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Assessment of finger millet (*Eleusine coracana*) genotypes for higher productivity in central dry zone of Karnataka

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Abstract
A field trial was conducted at Shidalinakote of Chitradurga district, Karnataka, India, during *Kharif*, 2016 and 2017 to study the "Assessment of finger millet genotypes for higher productivity in central dry zone of Karnataka". The results of the two years pooled data revealed that, among the different genotypes of finger millets, ML-365 recorded significantly higher plant height (115.8 cm), 1000 seed weight (23.6 g) ear length (9.35 cm), number of tiller (7 per plant), seed yield (21.8 q ha^{-1}), net returns (Rs.39540 ha^{-1}) and B:C ratio (2.84) and it was on par with KMR-204. However, lowest grain yield (14.20 q ha^{-1}) and economics were obtained in local farmer's variety (Karmandala).

Keywords: Ear length, seed yield, test weight and economics

Introduction
The millets, a group of thousands of varieties of grass-like annual plants that bear small sized seeds belong to the Gramineae family. Today millet is considered the 6th most important grain crop in the world. Millet has been a major source of protein and energy for millions of people in Asia, Africa and India for thousands of years. While wheat and rice might provide only food security, millets produce multiple securities (food, fodder, health, nutrition, livelihood and ecological) making them the crops of agricultural security

Millets as Climate Change Resilience Crops
Climate Change is expected to confront us with three challenges. Increase in temperature upto 2-5 degree Celsius. Increasing water stress and severe malnutrition. It is important to note that with the projected 2 degree celsius temperature rise, wheat might disappear from our midst, since it is an extremely thermo sensitive crop. Similarly, the way rice is grown under standing water makes it a dangerous crop under climate change conditions. Methane emanating from water-drenched rice fields, is a green house gas, that severely threatens our environment. Millets are all-season crops whereas wheat is season specific. The rainfall needed for Sorghum, Pearl Millet and Finger Millet is less than 25% of sugarcane and banana, and 30% that of rice. Millets grow under non-irrigated conditions in such low rainfall regimes as between 200 mm and 500 mm.

Millets are the small seeded cereal grain crops. They can be cultivated where no other food crops can be profitably grown, among them, finger millet being a one of the important staple food crop of Karnataka and commonly known as "Nutri-cereals" which is superior in quality compared to cereal crops such as than rice and wheat. Large amounts of calcium, good source of iron along with richness in fibre content and low glycaemic index reflects the health benefits of finger millet. It is one of the important crop for small and marginal farmers especially under rainfed situations because of its short duration and ensures the capacity to withstand drought. It is mainly cultivated with very meagre input usage on low fertility soils. On the other hand the growing needs of the people and increased awareness about the health of the children has made the Government to give more emphasis and support to the finger millet farmers, so as to enhance the productivity.

But still many farmers are not using high yielding and disease resistant varieties for higher productivity.

In India, it is being grown over an area of 2.5 m ha with an annual production of 2.6 m tonnes of grain and productivity is 1208 kg ha^{-1}. Though it is grown all over the country, more than 60% of the area and production are concentrated in Karnataka, Tamil Nadu and Andhra Pradesh. (Anon., 2021) [1].

Reason for low productivity in finger millet

Finger millet is one of the most important food crop of Chitradurga district. It is cultivated in an area of 44901 ha with a total production of 91437 MT and average productivity of 2036 kg ha^{-1}. But yields obtained by farmers in the region are lower due to several reasons. The problem analysis revealed that the lower yields were due to lack of knowledge on use of improved varieties, existing varieties are susceptible to neck blast and lodging, imbalanced nutrient management, non-application of bio fertilizers, lack of knowledge on split application of fertilizers, micronutrients, stem borer and neck blast. Keeping these points in consideration, the following trial was conducted through Krishi Vigyan Kendra in Chitradurga to study the performance of finger millets genotypes for higher productivity in central dry zone of Karnataka.

Materials and Methods

The trial was conducted in Shidalinakote of Chitradurga district, Karnataka during *Kharif* 2016 and 2017 to study on "Assessment of finger millet genotypes for higher productivity in central dry zone of Karnataka". This study comprised of three varieties *viz*., ML-365, KMR-204, GPU-28 and Kadaramandalagi. The demonstration was conducted farmers field at Shidalinakote. The nursery was raised using the different finger millet genotypes in raised nursery beds of 25' long, 4' width and 4'' height. After attaining the age of 20 days the seedlings were used for transplanting in the main field with a spacing of 30 cm x 15 cm. Fertilizers were applied as per the treatments. The RDF used was 100:50:50 kg N: P_2O_5: K_2O per ha. Fifty percent of the recommended nitrogen, total phosphorus and potassium were applied as basal dose at the time of transplanting. Necessary plant protection measures were taken as per the requirement. The experiment was laid out in RCBD with five replications. Periodical observations were recorded. The data so obtained were subjected to statistical analysis as per the standard procedures given by Gomez and Gomez (1984) [3].

Results and Discussion

The genetic, climatic and soil factors greatly influenced the plant growth, seed yield and yield parameters of finger millet. Different varieties showed significant influence on growth and yield attributes of finger millet. The two years pooled data results showed that, among the tried finger millet genotypes, ML-365 recorded (table 1) significantly higher seed yield (21.80 q/ha) over Kadaramandalagi (13.7 q/ha). However, it was on par with KMR-204. The higher seed yield obtained this variety mainly due to higher yield parameters *viz.*, 1000 seed weight (23.6 g) and ear length (9.35 cm) (table 2) over Kadaramandalagi (17.7 g, 6.7 cm, respectively). Nigade and More, 2013 [7] also reported similar results. The higher yield parameters in ML-365 due to more plant height, number of tiller, and tolerant to neck blast disease. However, all the growth and yield attributing parameters were observed to be on par with that of KMR 204. The variation in seed yield of different genotypes may be due to climatic diversities and genetic makeup of the genotypes. More absorption of nutrients might have resulted in vigorous growth which is indicated by increased plant height and tiller number which finally contributed to enhancement in yield attributing characters and ultimately resulted in higher grain yield in ML-365. A similar result was also obtained by Shubhashree *et al*., 2022 [10]. Among the response of three varieties under integrated nitrogen management in coastal region of Annamalai Nagar, Tamil Nadu, CO 13 and CO 14 performed well by recording higher grain yield (Raman, 2004) [8]. Similarly the use of improved variety CL 149 produced significantly higher yield than the local varieties. (Singh and Arya, 1998) [11]. Rangasamy and Kumarasamy (1974) [9] studied that variety influences in increasing crop yield either by acceleration of respiratory processes by increasing cell permeability, by hormone growth action, or by combination of all these processes. This peculiarity of genotypes is of great importance when evaluating the genotypes with stability. However, yield variations were noted, which may be attributed to climatic diversity and genetic make up of the genotypes as well. Such variations in the yield of different genotypes were also reported by Khan *et al*. (2001) [4]. Mahapatra (1998) [5] found significant variation among the eleven varieties tested being maximum with Dibyasingh followed by AKP 7 in Orissa. Nigade *et al*. (2011) [6] reported that, the long and medium duration variety responses to higher level of fertilizer application.

Among the different genotypes evaluated higher gross returns (Rs.61040 ha^{-1}), net returns (Rs.39540 ha^{-1}) and B: C ratio (2.84) was obtained (table 3) with ML-365 finger millet variety as compared to check variety. This increased economic returns, was due to improvement in grain yield of finger millet. The results are in conformity with that of Chavan *et al*., 2017 [2].

Table 1: Growth parameters of finger millet as influenced by different genotypes

Particulars	Plant height (cm)	No. of tillers/plant	Fingers/plant
ML-365	115.8	7.0	11
KMR-204	111.6	6.0	10
GPU-28	104.3	5.0	09
Karmandala	98.3.0	4.0	08
S.Em±	1.52	-	-
CD (0.05)	5.63		

Table 2: Yield parameters of finger millet as influenced by different genotypes

Particulars	Ear length (cm)	1000 seed wt (g)	Yield (q/ha)
ML-365	9.35	23.6	21.80
KMR-204	9.12	22.4	19.90
GPU-28	7.12	20.3	16.35
Karmandala	6.7	17.7	14.20
S.Em±	0.41	0.72	0.63
CD (0.05)	1.25	2.28	2.13

Table 3: Economics and disease incidence of finger millet as influenced by different genotypes

Particulars	Gross returns (Rs./ha)	Net returns (Rs./ha)	B:C ratio	Neck blast (%)
ML-365	61040	39540	2.84	0.00
KMR-204	55720	34770	2.66	9.5
GPU-28	45780	27280	2.47	10.6
Karmandala	39760	21860	2.22	16.3
S.Em±	-	-	-	-
CD (0.05)	-	-	-	-

Conclusion

From this study, it can be concluded that, ML365 finger millet variety was superior in seed yield and disease resistant over check variety (Kadaramandalagi) and it was on par with KMR-204.

References

1. Anonymous. Area, production and yield of cotton in India (major states). Technical Report, Directorate of Economics and Statistics, Department of Agriculture and Cooperation, New Delhi, 2021, p. 77.
2. Chavan IB, Jagtap DN, Mahadkar UV. Economics of Finger Millet (*Eleusine coracana* L. Gaertn.) Influenced due to different dstablishment dechniques, levels and time of application of nitrogen. International Journal of Tropical Agriculture. 2017;35(4):839-848.
3. Gomez KA, Gomez AA. Statistical procedures for agricultural research (2 ed.). John wiley and sons, New York; c1984. p. 680.
4. Khan A, Rahim A, Khan MI. Yield response of groundnut genotypes under the sub-mountainous conditions of Malakand Division (NWFP), Pakistan. Pak. Journal Biol. Sci. 2001;4(4):404-406.
5. Mahapatra SC. Yield performance of ragi varieties under rainfed conditions. J Eco. Biol. 1998;10(4):317-319.
6. Nigade RD, Jadhav BS, Bhosale AS. Response of finger millet long duration variety to different levels of nitrogen under rainfed conditions. International Journal. Agric. Sci. 2011;7(1):152-155.
7. Nigade RD, More SM. Performance of finger millet varieties to different levels of fertilizer on yield and soil properties in sub-montane zone of Maharashtra. International Journal of Agricultural Sciences. 2013;9(1):256-259.
8. Raman R. Response of integrated nutrient management on finger millet varieties. MSc (Ag.) Thesis, Annamalai University, Annamalai Nagar, Tamil Nadu; c2004.
9. Rangasamy P, Kumarasamy K. Response of long duration finger millet varieties to farm yard manure and nitrogen. Madras Agric. Journal. 1974;61(8):423-426.
10. Shubhashree KS, Raveendra HR, Deepak CA, Sahana SR. Assessment of pre-released finger millet genotypes to varied levels of fertilizer application. The Pharma Innovation Journal. 2022;11(10):1876-1878.
11. Singh RV, Arya MPS. Effect of improved package of practices on grain yield of finger millet. Bharatiya Krishi Anusandhan Patrika. 1998;13(1/2):73-76.