



Research Article

EVALUATION OF VEGETATIVE GROWTH AND YIELD PERFORMANCE OF RIDGE GOURD HYBRIDS ENTRIES [*Luffa acutangula* L. Roxb.]- ALL INDIA CO-ORDINATED VEGETABLE IMPROVEMENT PROJECT (AICVIP) HYBRID TRIALS (IET)

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Abstract- A field experiment was carried out to study on Evaluation of vegetative growth and yields performance of Ridge Gourd hybrids entries - All India Co-ordinated Vegetable Improvement Project (AICVIP) hybrid trials (IET) from 2013 to 2014 at the Department of Vegetable Crops, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore. The experiment was laid out in Randomized Block Design (RBD) with three replications, which included the seeds of the Ridge gourd hybrid entries viz. 2013/RIGHYB-1, 2013/RIGHYB-2, 2013/RIGHYB-5, 2013/RIGHYB-6, PUSA NASDAR (C) were sown with care in the field during the year 2013 to 2014 at the spacing of 150 X 75 cm with the plot size of 4.2 x 3.5 m. Significant differences were observed among the genotypes for growth and yield parameters. Among the different ridge gourd genotypes tested, the highest fruit yield (245.1 q/ha) was recorded in 2013/RIGHYB-1 followed by 2013/RIGHYB-5 (220.0 q/ha). Whereas the check, PUSA NASDAR (C) recorded the yield of 217.8 q/ha respectively.

Keywords- ICAR-AICVIP-VC, Ridge gourd hybrids entries (IET), Vegetative growth, Yield

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Introduction

Cucurbits vegetable crops belonging to family cucurbitaceae, which primarily comprised species consumed as food worldwide. The family consists of about 118 genera and 825 species. India is world's largest producer of vegetables next to China with an annual production around 162.187 (Million tonnes) from 92.05 (Million hectare) of land [1]. This quantity is much less than our requirements and serves capita-1 intake on only 135 g against the recommended requirement of 285g capita-1 day-1 for balance diet. The vegetable requirement for the country has been estimated 225 million tonnes by 2020. To achieve this target and to provide balanced diet it is necessary to boost up the production of vegetables by increasing area, use of improved technology and by developing and using high yielding varieties and hybrid varieties. *Luffa* [*Luffa acutangula* L. (Roxb.)] is believed to have originated in India and commonly called as ridge gourd, having diploid chromosome number $2n = 2x = 26$. It is one of the most important cucurbits grown throughout the country and world. It belongs to the family cucurbitaceae which includes about 118 genera and 825 species a number of major and minor cucurbits are cultivated which share about 5.6 per cent of the total vegetable production. Nitrogen (N) fertilization favors the development of the aerial parts over roots and consequently the promotion of flowering and fruiting of many crops. Potassium (K) is the nutrient having the strongest influence on plant growth, yield and quality attributes that determine fruit marketability [2]. The role of potassium in plant metabolism, growth, and development and its significance in production of marketable fruit and on fruit firmness, quality and visual appearance are published and well known [3]. However, it is also noted that one of the problems facing rural farmers on the fertilizer usage is lack of information on what type of fertilizer and quantity that will suit their crops and soil types [4]. A crop response to fertilizer is higher in soil with low nutrient contents than soil with high nutrient reserve [5]. With this background the present study was undertaken Evaluation of vegetative

growth and yield performance of Ridge Gourd hybrids entries - All India Co-ordinated Vegetable Improvement Project (AICVIP) hybrid trials (IET) have been received from IIVR, Varanasi and these hybrid trials were conducted from 2013 to 2014 at the Department of Vegetable Crops, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore and Fertigation Schedule- Ribbed gourd (Hybrid) Recommended dose: 250:100:100 Kg/ha as per the TNAU recommendation has been followed this Trials.

Materials and Methods

The experimental material i.e. seed packets of all the Ridge gourd hybrids entries (IET) received from the Project Coordinator, AICRP (Vegetable Crops), IIVR, Varanasi, Uttar Pradesh (India), were sown during the year 2013 to 2014 at the Department of Vegetable Crops, Horticultural College and Research Institute, Coimbatore. The seeds of the Ridge gourd hybrid entries viz. 2013/RIGHYB-1, 2013/RIGHYB-2, 2013/RIGHYB-5, 2013/RIGHYB-6, PUSA NASDAR (C) were used as the planting material and the vines were grown in the main field in pits of 1 x 1' size, arranged at 150 X 75 cm spacing with the plot size of 4.2 x 3.5 m. The field was irrigated immediately after planting. The crop was raised as per the TNAU recommended packaging practices of Recommended dose: 250:100:100 Kg/ha. Apply 10 kg of FYM, 100 g of NPK 6:12:12 g mixture as basal dose/pit and N @ 10 g/pit at 30 days after sowing. Apply *Azospirillum* and *Phosphobacteria* @ 2 kg/ha and *Pseudomonas* 2.5 kg/ha along with FYM 50 kg and neem cake @ 100 kg before last ploughing. Application of potassium in the form of potassium sulphate will increase quality of fruits. Need based manual hand weeding was done and the plots were kept free of weeds. The crop was immediately irrigated after planting using 'Thala' method to avoid transplanting shock. Subsequent irrigations were given at 3-5 days interval depending upon the moisture condition

Tables-1 Performance of growth, yield and quality of ridge gourd hybrids (IET)

Name of the entry	Node number at which 1 st flower appears)	Days to 50% flowering	Skin colour (light green/green/dark green)	Fruit length (cm) (Average of 5 fruits)	Fruit girth circumference (cm) (Average of 5 fruits)	Number of fruits/plant (Average of 5 plants)	Average fruit weight(g) (Average of 5 fruits)
2013/RIGHYB-1	6.3	35	Green	49.2	16.2	4.9	600
2013/RIGHYB-2	7.6	36.3	Green	46.2	14.4	5.7	450
2013/RIGHYB-5	6.7	37.7	Green	31.2	13.8	10.4	250
2013/RIGHYB-6	6.3	35.3	Green	32.8	12.2	8	300
PUSA NASDAR (C)	6.3	37.3	Green	35.4	14.2	11.7	225
CD 5%	1.84	1.75	-	2.63	2.73	2.29	4.12
CV%	14.62	2.56	-	3.58	10.23	14.92	0.6

Tables-2 Performance of growth, yield and quality of Ridge gourd hybrids (IET)

Name of the entry	Days to first fruit harvesting	Number of ridges/fruit (Average of 5 fruits)	Yield/plot (kg)	Yield/ha (q)	Duration of crop (sowing to last harvest)
2013/RIGHYB-1	55.3	10	55.1	245.1	138.7
2013/RIGHYB-2	54	10	47.8	212.5	140.3
2013/RIGHYB-5	56.3	10	49.5	220	141
2013/RIGHYB-6	54.7	10	45.1	200.4	139.7
PUSA NASDAR (C)	57.7	10	49	217.8	140.3
CD 5%	2.62	NS	3.05	13.25	3.94
CV%	2.5	NS	3.29	3.21	1.5

of experimental plot to maintain uniform soil moisture throughout crop growth period. Staking of plants is done using available wild bushes individually to each plant to ensure individual plant data. Need based plant protection measures were taken up to keep the plot free from pest and diseases and raise a healthy crop. Observations on five plant characters viz. Node number at which 1st flower appears, Days to 50% flowering, Skin colour, Fruit length (cm) (Average of 5 fruits), Fruit girth circumference (cm) (Average of 5 fruits), Number of fruits/plant (Average of 5 plants), Average fruit weight(g) (Average of 5 fruits), Days to first fruit harvesting, Number of ridges/fruit (Average of 5 fruits), Yield/plot (kg),Yield/ha (q) and Duration of crop (sowing to last harvest) were recorded. For recording field observations on vegetative, yield and other yield attributing parameters, five randomly chosen plants were tagged from each genotype in each replication were used. Green fruit yield data were recorded picking wise and calculated on hectare basis. Analysis of variance in respect of the various characters was done. The results of the Ridge gourd hybrids entries (IET) were presented in the [Table-1], and [Table-2].

Results and Discussion

Perusal of the data [Table-1], and [Table-2] clearly indicated that the significant differences existed in all plant growth characters, flowering and fruiting. The results revealed that the different ridge gourd hybrids genotypes (IET), the highest fruit yield (245.1 q/ha) was recorded in 2013/RIGHYB-1 followed by 2013/RIGHYB-5(220.0 q/ha). Whereas the check, PUSA NASDAR (C) recorded the yield of 217.8 q/ha respectively. Days to 50% of flowering for Ridge gourds IET entries showed significant variations. Early 50% of flowering was found from 2013/RIGHYB-1 (35 days).Which was followed by 2013/RIGHYB-6 (35.3days). Days to first harvesting of Ridge gourds hybrid entries was found from 2013/RIGHYB-2 (54 days).Which was followed by 2013/RIGHYB-6 (54.7 days). Fruit length and girth showed significant variations among the hybrid entries. The maximum fruit length and girth was found from 2013/RIGHYB-1 (49.2cm), 2013/RIGHYB-1 (16.2 cm) respectively, while the minimum from 2013/RIGHYB-5 (31.2cm), 2013/RIGHYB-6 (12.2cm) respectively. Number of fruit per plant showed significant variations among the different hybrid entries. The maximum number of fruit per plant was found from PUSA NASDAR (C) (11.7 Nos), which was followed by 2013/RIGHYB-5 (10.4Nos). Average fruit weight varies among the cultivars. However, maximum average fruit weight was found from 2013/RIGHYB-1 (600 g), followed by 2013/RIGHYB-2 (450g). Duration of crops showed significant variations among the cultivars. The maximum duration of crops was found from 2013/RIGHYB-5(141 days), which was followed by 2013/RIGHYB-2 and 6 (140.3 days).while the minimum duration of crops was found from 2013/RIGHYB-1 (138.7 days). It is also found that application of potassium fertilizer at the 250 ppm level led to the highest marketable yield [6]. Application of NPK fertilizer to the soil was necessary due to its low fertility in order to increase the crop growth and productivity which was in agreement with the results obtained

in case of taro [7, 8]. Similar increase in kakrol vine length with increased nitrogen was observed in case of bitter gourd [9, 10&11].Similar findings were reported by [12] where higher number of fruits per vine was obtained from 240:160:75 kg NPK ha⁻¹. On the other hand the increase in number of fruits was also due to increase in number of nodes on account of increased number of primary and secondary branches either due to increased nitrogen or potash. It was also reported by [13] in cucumber the higher number of branches and nodes per plant could be also attributed to the higher fruit number.

Conclusion

From the above study, it could be concluded, among the Ridge gourds hybrids entries tested (IET), the highest fruit yield (245.1 q/ha) was recorded in 2013/RIGHYB-1 followed by 2013/RIGHYB-5(220.0 q/ha). Whereas the check, PUSA NASDAR (C) recorded the yield of 217.8 q/ha respectively.

Application of Research:

The seeds of the Ridge gourd hybrid entries viz. 2013/RIGHYB-1, 2013/RIGHYB-2, 2013/RIGHYB-5, 2013/RIGHYB-6, PUSA NASDAR (C) were chosen for this study. Among the different ridge gourd genotypes tested, the highest fruit yield (245.1 q/ha) was recorded in 2013/RIGHYB-1 followed by 2013/RIGHYB-5(220.0 q/ha). Whereas the check, PUSA NASDAR (C) recorded the yield of 217.8 q/ha respectively.

Research Category: Vegetable Crops Science

Abbreviations:

AICRP-VC - All India Coordinated Research Project on Vegetable Crops
IET- Initial Evaluated trial
RIGHYB – Ridge gourd hybrid
C- Check (Variety)
G – Grams
IIVR-Indian Institute of Vegetable Research
FYM – Far Yard Manure
Kg/Ha- Kilo Gram/ Hectare
NPK- Nitrogen, Phosphorus and Potassium

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Study area / Sample Collection: Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore, 641003, Tamil Nadu

Cultivar / Variety name: *Luffa acutangula* L. (Roxb.)

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

Ethical Committee Approval Number: Nil

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