



Evaluation of Cassava Varieties in Tiruppur District of Tamil Nadu

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ABSTRACT

Field experiments were conducted during 2020-21 to assess the performance of high yielding cassava varieties YTP 2 (Yethapur 2) and Sree Athulya. They were compared with traditionally cultivated type called Mulluvadi Local. The trial was conducted at ten different locations of Vellakovil block of Tiruppur district during *rabi* 2020. The results showed that, YTP 2 recorded maximum plant height (197.21 cm), stem girth (9.78 cm), number of leaves (32.56) and canopy spread (62.36 cm) at harvest. Number of roots (7.78), maximum length of the root (38.05 cm), maximum girth of the root (21.22 cm), root yield (6.38 kg/plant), estimated root yield (41.37 t/ha) and starch content (29.40 %) were also highest in YTP 2. In addition, it was highly resistant to cassava mosaic disease. The benefit cost ratio was highest in YTP 2 (2.30) and concluded that, YTP 2 can be recommended for large scale cultivation in Vellakovil block of Tiruppur district.

Key Words: Cassava, Varieties, Yield, YTP 2, Sree Athulya, Mulluvadi.

INTRODUCTION

Cassava (*Manihot esculenta* Crantz) was cultivated in an area of 89, 610 ha with a production of 2.86 Mt having the productivity of 31.94 t/ha during 2017-18 (Anonymous, 2018). In Tamil Nadu, more than 80 per cent of cassava roots produced is processed into sago and starch (Krishnakumar *et al*, 2020) but in Kerala and north eastern states, cassava is consumed directly by the people. Cassava is rich in starch and varies according to the varieties. In addition, it is a good source of minerals like calcium, iron, magnesium and phosphorus besides having good calorific value. Most of the farmers are cultivating Mulluvadi Local cassava type with lesser productivity. In addition, farmers of Tiruppur district are facing difficulties like lack of high yielding varieties, low market price, low starch content, pest and disease problems

like cassava mosaic disease and spiraling white fly, lack of processing facilities etc., which causes poor returns. The area under cassava is slowly decreasing nowadays. Fluctuation in price of cassava roots also makes the farming a non-profitable. Considering the situation, a study was undertaken to find out a high yielding cassava variety suitable for Tiruppur district which would strengthen the income of the farming community.

MATERIALS AND METHODS

The study was carried out in ten different locations of Vellakovil block of Tiruppur district during *rabi* 2020. The experimental material used in this study consisted of two different varieties of cassava *Viz.*, YTP 2 (Yethapur 2) and Sree Athulya and one local type 'Mulluvadi Local'. YTP 2 was released by Tapioca and Castor Research Station,

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Table 1. Performance of cassava varieties in Tiruppur district.

Characters /Varieties	Mulluvadi Local	Sree Athulya	YTP 2	CD (5%)
Plant height (cm)	190.44	193.14	197.21	3.36
Stem girth (cm)	8.10	9.27	9.78	0.45
Number of leaves	31.23	31.72	32.56	0.50
Canopy spread (cm)	60.57	58.12	62.36	1.18
Number of roots	7.30	7.51	7.78	0.12
Maximum length of the root (cm)	37.41	37.12	38.05	0.38
Maximum girth of the root (cm)	20.58	20.76	21.22	0.22
Root yield (kg/plant)	5.37	5.63	6.38	0.40
Estimated root yield (t/ha)	34.71	36.43	41.37	2.45
Starch content (%)	28.72	29.21	29.40	0.12
Duration (days)	272	303	287	-
Cassava mosaic disease score	2.5 (susceptible)	2.2 (susceptible)	1.1 (highly resistant)	-

TNAU, Yethapur, Tamil Nadu during 2020. It is a clonal selection from germ plasm collection. It has erect, medium growing and top branching type. It has a yield potential of 46.2 t/ha. Duration is 270-300 d. Starch content is 29.62 %. Tolerant to Cassava Mosaic Virus incidence and the grade is 1. Tolerant to drought and salt. It is recommended for cultivation in Tamil Nadu. Sree Athulya was released during 2013 by CTCRI, Trivandrum, Kerala. It is a high yielding (39.00 t ha⁻¹) variety with high starch content (34.80%) and has been recommended for release and cultivation in the States of Tamil Nadu and Andhra Pradesh. The roots are long cylindrical with brown skin and white flesh. The cultivar is suitable for starch extraction as well as cattle feed. Maturity in 10 months.

These two varieties were compared with a local type called Mulluvadi Local. It has a yield potential of 34 t/ha with 9 months duration. It is tolerant to cassava mosaic disease and having 35 % starch. The experimental area has an average rainfall of 529 mm. The annual day temperature varies from 30 ° C (Nov. – Jan.) to 38 ° C (May). The night temperature ranges from 21 ° C (Dec.) to 27 ° C (May). The soil type is sandy clay loam with a pH

of 7.8 and EC is 0.15 ds/m. It has 0.35 % organic carbon, 191 kg available N, 23 kg available P and 144 kg of available K. The micronutrient status is 4.36 ppm iron, 1.84 ppm manganese, 0.97 ppm zinc and 1.16 ppm copper. The experiment was carried out in Randomized Block Design (RBD) with ten replications. The crop was raised during rabi 2020. Regular agronomic practices were carried out (Anonymous, 2020) for all the varieties. The crop was grown under irrigated condition. The spacing adopted was 90 x 90 cm and 25 t FYM were applied and incorporated at the time of planting. A basal dose of 45:90:120 kg of NPK/ha was applied and 45:120 kg of NK/ha was applied during earthing up (90 d after planting). In addition, 25 kg of zinc sulphate, 20 kg sulphur as gypsum and 10 kg borax were applied per hectare as basal. At 60th day, the crop was thinned to two shoots per plant. Hand weeding was followed to remove the weeds. Plant protection measures were carried out on need basis. The crop was harvested during 9-10 months after planting depending upon the variety. Five plants per variety per replication were selected for recording observations. Observations on plant height (cm), stem girth (cm), number of leaves and canopy spread (cm) were recorded at harvest. Plant height

was measured from the base of the stem to the topmost new leaf. Stem girth was taken at the base of the stem. *Canopy* spread was *measured* from both sides of the plant.

Number of roots, maximum length of the root (cm), maximum girth of the root (cm), root yield (kg/plan¹), estimated yield (t/ha) and starch content (%) were recorded after harvest. Length of the longest root was taken for measuring the length. The root which was taken for measuring the length was used to measure the girth and it was measured at three portions of the root and the average was worked out. The data were subjected to statistical analysis (Panse and Sukhatme, 1985).

The disease severity scores were given as described by Lokko *et al* (2005) for the cassava mosaic disease. The severity score 1 was highly resistant (HR), severity score class [1.1–2] was resistant (R), severity score class [2.1–3] was susceptible (S) and severity score class [3.1–5] was highly susceptible (HS). The benefit cost ratio was worked out. The cost of selling of roots is Rs. 5 per kg at farm gate level.

RESULTS AND DISCUSSION

Morphological characters

YTP 2 cassava produced significantly highest values for all the morphological parameters. Plant height was highest in YTP 2 at the time of harvest (197.21 cm) followed by Sree Athulya (193.14 cm). Mulluvadi local recorded the lowest. Maximum stem girth, number of leaves and canopy spread were recorded in YTP 2 (9.78cm, 32.56 and 62.36 cm). It was due to the genetic character of YTP 2. The lowest values for these parameters were recorded by Mulluvadi Local.

Yield and attributing characters

Number of roots (7.78), maximum length of the root (38.05 cm), maximum girth of the root (21.22 cm), root yield per plant (6.38 kg) and estimated root yield per hectare (41.37 t) were highest in YTP

2. Similar trend of yield attributes was noticed by Pugalandhi *et al.*, during 2021 in YTP 2 cassava. This was attributed to the increased vegetative traits like plant height, stem girth, number of leaves and canopy spread recorded in YTP 2. In addition, the highest values for yield traits *viz.*, number of roots, length of the roots, girth of the roots and per plant root yield recorded in YTP 2 might have contributed for the increased yield. This result was supported by Babu Rao *et al* (2015 and 2017) in cassava. He reported positive and significant correlation of root yield with plant height, stem diameter, number of roots, root length and root diameter. The resistance nature of YTP 2 to cassava mosaic virus disease also might have contributed for increased root yield. YTP 2 took 287 days for harvest whereas Mulluvadi Local took 272 d which was the lowest.

Quality

When compared to other varieties, the starch content was highest (29.40 %) in YTP 2. Pugalandhi *et al* (2021) noticed a similar trend in their trial with YTP 2. In addition, Kanvint Maraphum *et al* (2021) reported positive correlation of starch with dry matter content in cassava. Maximum values for vegetative characters like plant height, stem girth, number of leaves and canopy spread registered in YTP 2 might have contributed for increased dry matter content which reflected in increased starch content.

Resistance to pest and diseases

With regard to cassava mosaic disease score, YTP 2 recorded the lowest value of 1.1 which indicates that it is highly resistant whereas Sree Athulya and Mulluvadi Local got the values of 2.2 and 2.5, respectively which indicated their susceptibility. The maximum BC ratio of 2.30 was obtained in YTP 2. The highest root yield and lowest cassava mosaic disease incidence registered in YTP 2 reflected in the increased BC ratio. The lowest was obtained in Mulluvadi Local (1.74).

Table 2. Economic analysis of cultivation of cassava per hectare in Tiruppur district.

Varieties	Gross cost (Rs./ha)	Gross income (Rs./ha)	Net income (Rs./ha)	Benefit Cost Ratio
Mulluvadi Local	1,00,000	1,73,550	73,550	1.74
Sree Athulya	95,000	1,82,150	87,150	1.92
YTP 2	90,000	2,06,850	1,16,850	2.30

CONCLUSION

It can be concluded that, YTP 2 was a promising variety and can be suggested for large scale cultivation in Vellakovil block of Tiruppur district. It can also be promoted through various extension activities. Making the setts available to the farmers could increase the area of this variety.

REFERENCES

- Anonymous. 2018. *Horticultural statistics at a glance*. Horticulture Statistics Division, Department of Agriculture, Cooperation and Farmers' Welfare, Ministry of Agriculture and Farmers' Welfare, Govt. of India, Controller of publication.
- Anonymous (2020). Crop production guide – Horticulture crops 2020. Directorate of Horticulture and plantation crops, Chepauk, Chennai and Tamil Nadu Agricultural University, Coimbatore.
- Babu Rao B, Ashok P, Ramanandam G and Sasikala K (2015). Trait association and path coefficient analysis in cassava. *Int J Veg Sci* **21** (4) : 402-415.
- Babu Rao B, Swami D V, Ashok P, Kalyana Babu B, Ramajayam D and Sasikala K (2017). Correlation and path coefficient analysis of cassava (*Manihot esculenta* Crantz) genotypes. *Int J Curr Microbiol App Sci* **6**(9) :549-557.
- Kanvint Maraphum, Khwantri Saengprachatanarug, Seree Wongpichet, Arthit Phuphuphud, Panmanas Sirisomboon and Jetsada Posom (2021). Modified specific gravity method for estimation of starch content and dry matter in cassava. *Hellion* **7**(7) : e07450.
- Krishnakumar T, Sajeev M S and Suja G (2020). Effect of planting methods and varieties on performance of modified TNAU cassava harvester. *Int J Chem Studies* **8** (5) :997-1002
- Lokko Y, Danquah E Y, Offei S K, Dixon A G O and Gedil M A (2005). Molecular markers associated with a new source of resistance to the cassava mosaic disease. *Afr J Biotechnol* **4**:873–881.
- Panase V G and Sukatme P V (1985). Statistical methods for agricultural workers, Indian Council of Agricultural Research, New Delhi.
- Pugalendhi L, Velmurugan M, Kavitha P S, Kalarani M K, Senthil N, Deivamani M and Venkatachalam S R (2021). Evaluation and characterization of high yielding cassava mosaic resistant variety YTP 2. *Int J Plant and Soil Sci* **33**(22): 198 – 208.

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