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Research Paper

Agronomic Evaluations of Single Cross Maize (*Zea mays* L.) Hybrids under Zone 3 of Karnataka

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ABSTRACT

Production and productivity of maize may be increased with the hybridization. Assessing maize hybrids in the particular climatic condition is one of the most important key tasks for producing hybrid maize. The current study was conducted to identify the most suitable hybrid maize for climatic zone three of Karnataka. The field trial was conducted during the *Kharif* Season of 2021-2022 at Agricultural Research Station, Arabhavi field of University of Agricultural Sciences, Dharwad. The statistical design adopted for the study was eight hybrids in a randomized complete block design (RCBD) with three replications. The results suggested that among tested hybrids, NMH 36 (12.60 tons ha^{-1}) of UPL Limited (Advanta Limited), Hyderabad, followed by NMH 777(11.10 tons ha^{-1}) of UPL Limited (Advanta Limited), Hyderbad, compared with the National Check, NK 6240 (11.30 tons ha^{-1}) and private check 900M-Gold (11.20 tons ha^{-1}). Hence, the study suggested that NMH 36 and NMH 777 of UPL Limited (Advanta Limited) could be chosen as promising hybrids for the maize growers in zone 3 of Karnataka.

HIGHLIGHTS

- Choice of location-specific maize hybrid is essential for productivity enhancement.
- The present study suggests that NMH 36 and NMH 777 of UPL Limited (Advanta Limited) can be chosen as promising maize hybrids the zone 3 of Karnataka.

Keywords: Performance, Maize hybrids, Evaluation, hybrids, Zone 3

Due to its enormous importance in the dieting of humans and animals and its great yielding capacity, maize is popularly known as the queen of cereals. It is also called a "Miracle crop" as it efficiently utilizes solar energy to produce huge yield (Maitra *et al*. 2020; Ghosh *et al*. 2020). The maize contributes quality protein to the human diet and ensures food and nutritional security (Rawool, 2004). The area and production of maize in India are about 9.23 million hectares and 23.73 MT, respectively, with average productivity of 2564 kg ha^{-1} (Anonymous, 2015). The cultivation area and production of maize are followed by rice, wheat, and sorghum. Hilly people consume it as a staple food; however, maize is versatile and use in our countries as food, feed, and industrial products (Ghosh *et al*. 2021; Swamy *et al*. 2022). Major production states in India are UP which Karnataka follows, Maharashtra, Bihar, Rajasthan, Madhya Pradesh etc. (Dayanand and Jain, 1994: Maitra *et al*. 2020).

Inconsistent climate has a major influence on the yield and quality of the maize produce. Lack of water availability and increasing temperature

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influence the crop yield and quality adversely. Some of the prospective adaption techniques like varying the date of sowing, crop rotation, and integrated farming system may be used to combat the changing climate. Appropriate sowing date is the most significant method to lessen the effect of climate change. The selection of a suitable hybrid with an appropriate sowing date may be a superior agronomic option to cultivate maize under zone 3 of Karnataka state. Additionally, it requires assessing the different maturity hybrids of maize for their growth and yield under varying sowing dates (Parashar, 2011).

MATERIALS AND METHODS

The hybrids under evaluation were sown in randomized complete block design with three replications with a spacing of 60 cm between the rows and 20 cm between the plants. Each entry was raised in four rows of 4-meter length by dibbling two seeds per hill and later thinned down to a single seedling after 15-18 days after sowing. The standard recommended package of practices was followed to raise a healthy and disease-free crop.

At the pre-flowering stage, initial plant count was recorded from the entire four rows and in all three replications, followed by days to 50 % pollen shedding and days to 50 % silking was recorded. Later five randomly chosen plants were selected for recording plant height (cm) and ear height traits (cm). Cob weight per plot, cob number, and moisture (%) were recorded at the time of harvest of the crop. Furthermore, ten cobs were randomly selected and shelled, and grain weight and pith weight were documented. Shelling percent was calculated using the grain weight and pith weight of these ten sampled cobs. Cob weight per plot, moisture (%), and shelling (%) were used to calculate grain yield and expressed at 15 percent moisture. The grain yield was computed using the below-mentioned formula.

Grain yield (tons) =

$$\frac{\left[\begin{array}{c}\text{Cob weight}\ (100 - \%\ \text{grain moisture}) \\ \text{Shelling per cent} \times 10000\end{array}\right]}{(100 \times \text{Per cent grain moisture} \times \text{plot area})} \Big/ 1000$$

STATISTICAL ANALYSIS

The obtained field data were subject to statistical analysis to compute all the critical differences and the variance (Sunder Raj *et al*. 1972).

RESULTS AND DISCUSSION

Among the hybrids tested for their yield performance, the hybrid from UPL Limited (Advanta Limited), Hyderabad, NMH 36 recorded the highest in all the yield attributing characteristics like ear height (68.30 cm), cob weight (11.50 kg) and shelling percentage (95.00 %) with highest recording yield of 12.60 tonnes per hector which was followed by the hybrid NMH – 777 from UPL Limited (Advanta Limited), Hyderabad, ear height (56.30 cm), cob weight (11.30 kg) and shelling percentage (92.00 %) with the yield of 11.10 tonnes per hector. These results indicate that the, among the tested entries at the Agricultural Research Station, Arabhavi, NMH 36 from UPL Limited (Advanta Limited), Hyderabad was, showed a significantly higher yield than other entries. Hence, the experiment showed that the above hybrid is suitable for zone 3 of Karnataka.

The results indicate that the test hybrid NMH 36 from UPL Limited (Advanta Limited), Hyderabad was the highest yielding maize hybrid with 12.60 t ha^{-1} grain yield (Table 1), and it was numerically superior over the National check hybrid NK-6240 by 12.8 percent and over popular private hybrid check CP-818 by 11.7 percent. It was followed by Ajeet 469 from (Ajeet Seeds Pvt. Ltd., Chitegaon) recorded 11.54 t $ha^{-1,}$ and Ajeet-Surya (Ajeet Seeds Pvt. Ltd., Chitegaon) recorded 10.00 t ha^{-1}. The obtained results are in line with earlier studies in the direction (Jadhav *et al*., 2015; Hemalatha *et al*., 2013; Sulochana *et al*. 2015).

The ancillary data of the test hybrids compared with the check hybrids (Table 2) indicated that the test hybrids were on par for days to 50% flowering and days to 50% silking with the check entries. The yield contributing traits Cob length, No of Kernel rows, and No of Kernels/ row in the test hybrid NMH 36 recorded were significantly superior over National check NK-6240.

Table 1: Grain yield of the test hybrids over the check hybrids

Sl. No.	Source of hybrids	Entry	Grain yield (t/ha)
1	UPL Ltd (Advanta Ltd), Hyderabad	PAC 741	11.10
2	UPL Ltd (Advanta Ltd), Hyderabad	ADV 768	12.60
3	Ajeet Seeds Pvt. Ltd., Chitegaon	Ajeet 469	11.70
4	Ajeet Seeds Pvt. Ltd., Chitegaon	Ajeet 479	9.80
5	Ajeet Seeds Pvt. Ltd., Chitegaon	Ajeet Surya	10.0
	Checks		
6	Local check	GH 0727	10.60
7	National check	NK 6240	11.30
8	Private check	900M Gold	10.70
	S.Em +		1.37
	C.D. @ (5.0%)		3.12
	C.V. %		5.85

Table 2: Mean ancillary data of the test hybrids in comparison with checks

Genotype	Days to 50% Pollination	Days to 50% Silk	Plant height (cm)	Ear height (cm)	Cob weight (kg)	Final Stand	Moisture	Shelling %	100- M	Grain Yield t /ha
NMH 777	66.0	69.0	167.0	56.3	11.3	121.0	23.67	92.0	76.33	11.1
NMH 36	64.7	68.0	184.3	68.3	11.5	121.3	23.00	95.0	77.67	12.6
Ajeet 469	65.3	67.0	163.7	62.0	11.3	115.7	22.2	95.0	78.9	11.7
Ajeet 479	70.0	73.3	204.7	64.3	10.3	117.3	25.1	77.0	75.7	9.8
Ajeet Surya	68.7	73.7	182.0	63.3	8.5	122.0	19.7	86.0	81.5	10.0
Checks										
GH 0727	60.0	61.0	158.0	59.7	1.0	104.7	24.33	85.2	74.67	10.6
NK 6240	63.3	66.0	186.7	63.3	1.1	112.0	21.00	82,4	77.67	11.3
900M Gold	64.7	66.7	179.0	65.7	1.2	116.7	22.33	77.9	75.67	11.2
S.Em±	1.20	1.22	20.53	3.52	0.08	6.40	0.84	3.18	0.72	1.37
C.D. @ (5.0%)	3.17	3.72	62.30	10.68	3.26	19.42	2.66	9.27	2.61	3.12
C.V. %	2.72	2.12	19.96	9.69	13.35	9.53	6.51	10.24	4.58	5.85

CONCLUSION

Among the five test hybrids from UPL Limited (Advanta Limited), Hyderabad, and Ajeet Seeds Pvt. Ltd., Chitegaon, the test hybrid NMH 36 recorded the highest grain yield of 12.60 t ha^{-1}. It was superior to the National Check (NK-6240) by 11.3 percent and also over popular private hybrid (900M-Gold) by 11.2 percent. This was followed by another test hybrid Ajeet 469 and Ajeet Surya, which recorded 11.70 t ha^{-1} and 10.00 t ha^{-1} grain yield, respectively.

REFERENCES

Anonymous, 2015. The current status of maize production, published on website – http: //www.indiastat.in (Accessed 29 August 2015).

Dayanand and Jain, O.P. 1994. Rabi maize cultivation for enhanced production. *India Fm*., **43**(10): 11-12.

Ghosh, D., Brahmachari, K., Brestic, M., Ondrisik, P., Hossain, A., Skalicky, M., Sarkar, S., Moulick, D., Dinda, N.K., Das, A., Pramanick, B., Maitra, S. and Bell, R.W. 2020. Integrated Weed and Nutrient Management Improve Yield, Nutrient Uptake and Economics of Maize in the Rice-Maize Cropping System of Eastern India. *Agron.*, **10**: 1906.

Ghosh, D., Brahmachari, K., Das, A., Hassan, M.M., Mukherjee, P.K., Sarkar, S., Dinda, N.K., Pramanick, B., Moulick, D., Maitra, S. and Hossain, A. 2021. Assessment of Energy Budgeting and Its Indicator for Sustainable Nutrient and Weed Management in a Rice-Maize-Green Gram Cropping System. *Agron.*, **11**: 166.

Hemalatha, S., Sreelatha D., Anuradha, M. and Saikumar, R. 2013. Crop weather relations in maize. *J. Agrometeorl*, Andhra Pradesh, **15**(92): 165-166.

Jadhav, A., Kumar A., Singh, A.K., Singh, I. and Das, T.K. 2015. Response of maize hybrids (*Zea mays* L.) to staggered sowing. *Indian J. Agron*., **60**(3): 476-478.

Maitra, S., Shankar, T., Manasa, P. and Sairam, M. 2019. Present Status and Future Prospects of Maize Cultivation in South Odisha. *Int. J. Biores. Sci.*, **6**(1): 27-33.

Parashar, A. 2011. Phenology and productivity of maize cultivars as influenced by crop weather environment. M.Sc. Thesis, Maharana Pratap University of Agriculture and Technology, Udaipur.

Rawool, H.V. 2004. Effect of integrated nutrient management on yield and nutrient balance in maize (*Zea mays* L.). *Indian J. Agril. Sci.*, **46**(4): 698-701.

Sulochana, Solanki, N.S., Dhewa, J.S. and Bajia, R. 2015. Effect of sowing dates on growth, phenology and agro meterological indices for maize varieties. *Int Quart. J. Life Sci.,* **10**(3): 1339- 1343.

Sunder Raj, N., Nagaraju, S., Venkararamu, M.N. and Jagannath, M.K. 1972. Designs and analysis of field Experiment, *Univ. Agril. Sci.*, Hebbal, Bangalore.

Swamy, G.V.V.S.N., Shankar, T, Maitra, S., Adhikary, R., Praharaj, S. and Sairam, M. 2022. Influence of nitrogen management on productivity and nutrient use efficiency of summer maize. *Res. Crop*, **23**(2): 313-320.