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Relative performance of maize varieties under Kymore Plateau and Satpura hill zone of Madhya Pradesh

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Abstract

A field experiment was conducted during Kharif 2024 at AICRP on Forage Crops, Department of Agronomy, College of Agriculture, JNKVV, Jabalpur (M.P.) to evaluate the relative performance of different maize varieties under Kymore Plateau and Satpura Hill Zone of Madhya Pradesh. The experiment was laid out in a Randomized Block Design with eight entries and three replications. The results revealed that among all the genotypes, ADV 7711 recorded the maximum plant height (186.58 cm), cob length (14.96 cm), number of cobs per plant (1.87), number of rows per cob (15.21), seed index (34.51 g), and grain yield (62.99 q/ha). The highest stover yield was exhibited by MM 1107 (147.62 q/ha). The economic analysis indicated that ADV 7711 gave the highest net monetary returns (Rs. 80,982/ha) and B:C ratio (3.50). All entries were found significantly superior to the check variety JM 216. It could be concluded that the genotype ADV 7711 was the best performer for obtaining higher yield and economic returns under Kymore Plateau and Satpura Hill Zone of Madhya Pradesh.

Keywords: Maize, Varieties, Grain yield, Stover yield, Economics, Kymore Plateau

Introduction

Maize (*Zea mays* L) is the most significant cereal crop in India's agricultural systems. Consequently, it is often called the "marvelous crop" or "cereal royalty." Maize, a key cereal crop, shows great adaptability to diverse agro-climatic conditions globally. This significant cereal is a staple food and livestock feed in developing nations. The plant's botany makes it significant for use as feed and for food due to its grains^[3]. It ranks as the third most significant crop in India, following rice and wheat, covering 8.67 million hectares with an average yield of 25.7 q/ha, whereas the global average is 49.40 q/ha. The rise in productivity was achieved through the ongoing cultivation of hybrid corn, which offers greater output per hectare and demonstrates a broad or location-specific adaptability. The aims of this study are to analyze the performance of various maize genotypes in field conditions and to evaluate the extent of diversity among the traits.

Materials and Methods

A field experiments was conducted to assess the performance of different maize varieties during kharif season of 2024 AICRP on Forage Crops, Department of Agronomy, College of Agriculture, Jabalpur (MP). The soil of the experimental field was sandy clay loam in texture, medium in organic carbon (0.61%), available nitrogen (365.20 kg N ha⁻¹) and phosphorus (17.97 kg P₂O₅ ha⁻¹) but high in available potassium (308.12 kg K₂O ha⁻¹). The soil was nearly neutral in reaction (7.24 pH) and concentration of soluble salts (0.35 ds m⁻¹) is below to the harmful limit. Seven varieties were sown in randomize block design and replicated thrice. The crop was fertilized as per the recommended dose of (120:100:60kg NPK/ha). The half dose of N and full dose P₂ O₅ as well as K₂O were applied as basal in the form of urea. SSP and MOP respectively. The remaining half dose of N was further split into two equal doses and top dressed at 30 DAS and 60 DAS, respectively. ADV 7154, PAC 7110, ADV 7711, PAC 741, PAC 745, Bio 9510 MM 1107 and JM 216 (Check)

Results

Growth Parameters

Data presented in Table 1 indicates that the plant population of different maize genotypes were similar in all the genotypes. The plant population among genotypes varies between 7.42 to 6.91 plants /m² it shows no significant effect. The maximum plant height was found genotype ADV 7711 (186.58 cm) and all entries was significantly superior to check genotype. While the maximum cob length was found in ADV 7711 (14.96 cm) and was closely followed by ADV 7154 (14.61cm) Genotypes PAC 7110 was numerically at par with rest of the genotypes in respect of cob length [7, 8, 15].

Yield attributes and yields

Data pertaining to cobs/plant, Cob Length, number of rows /cob, seed index and yields (grain and stover) were given in Table 2, the data indicates that among the genotypes ADV 7711 had maximum values of all the yield attributes except stover yield. The genotypes ADV 7711 also registered significantly higher

grain yield (58.89 q/ha) in comparison to all the genotypes. The maximum grain yield under ADV 7711 was sowing to higher number of cobs/plant (1.87), number of rows /cob (15.21), and seed index (62.99 g). While, higher stover yield was exhibited by MM 1107 (147.62/ha). Ihsan *et al.* [3] and Shah *et al.* [14] have reported significant amount of variability for different morphological traits. Dubey *et al.* [1, 2], Jha *et al.* [5, 6], and Yadav *et al.* [21] found similar result.

Economics

Economics of maize varieties under different planting geometry are presented in (Table 3) Results indicated that maize hybrid ADV 7711 given the highest net monetary returns and BC ratio followed by ADV 7754 compared to others. This difference might be due to higher test weight of the grains of the particular hybrid variety. Both of varieties did not differ significantly with respect to gross returns, net returns and B:C ratio [9]. These findings are due to their significant variation in producing grain and stover yield.

Table 1: Growth parameters of maize as influenced by different varieties

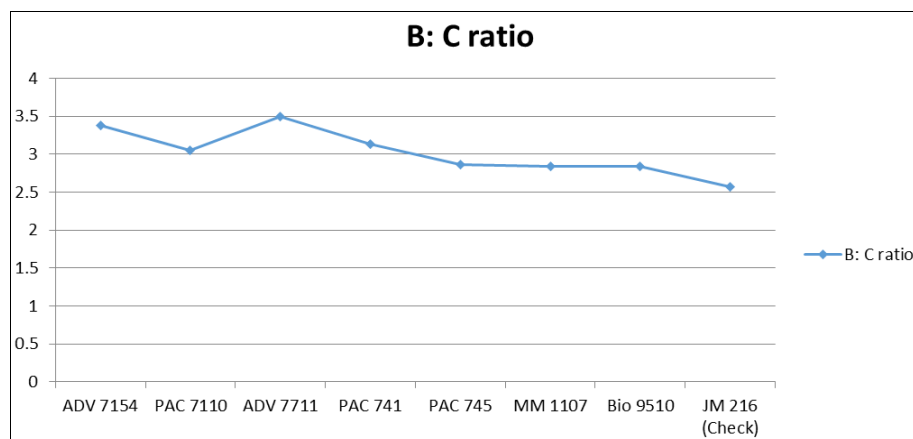
S. No	Entries	Plant population (m ²)	Plant height (cm)	Cob length (cm)
T ₁	ADV 7154	7.26	182.09	14.61
T ₂	PAC 7110	7.13	178.86	14.33
T ₃	ADV 7711	7.42	186.58	14.96
T ₄	PAC 741	7.14	179.12	14.09
T ₅	PAC 745	7.10	176.37	14.03
T ₆	MM 1107	7.06	170.24	14
T ₇	Bio 9510	6.97	168.25	13.79
T ₈	JM 216 (Check)	6.91	165.25	13.68
SEm ±		0.28	9.09	0.46
CD at 5%		NS	28.18	1.32

Table 2: Yield attributes and yields of maize as influenced by different varieties

S. No	Entries	Cobs/plant	No of Rows/ cob	Seed Index(g)	Grain Yield (q/ha)	Stover Yield (q/ha)
T ₁	ADV 7154	1.81	14.78	33.81	60.75	132.85
T ₂	PAC 7110	1.58	13.25	30.05	54.85	134.5
T ₃	ADV 7711	1.87	15.21	34.51	62.99	131.26
T ₄	PAC 741	1.62	14.45	35.865	56.4	135.11
T ₅	PAC 745	1.57	13.66	28.805	51.5	140.1
T ₆	MM 1107	1.42	13.3	28.205	51.1	147.62
T ₇	Bio 9510	1.48	13.51	31.12	51.13	143.33
T ₈	JM 216 (Check)	140.27	14.635	29.555	46.25	139.23
SEm ±		0.26	1.31	0.82	1.78	7.91
CD at 5%		0.81	4.12	2.49	5.32	22.24

Table 3: Effect of different treatments on economics

S. No	Entries	Cost of cultivation	Gross Monterey returns	Net monetary returns	B: C ratio
T ₁	ADV 7154	32400	109350	76950	3.38
T ₂	PAC 7110	32400	98730	66330	3.05
T ₃	ADV 7711	32400	113382	80982	3.50
T ₄	PAC 741	32400	101520	69120	3.13
T ₅	PAC 745	32400	92700	60300	2.86
T ₆	MM 1107	32400	91980	59580	2.84
T ₇	Bio 9510	32400	92034	59634	2.84
T ₈	JM 216 (Check)	32400	83250	50850	2.57



Conclusion

On the basis of one *Kharif* season (2024) results it could be concluded that the genotype ADV 7711 was found good for obtaining higher yield and all entries was found significantly superior to check JM 216 under kymore plateau and satpura hill zone of Madhya Pradesh.

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