

Sowing Maize on Optimum Time in Season is Unavoidable for Higher Yield



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Abstract

Optimum sowing time along with suitable maize cultivar for an area guarantees higher yield. To study maize performance for different sowing dates in Peshawar's climate, different researches were analyzed. Data revealed that sowing dates significantly affected crop phenology (days to emergence, teaselling, slicing, and maturity), crop growth (leaf area, leaf area index, plant height and ear height), yield contributing traits (ear length, rows per year, grains per year, ears per plant, shelling percentage, and thousand grains weight) which ultimately affects both biomass and grain yield. Early sowing of maize i.e. mid-June resulted in better yield and yield traits. However delayed sowing from optimum time significantly decreased yield. In light of the present study, one can conclude that sowing of maize in June returns higher production with better traits. Additionally, maize hybrid SB-92K97 and SB-909 are relatively better option to plant in the region. The study suggested that maize has to be planted as early as possible (i.e. in June) right after the wheat and/or Be seem harvesting. Thereafter, any unavoidable delay in sowing time will decrease grain production by adverse effects on yield traits. Nonetheless, a good variety selection of maize either hybrid or OPV (open pollinated variety) can minimize yield losses but cannot substitute yield reduction by subsequent delay in sowing made after July 15 in the region by any other means.

Keywords: Hybrids; Sowing dates; Phenology; Yield components; Yield

Abbreviations: KP: Khyber Pakhtunkhwa; GEI: Genotype and Environment Interactions

Introduction

Maize (*Zea mays L*) is an important species of the family Poaceae. Being tropical region crop, it is grown on a large area in Pakistan every year in summer. In 2014-2015, it was cultivated on about 1142.5 thousand hectares that produced 4936.8 thousand tons grains with average yield of 4321kg ha⁻¹ [1]. In Khyber Pakhtunkhwa (KP), it was grown on an area of 463 thousand hectares, which produced 909 thousand grains with mean yield of 1965kg ha⁻¹. In KP, maize is grown for dual-purpose i.e. grain for food and stalk for fodder. Agro-environment of KP permits its cultivation in spring as well as summer as main Sharif season crop. Maize is a rich source of income for many poor farmers in developing countries [2,3] documented that changing rainfall pattern with shifting from winter to spring and summer with increasing temperature, maize cultivation and production has increased in Pakistan. They also observed increase in monsoon rainfall which may favours summer crops (e.g. Maize) growth and development particularly in KP. It is expected that in near future, total rainfall seems to be increases during summer. However, its distribution is more important than the amount for crops in cultivation for performance based on the crop life cycle and use efficiency of resources consumed net per unit area by the crop variety.

Genotype and environment interactions (GEI) are the primary factor in determining yield potential of a crop for an area. Optimum sowing time and appropriate variety selection, in addition to soil health, temperature and irrigation facility are the major factors determining maize productivity in an area [4]. Planting at right time is very important for optimum production. With delay in sowing date of crop, significant decrease in yield is obvious due to limited growth period in season [5]. Higher yield is attributed to appropriate sowing time for appropriate variety selection for the area in addition to adapting recommended management practices during crop growth and development [6]. Research work of [7] highlighted that delay in sowing time of maize varieties resulted in lower yield. For best utilization of soil moisture, available nutrients and taking advantage of solar energy, optimum sowing time for a variety is critical factor of production for a cropping system in prevailing climate [8]. With identification of a high yielding cultivar, suited well for sowing time in a climate, yield of existing major crops can be improved with better management [9]. Planting date has been reported critical to cause significant losses in maize production due to extreme variations in temperatures during growth period from sowing to harvesting with mild variation from optimum

at a thesis stage. The recent climatic changes in weather during crop growth refers relatively moist and cooler climate in KP for summer crops i.e. maize. Hybrids cultivation in cropping system has increased, which took more duration as compare to OPV. The adjustment of a suitable hybrid for maximum production is subjected to focus on planting time effect for the area. It is a challenge faced by growers in the scenario of changing climate to find a suitable variety that planted at a suitable time for maximum yield [10]. Selection of a suitable high yielding variety is a key factor for highest net return in area under changing climate. To change sowing time has diversified effect on growth and developmental stages of varieties that ultimately perform to sustain in a cropping system. Maize being a summer season crop, if delayed in sowing due to an eventuality might limits its productivity by in time completing its physiological phases of development in an area e.g. higher altitude where days become cooler and shorter in September-October when crop is ready to mature that results in yield reduction [11]. Despite of increase in use of fertilizer application and improved variety, maize crop in Pakistan and KP showed very low yield with yield gap of more than 100%. Climate of the area indeed is fit well for growth and development of maize [12,13]. The objective of this study is to determine the effect of early or delay in sowing time in season on maize performance.

Conclusion

It can be concluded from the present study that sowing of maize hybrid SB-909 or SB-92K97 early in the season i.e. in June gave maximum biomass and grain yield and delay in sowing from June onwards decreased yield but greater yield loss was observed when sowing was delayed from mid -July onwards.

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