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Evaluation of Maize (*Zea mays* L.) Hybrid Genotype Against Environmental Conditions of District Rawalakot, Azad Kashmir

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Abstract: The maximum increase in plant height was reported by variety Kashmir gold and Sarhad white. Kashmir gold outyielded all the hybrids under observation by producing 7768.3kg ha⁻¹. Sarhad white produced maximum 1000 kernel weight of 370g followed by Kashmir gold with 335g. Sarhad white produced more thicker plants with 3 cobs/plant. In this screening programme Sarhad white and Kashmir gold performed well, require less time to maturity and are recommended for general cultivation in District Rawalakot, Azad Kashmir.

Key word: Maize hybrid, Kashmir gold, Sarhad white, high corn, pioneer hybrid, Azad Kashmir

Introduction

Maize (*Zea mays* L.) is the world's third leading cereal crop after wheat and rice. Its average production in Pakistan is 1718 kg ha⁻¹ with total production of 1652000 tones (Zakir and Akbar, 2000). It is an important cereal crop, because of its high valued food for human beings, feed for livestock and poultry and a raw material for various agro-based industries (Chaudhary, 1983). Maize is an important cereal fodder commonly grown in Kharif season in Pakistan. This crop contains considerable amount of protein contents and provides a nutritious fodder for livestock balanced fodder for livestock feeding, during summer months (Khan and Gill, 1991). In Pakistan the principal maize growing areas lie in the two provinces, NWFP and Punjab, while Sind and Balochistan are far behind in maize cultivation. The leading divisions are Peshawar, Malakand, Hazara, D.I.Khan, Rawalpindi, Lahore, Multan and Bahawalpur. In Azad Kashmir maize is grown only for fodder purposes, although District Kotli, Bagh, Muzaffarabad and Mirpur having the environmental conditions which favours the maize cultivation but area under cultivation is very limited. There is no trend of growing maize for human consumption at District Rawalakot, where maize is grown only for fodder purposes. Although the soil and climatic conditions of the Azad Kashmir are favourable for maize production but its per acre yield is very low as compared to other maize growing areas. Low yield of maize is due to many constraints but area under cultivation and use of hybrid seed are considered to be the main factors which can increase yield on per unit area basis. Low yield also include poor management practices, low yielding varieties and inappropriate planting methods, lack of awareness about the recommended product technology adopted by the growers. Ibrahim (1989) mentioned the introductory

high yielding early maturing maize varieties and improved production products lead to increased productivity and higher cropping intensities. Kiramat *et al.* (1986) described that improved production technology has increased the maize products. Shah *et al.* (1996) reported a significant variance difference in all growth and yield parameters. Varieties used were Sultan, UM-2 and YH-401. Maize breeders are now concentrating on the development of broad-based synthetic and composite varieties. Breeding objectives for maize are high yield, early maturity, adaption to specific ecological conditions, tolerance to soil and climatic stresses, high quality and resistant to insect pest and diseases (Samad and Hadi, 1991). Therefore, present study was initiated at Rawalakot to screen four maize hybrids with good yield potential and performance in Punjab and Sarhad provinces of Pakistan. The main aim of the project was to screen the maize genotypes for cultivation under Rawalakot, Azad Kashmir conditions.

Materials and Methods

The research work was conducted at University College of Agriculture, Rawalakot, Research Farm, during 2002. Maize varieties were collected from maize and millet research station Yousufwala District Sahiwal. The experiment was laid-out according to randomized block design (Fisher, 1951). The sub-plot area was 10.62 m² having four rows per hybrid. Rows were kept 75 cm apart and plant to plant distance was maintained at 25 cm. Each variety was replicated four times and from each replication 10 plants were used for data analysis. Data on various parameters were collected and analysed statistically and LSD test was applied to determine significant means separation (Steel and Torrie, 1984).

Table 1: Mean differences against different parameters of maize cultivars

Genotypes	Plant height (cm)	Days to ear-initiation	Number of cobs plant ⁻¹	Number of grains cob ⁻¹	Kernel yield (kg ha ⁻¹)	1000 Kernel weight (g)	Stem diameter (cm)	Days to maturity
Pioneer-hybrid 3012	270b	71d	3a	670b	6355.9a	280a	7.50b	115c
High-corn II	285b	66c	2b	690b	6704.3a	305a	8.75a	120b
Kashmir-gold	315a	61b	2c	810a	7768.3b	335b	7.75b	110a
Sarhad-white	315a	63b	3a	800a	7598.8b	370c	9.75a	110a

Means with different letters differ from each other at 5% level of probability

Results and Discussion

Plant height: All the varieties exhibited a positive response towards environmental conditions. The maximum increase in plant height was shown by variety Sarhad white and Kashmir gold (315 cm) followed by high corn (285 cm) and pioneer hybrid (270 cm) (Table 1). These results are in confirmation with those obtained by Saeed (2000) and Shah *et al.* (1996). Younas . (2002) reported a maximum plant height of 190.85 cm for Pioneer hybrid-3012 and 182.90 cm for hybrid 3130. Similar results were also reported by Hassan (2000).

Days to earing initiation: Days to earing initiation was affected significantly. Pioneer hybrid took 71 days, hybrid corn 66 days, Kashmir gold 61 and sarhad white 63 days to earing initiation which means the agro-climatic conditions are favouring Kashmir gold. and sarhad white followed by others. Similar results have been reported by Ahmad (1987).

Number of cobs plant⁻¹: Statistical analysis of the data showed a significant effect on number of cobs per plant. Three cobs/plant were produced by pioneer hybrid and sarhad white and two cobs/plant by high corn and kashmir.gold each. (Table 1).These results are in accordance with Ibrahim, (1989).

Number of grains cob⁻¹: The data analysed statically revealed a significant difference among genotypes, in which Kashmir gold produced 810 grains cob⁻¹ sarhad white produced 800 grain, followed by high corn with 690 grains and pioneer hybrid with 670 grain cob⁻¹ (Table 1). Similar results were reported by Ahmad, (1987).

Stem diameter: Stem diameter, which directly affect the yield potential of fodder crops was influenced significantly, although the difference among the varieties was minute, ranging from 7-10 cm. More thicker plants were produced by sarhad white as compared to others. Similar observations were reported by Hassan (2000).

Days to maturity: The genotype High corn took maximum 120 days to mature, followed by Pioneer hybrid with 115 days while others took 110 days to mature (Table 1). These results agree with those reported by Aslam *et al.* (1993).

1000 kernel weight: Significant difference was found among all hybrids for 1000 kernel weight. sarhad white produced maximum kernels weight of 370 g followed by kashmir gold with 335 g. The minimum 1000 kernels weight of 280 g was recorded for pioneer hybrid-3012. (Table 1). The heaviest seed could be because of favourable soil and environmental conditions which finally increase the yield. These observations are fully supported by Javed *et al.* (1994).

Kernel yield: Kashmir gold out yielded all other hybrids by producing 7768.36 kg ha⁻¹ as against the lowest per hectare grain yield of 6355.93 kg ha⁻¹ produced by pioneer hybrid-3012 (Table 1). Grain yield is a product of yield associated traits. Debnath and Khan (1990) concluded that plant height, ear height, number of grains cob⁻¹ and 1000 kernel weight have positive contribution to grain yield. These results are also in agreement with those of Aslam *et al.* (1993).

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