Eco. Env. & Cons. 30 (July Suppl. Issue) : 2024; pp. (S121-S123)
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ISSN 0971–765X

DOI No.: http://doi.org/10.53550/EEC.2024.v30i04s.021

Evaluation of Summer Squash Genotypes (*Cucurbita pepo* L.) under Tropical Conditions

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(Received 16 October, 2023; Accepted 29 December, 2023)

ABSTRACT

The investigation was carried out in a farmer's field Sorakalnatham, Natrampalli taluk, Tirupattur district, Tamil Nadu during 2022. The experimental design used was randomized block layout with three replications and twenty genotypes. In results indicate the genotype were significantly differed in growth and yield attributes. According to the grand mean data, the CP 13 genotype of summer squash showed the best performance in the tropical condition. Significantly greater than the grand mean in the growth attributes *viz.,* plant height (66.54 cm), least value was recorded in days taken for fifty per cent female flowering (40.54 days). The yield attributes was maximum than grand mean in term of single fruit weight (1200.18 g), number of fruits plant^{-1} (4.75), fruit yield plant^{-1} (5.64 kg).

Key words: *Tropical, Genotype, Growth, Summer Squash, Yield.*

Introduction

Summer squash (*Cucurbita pepo* L.) is regarded as one of the most widely consumed vegetable crops in Uttar Pradesh, Punjab and Haryana in India (Dhaliwal, 2012). Due to its profitability of cultivation and application in human consumption, this crop has a significant socioeconomic impact (Wazir *et al*., 2019). Summer squash cultivated all over the world in the summer in tropical and subtropical climates. Zucchini, globe squash, pattypan and yellow crookneck squash are examples of these cultivars small-fruited, non-trailing, fast-growing varieties. The erect, spreading plants yield a wide range of fruit shapes and colors, from flattened through rectangular to elongate and crooked fruits, as well as white through cream to yellow, green and variegated (Hassan *et al*., 2016).

It is one of the most economically significant vegetable crops. Its cultivation is primarily restricted to the middle hills in Northern India, where the summers are moderate. Although the state of Tamil Nadu has a wide variety of agro climatic conditions, vegetable cultivation practices are typically restricted to specific regions and seasonal needs. In addition, there is a lack of knowledge about the crops and the use of poor quality planting materials even during cultivation, which contributes to the state's low productivity when compared to the national level (Ivandro *et al*., 2014). A number of improved cultivars have been recently developed in the country in this crop but no effort has been made so far to evaluate them for their suitability of growing and crop management practices. As most of the summer squash cultivars are suitable for tropical and subtropical conditions, a variety which tolerates this varied climate and grows up well to give maximum yield is the need of the hour. This study was conducted to evaluate the performance of summer squash genotype for growth and yield attributes.

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Materials and Methods

The investigation was carried out in a farmer's field Sorakalnatham, Natrampalli taluk, Tirupattur district, Tamil Nadu during 2022. The summer squash germplasm consisting of twenty genotypes which were collected from various locations are used in this experiment. The experiment was carried out by adopting a Randomized Block Design and replicated thrice. Pits of size 45 cm^3 was made at a spacing of 1 m ×1 m. Five seeds were sown in each pit maintaining a plant population of twelve plant. Recommended cultured practices were adopted in this study. Observations such as plant height, days taken for fifty per cent female flowering, single fruit weight, number of fruits $plant^{-1}$ and fruit yield $plant^{-1}$ were estimated as follows.

Results and Discussion

Mean performance of growth and yield attributes

The mean performance of genotypes (Table 1) of plant height exhibited a range from 26.04 cm to 96.53 cm. The tallest plant was recorded in CP2 (96.53 cm), followed by CP4 (92.61 cm), CP10 (88.50 cm) and CP9 (84.55 cm), whereas the shortest plant (26.04 cm) was recorded in CP20. Nine genotypes *viz.*, CP1, CP2, CP3, CP4, CP6, CP9, CP10, CP11 and CP13 were exceeded the grand mean (61.36). Among the longtype genotypes, maximum plant height was found in CP2. In the roundtype genotypes, the highest value was recorded in CP18 (49.30 cm).

In the long type genotype CP13 showed earlier fifty per cent female flowering initiation. The flower bud appeared earlier. The genotype CP13 started the fifty per cent flowering flower buds earliest in 40.54 days, followed by the genotypes CP3 (40.75 days), CP12 (40.90 days), and CP10 (42.49 days), while the genotype CP16 observed the more days taken for fifty per cent female flowering. The ranges of values between the genotypes was 40.54 to 47.32 days, with a mean value of 44.71. It was found that the four genotypes CP3, CP10, CP12 and CP13 had recorded statistically significant more value than the grand mean. The similar reports given by Darshani *et al*. (2021) in pumpkin.

Table 1. Mean performance of summer squash genotypes for various growth and yield attributes

Genotypes	Plant height (cm)	Days taken for fifty per cent female flowering	Single fruit weight(g)	Number of fruits $plant^{-1}$	Fruit yield $plant^{-1}$ (kg)
CP1	76.61	44.47	565.21	4.33	2.34
CP2	96.53	45.91	514.02	3.67	1.79
CP3	64.88	40.75	680.54	4.13	2.71
CP4	92.61	43.62	463.04	3.98	1.74
CP5	80.56	45.70	1121.62	2.39	2.80
CP6	68.79	44.79	911.41	3.11	2.83
CP7	60.99	45.52	790.92	3.89	3.08
CP8	57.08	45.03	620.89	4.22	2.72
CP9	84.55	44.92	730.92	4.12	3.09
CP10	88.50	42.49	851.61	3.40	2.92
CP11	72.71	43.80	984.16	3.01	2.96
CP12	53.19	40.90	1053.03	4.30	4.58
CP13	66.54	40.54	1200.18	4.75	5.64
CP14	41.55	46.32	412.38	4.01	1.67
CP15	45.42	46.61	319.90	3.09	1.05
CP16	29.91	47.32	245.72	3.35	0.91
CP17	37.66	45.99	361.69	3.48	1.29
CP18	49.30	46.80	280.31	2.76	0.87
CP19	33.78	45.95	197.82	2.94	0.68
CP20	26.04	46.94	218.69	2.58	0.62
Grand mean	61.36	44.71	626.20	3.57	2.30
S.Ed	1.79	0.78	22.70	0.08	0.12
CD(P=0.05)	3.86	1.65	50.41	0.20	0.29

The genotype CP13 was found to have the heaviest fruit (1200.18 g) followed by CP5 (1121.62 g), CP12 (1053.03 g), and CP11 (984.16 g). While the genotype CP20 (218.69 g) had the lowest values for single fruit weight. Nine genotypes *viz.,* CP3, CP5, CP6, CP7, CP9, CP10, CP11, CP12, and CP13 recorded values higher than the grand mean (626.20). The genotype showed a wide range of 218.69 g to 1200.18 g for this trait.

Significant differences were observed for this trait among the different genotypes. The mean values for the number of fruits plant^{-1} ranged from 2.58 to 4.75. The genotype CP13 recorded the highest number of fruits plant^{-1} (4.75) followed by CP1 (4.33), CP12 (4.30), and CP8 (4.22), while the genotype CP20 recorded the lowest number of fruits plant^{-1} (2.58). Among the long genotypes, the highest number of fruits plant^{-1} was recorded in CP13. In the round genotypes, the highest number of fruits plant^{-1} was found in CP14 (4.01). The CP1, CP3, CP4, CP7, CP8, CP9, CP12, CP13 and CP14 genotypes were statistically at par with grand mean (3.57).

Among the round varieties, CP14 (1.67 kg) recorded the highest fruit yield plant^{-1}. The long genotype CP13 (5.64 kg) recorded the highest fruit yield plant^{-1}. With a grand mean of 2.30, the range of fruit yield plant^{-1} was from 0.62 kg to 5.64 kg. The genotype CP13 (5.64 kg) had the highest fruit yield plant^{-1}, followed by CP12 (4.58 kg), CP9 (3.09 kg), and CP7 (3.08 kg), while the genotype CP20 had the lowest fruit production plant^{-1} (0.62 kg). The ten genotypes *viz.,* CP3, CP5, CP6, CP8, CP9, CP10, CP11, CP12 and CP13 produced statistically at more values than the grand mean of fruit yield plant^{-1}. Similar differential performance in yield and yield attributes in summer squash was reported by El-Hadi (2020), El-Gazzar *et al*. (2020), Shrestha *et al.* (2021), Sajid *et al*. (2022), Soliman (2022) in summer squash, Ramjan *et al*. (2018), Suu (2018) and Suresh *et al*. (2020) in pumpkin.

Conclusion

Therefore, based on the results, the CP 13 was identified as a superior performance genotype in fruit weight, number of fruits plant^{-1} and greatest production potential under tropical condition.

Conflict of Interest: None

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