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Evaluation of High Yielding Yard Long Bean Varieties

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ABSTRACT

Field experiments were conducted for two crop seasons during 2019-20 to assess the performance of high yielding yard long bean varieties (Manjari and Githika) in KVK cluster areas of Kottayam district. The trials were conducted at 10 farmers' plots each during two crop seasons and compared with cultivated variety (Vellayani Jyothika). Observations on pod length (cm), number of seeds per pod, number of pods/ kg and average pod yield (q/ha) were recorded in addition to sensory evaluation. The results indicated the superiority of variety Githika in terms of pod length (51.0 cm), number of seeds per pod (20.2) with least number of pods per kg (42) and average yield (259 q/ha). The acceptance of varieties evaluated through sensorial characteristics using a 9 point hedonic scale revealed significantly greater acceptance of variety Githika over other two varieties in terms of colour (7.70), appearance (7.20), aroma (6.70), tenderness (8.70) and overall acceptability (7.20). On the basis of superior performance on yield and sensory evaluation, it could be concluded that variety Githika is suitable for large scale cultivation in Kottayam district.

Key Words: Yard Long Bean, Vellayani Jyothika, Manjari, Githika, Organoleptic analysis,Yield.

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INTRODUCTION

Vegetables play an inevitable role in providing essential nutrients and minerals vital for enhancing our health (Sajeena *et al*, 2015). In Kerala, vegetables are cultivated in an area of 41053 ha where as in Kottayam it is 2401 ha (FIB, 2022). Yard long bean (*Vigna unguiculata* ssp. *sesquipedalis* (L.) Verdc) an important and widely grown vegetable crop of Kerala. It is native to east and south east Asia and commonly adapted to the tropical and subtropical regions, characterized by its climbing growth habit and long pods. It is a highly nutritive legume vegetable which is also known as poor man's meat as it is an abundant and inexpensive source of digestible protein content of 23.5-26.3% (Ano and Ubochi, 2008). Yard long bean is an essential component of sustainable agriculture in marginal lands of tropics because of its quick growing nature. The productivity and quality of the produce is comparatively less during the monsoon periods due to heavy rain fall and incidence of pest and diseases (Litty Varghese and Celine, 2015). The fluctuating and uneconomic price further make the farming activities non profitable. With this background in consideration, an effort was made to find out high yielding varieties of yard long bean suitable to the agro-ecological situation of the district which could enhance the productivity and make the farming profitable.

MATERIALS AND METHODS

Two high yielding varieties of yard long bean released from Kerala Agricultural University were introduced and compared the performance with the farmer practice (Vellayani Jyothika) released from the same institute. All these varieties were found to perform well in different vegetable growing areas of the state. Githika is a high yielding mosaic resistant variety released during the year 2015. It has long thick fleshy pods with light green colour and the

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Table 1. Yield and yield attributes of yard long bean varieties in Kottayam district

Variety	Pod length (cm)	No. of seeds/pod	No. of pods/kg	Average yield (q/ha)
Vellayani Jyothika	45.0	19.1	55.0	215.0
Manjari	44.0	15.8	60.0	199.0
Githika	51.0	20.2	42.0	259.0
CD (0.05)	4.6	2.4	1.3	13.3

seeds are reddish brown. Manjari is a shade tolerant trailing variety released in 2018 which is ideal for intercropping and tolerant to mosaic. It produces light green long pods with red seeds.

Field experiments were conducted for two crop seasons during 2019-20 by involving 10 farmers from the cluster areas like TV Puram, Kooroppada, Kummanam, Thrickodithanam and Kumarakom. These areas come under agro ecological unit 4 (Kuttanad) and agro ecological unit 9 (South Central Laterites). Parts of AEU 4 are below, at or just above sea level and the climate is tropical humid monsoon type with mean annual temperature of 27.6°C and rainfall of 2746.1 mm whereas in AEU 9, the climate is tropical humid monsoon type with mean annual temperature of 26.5°C and rainfall of 2827 mm. The trials were laid out in RBD with 10 replication for two seasons. Each variety was grown in raised beds of 70 cm width and convenient length. Seeds treated with pseudomonas were planted at a spacing of 150 cm x 45 cm. Uniform cultivation practices were adopted as per KAU POP. Observations were recorded from five randomly selected plants from each plot. Pod length (cm), number of seeds per pod, number of pods per kg and average yield were recorded. Mean values were used for statistical analysis using the WASP 1 tool available in the website of ICAR – CCARI, Goa (https://ccari.res.in/waspnew.html).

Sensory evaluation of cooked yard long bean

Sensory evaluation of cooked yard long bean was conducted using a 9 point hedonic scale among 10 panellists to compare the organoleptic qualities and consumer acceptability of the varieties. Yard long beans sauted with coconut oil which is the most common and traditional recipe using yard long bean in Kerala, were prepared using three varieties and presented to the panellists. The panellists were selected from staffs of the Krishi Vigyan Kendra, Kottayam who are familiar with the quality attributes of yard long bean. They were instructed to rate the samples in terms of colour, appearance, taste, aroma, tenderness and overall acceptability in the prescribed score card where 9 indicated "like extremely" and 1 indicated "dislike extremely". The data were subjected to analysis of variance (ANOVA) using Statistical Package for Social Science (SPSS), version 16.0 for Windows.

RESULTS AND DISCUSSION

The results indicated that the variety Githika performs significantly better (Table 1) with regard to yield parameters when compare with the other two varieties. Pod length was higher in Githika (51 cm) followed by Vellayani Jyothika (45 cm) and Manjari (44 cm). The pods of Githika had the highest number of seeds per pod (20.2), whereas in Manjari, it was 15.8. The pod length and number of seeds per pod are correlated with yield and both can be considered as yield attributing parameters. These results were in agreement with Pandey *et al*., 2020. In their findings, number of pods had highest direct effect on pod yield.

The number of pods per kilogram is an essential trait, especially with farmer's point of view. The data pertaining to this parameter revealed that variety Githika has least number of pods per kilogram (42) where as in Vellayani Jyothika, it was 55 and in Manjari it was 60. Yield is the most important character to be considered for varietal selection for a particular location. Significant variation

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Table 2. Economic analysis of the cultivation of high yielding yard long bean varieties in Kottayam district (Rs/ha)

Variety	Gross cost	Gross income	Net income	BCR
Vellayani Jyothika	3.54	8.60	5.06	2.43
Manjari	3.54	7.96	4.42	2.25
Githika	3.54	10.36	6.82	2.93

among the varieties for yield was observed in the present study. Among the varieties studied, Githika recorded significantly maximum yield (259 q/ha) followed by Vellayani Jyothika (215 q/ha) and Manjari (199 q/ha). This may be due to highest pod length and more number of seeds per pod. Similar results of variation in yield was earlier reported by Litty Varghese and Celine (2015) and Sarada and Hari Prasad Rao (2020).

The assessment of economics of cultivation (Table 2) clearly indicated the superiority of variety Githika over the other two varieties as both net returns as well as the BCR were higher in Githika. The total cost of cultivation was similar for all three varieties (Rs. in lakhs 3.54/ha). Among the varieties Githika registered highest net income (Rs. in lakhs 6.82/ha) and benefit-cost ratio (2.93) followed by Vellayani Jyothika (Rs. in lakhs 5.06/ha, BCR 2.43) and Manjari (Rs. in lakhs 4.42/ha, BCR 2.25).

When the quality of food product is assessed by means of human sensory organs, the evaluation is said to be sensory or organoleptic. Sensory quality is a combination of different senses of perception coming into play in choosing and eating a food. Appearance, flavor and mouth feel decide the acceptance of the food (Srilakshmi, 2015).

There was a significant difference between yard long bean varieties in terms of colour, appearance, taste, aroma, tenderness and overall acceptability (Table 3). The p value of all the parameters tested were less than 0.05, the null hypothesis is rejected. Panellist rating for variety Manjari in terms of taste (7.90) was higher than those obtained for Githika although the latter was more generally accepted. Githika gave a significantly better preparation in terms of colour (7.70), appearance (7.20), aroma (6.70), tenderness (8.70) and overall acceptability (7.20). The variety Vellayani Jyothika was the least accepted variety according to panellist rating in all aspects.

CONCLUSION

It could be concluded that the variety Githika was found to be promising and suitable for Kottayam district. Farmer training programmes, demonstrations and extension activities with making the seed available to the farmers could enhance the adoption and cultivation of this high yielding yard long bean variety in the district.

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Table 3. Sensory scores of yard long bean varieties

Variety	Colour	Appearance	Taste	Aroma	Tenderness	Overall acceptability
Vellayani Jyothika	5.80	6.20	7.10	6.10	7.90	6.20
Manjari	7.50	7.00	7.90	6.40	8.40	7.00
Githika	7.70	7.20	7.30	6.70	8.70	7.20
P value	0.000	0.002	0.000	0.021	0.002	0.002

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