutral and tolerate heat and comparatively dry conditions better than the pole bean. However, it does require a higher rainfall than the more drought-tolerant black-eyed pea. Yard long beans do not have a long shelf life. Decreased postharvest acceptability is the result of high respiration and wilting of the pods. Although low-temperatures storage will prolong shelf life, the pods are chilling-sensitive and are injured even after a few days at temperatures below 10°C. Darkening, rusty brown lesions, seed discoloration, and increased susceptibility to decay can occur if pods are stored between 5 and 7.5°C (Cantwell and Kasmire, 2002). Yard long beans are a significant source of nutrition. The U.S.

Department of Agriculture (2005) reported that yard long beans are a good source of vitamins A and C, providing 17% and 31% of the recommended daily allowance for these vitamins, respectively.

It is a highly nutritive vegetable containing high percentage of digestible protein (23.52-26.27%) (Ano and Ubochi, 2008), calcium (72.0 mg), phosphorus (59 mg), iron (2.5 mg), carotene (564 mg), thiamine (0.07 mg), riboflavin (0.09 mg) and vitamin C (24 mg) per 100 g of edible pods. It is also a good source of micronutrients containing 102.69-120.02 mg kg<sup>-1</sup> of iron, 32.58-36.66 mg kg<sup>-1</sup> of zinc, 2.92-3.34 mg kg<sup>-1</sup> of manganese, and 0.33-0.57 mg kg<sup>-1</sup> of cobalt (Ano and Ubochi, 2008).

### MATERIALS & METHODS

The experiment was conducted at the vegetable research farm department of horticulture, Sam Higginbottom University of Agriculture, Technology and Sciences during Kharif season, 2018-19. The material for the study comprised of 14 cowpea cultivars, of which 6 were collected from IIVR, Varanasi and 6 were collected locally. The cultivars were raised in field experiment in randomized block design with three replications. Growth and yield parameter data were collected at appropriate times throughout the experimental period from five randomly selected plants from each plot. Following observation recorded Growth parameters Plant height (cm), Number of branches, Number of flowers per cluster, Days to taken 1<sup>st</sup> flowering, Days to 50 % flowering, Days to 1<sup>st</sup> pod picking, Pod length (cm), Yield parameters, Number of seeds per pod, Pod yield per plant (kg), Total pod yield (q/ha). The significance and non-significance of the treatment effect were judged with the help of 'F' variance ratio test. Calculated 'F' value (variance ratio) was compared with the table value of 'F' at 5% level of

significance. If calculated value exceeded the table value, the effect was considered to be significant.

### RESULTS & DISCUSSION

The present investigation was carried out entitled "Evaluation trial in Yard long bean (*Vigna unguiculata* ssp. *sesquipedalis* (L.) Verdic.) in Allahabad agro-climatic condition" The mean replicated data collected on twelve genotypes of Yard long bean were subjected to the appropriate statistical analysis for drawing valid conclusions. Table-1 Maximum plant height was recorded in COPBVAR-3 (189.67 cm) followed by COPBVAR-4 (167.33 cm), COPBVAR-5 (165.67 cm), check variety LOLA C (131.33 cm) and minimum for LOBIA YB-9 (104.33 cm). The highest number of branches was recorded in the genotype COPBVAR-3 (10.33), which was more with the genotypes IMPROVED AK-57 (8.67), COPBVAR-5 (8.33), NS-634 (8.33), COPBVAR-1 (7.67) and COPBVAR-6 (7.67), the lowest number of primary branches reported in genotype LOLA-C (5.67). The highest number of flower per cluster was recorded in genotype COPBVAR-3 (4.67) was followed by COPBVAR-5 (4.33) and COPBVAR-1 (3.67). The lowest number of flower per cluster was noticed in IMPROVED AK-57 and LOLA-C (2.67). The genotype COPBVAR-5 (32.33 days) showed earliest flowering followed by COPBVAR-6 (34.33 days), ANDE (35.33 days) COPBVAR-4 (37.67 days) and COPBVAR-1 (37.67 days). Maximum days taken to first flowering was recorded in RICHA (41.67 days). The lowest days for fifty per cent flowering were recorded in the genotype COPBVAR-3 (47.67 days), followed by genotype COPBVAR-4 (48.33 days) and was significantly superior over rest of the treatments. Maximum days taken to fifty per cent flowering were recorded by the genotypes RICHA (53.67 days).

**TABLE 1:** Evaluation of yard long bean genotypes for growth and flowering parameters

S.No.	Name of Genotypes	Plant height (cm)	Number of branches	Number of flower per cluster	Days to taken first flowering	Days To 50% Flowering
1	COPBVAR-1	155.33	7.67	3.67	38.67	52.33
2	COPBVAR-3	189.67	10.33	4.67	37.67	47.67
3	COPBVAR-4	167.33	7.33	3.67	37.67	48.33
4	COPBVAR-5	165.67	8.33	4.33	32.33	51.33
5	COPBVAR-6	120.33	7.67	3.67	34.33	51.33
6	LOLA-C	131.33	5.67	2.67	40.67	52.67
7	IMPROVED AK-57	139.67	8.67	2.67	38.33	50.67
8	TS-18 LONG YARD	116.33	7.33	3.33	40.67	51.67
9	NS-634	124.67	8.33	3.33	40.67	52.33
10	RICHA	117.33	7.33	3.67	41.67	53.67
11	ANDE	126.33	7.33	3.67	35.33	49.67
12	LOBIA YB-9	104.33	7.33	3.33	39.33	50.67
13	Mean	138.19	7.78	3.56	38.11	51.03
14	Results	S	S	S	S	S
15	SE.d	1.15	0.74	S	1.43	1.95
16	C.D (5%)	2.39	1.53	0.97	2.97	4.05

**Table-2** The highest pod length was recorded in genotype COPBVAR-6 (51.67 cm), followed by genotype NS-634 (49.67 cm) and significantly superior over genotypes COPBVAR-5 (45.33 cm), COPBVAR-1 (42.67 cm), RICHA (42.67 cm), LOBIA YB-9 (42.33), LOLA-C (40.67 cm), and ANDE (40.67 cm). The lowest pod length

was recorded (30.33 cm) by TS-18 YARD LONG. The highest number of seeds per pod was noticed in genotype RICHA (18.67), followed by COPBVAR-1 (17.67) and was superior over rest of the genotypes. The genotype COPBVAR-3 (13.33) showed the lowest seeds per pod. The variation in yield attributing character viz., days to 1<sup>st</sup>

pod picking, pod yield per plant (g), pod yield per plot (kg) and per hectare (q) varied significantly in all cowpea genotypes under study. The lowest days required to first harvest were noticed in the genotype COPBVAR-4 (51.67 days) where as The three genotypes IMPROVED AK-57, TS-18 YARD LONG, RICHA (65.33 days) recorded the highest days to first harvest. The highest pod yield per plant was recorded in genotype LOLA-C (481.33 g), followed by genotypes COPBVAR-1 (390.67g),

COPBVAR- 5 (311.67 g), IMPROVED AK-57 (304.67 g), RICHA (262.67g), LOBIA YB-9 (242.67g). The genotype NS-634 (117.33 g) noticed the lowest pod yield per plant. The highest pod yield per hectare was recorded in genotype LOLA-C (264.67 q/ha), followed by genotypes COPBVAR-1 (208.33 q/ha), COPBVAR-5 (170.67 q/ha), IMPROVED AK-57 (167.67 q/ha). The genotype NS-634 (95.67 q/ha) noticed the lowest pod yield per hectare.

**TABLE 2:** Evaluation of yard long bean genotypes for yield and yield attributing characters

S.NO.	Name of Genotypes	Days To First Pod Picking	Pod Length	Number of Seed Per Pod	Pod Yield Per Plant	Total Pod Yield
1	COPBVAR-1	54.67	42.67	17.67	390.67	208.33
2	COPBVAR-3	54.33	36.67	13.33	239.33	130.33
3	COPBVAR-4	51.67	33.33	14.67	222.67	124.67
4	COPBVAR-5	53.33	45.33	14.67	311.67	170.67
5	COPBVAR-6	58.33	51.67	14.33	234.33	128.33
6	LOLA-C	61.33	40.67	16.67	481.33	264.67
7	IMPROVED AK-57	65.33	33.33	15.67	304.67	167.67
8	TS-18 LONG YARD	65.33	30.33	13.67	211.33	112.67
9	NS-634	63.33	49.67	14.67	174.33	95.67
10	RICHA	65.33	42.67	18.67	262.67	156.33
11	ANDE	61.67	40.67	14.67	210.67	113.67
12	LOBIA YB-9	62.33	42.33	16.67	242.67	128.33
13	Mean	59.75	40.78	15.45	273.86	150.11
14	Results	S	S	S	S	S
15	SE.d	1.38	1.40	0.62	14.20	1.38
16	C.D (5%)	2.85	2.89	1.28	29.45	2.85

## CONCLUSION

It was concluded that, all the characters *viz.*, growth parameters, yield, parameters were varied significantly. Based on the present investigation it is concluded that the genotype COPBVAR – 3 were found to be best in terms of maximum plant height, Number of Branches, Number of Flower per cluster, Days to 50% flowering and Days to first pod picking, maximum number of seeds/pod was recorded in genotype Richa whereas the maximum pod yield/plant, Pod Yield/ha was recorded in genotype Lola C. and minimum was recorded in genotypes NS-634.

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