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Boquet Ears in Maize

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Abstract

Maize hybrids have developed more than one ear at a single node on farmers' fields of Jayavaram village, Siricilla district of Telangana during *kharif,* 2019. This trait has been expressed in different ways. In the most extreme cases, up to 6 to 8 ears have occurred at a single node, we can call it as 'bouquets'. Bouquet ears are often formed at the node below where the primary ear arises. This indicated that stress at V5 or V6 (*i.e.,* nutritional deficiency, water logging conditions) stopped normal development of the primary ear, thereby breaking apical dominance. Breaking of apical dominance, may contribute to multiple ears developing at the same node or its due to problem in pollen shedding from tassels, (especially in *kharif* season due to continuous rains) male inflorescence at the time of flowering or increase in Anthesis Silking Interval. It causes a drastic reduction in grain yield and quality which ultimately leads to lower profitability.

Introduction

Maize (*Zea mays* L.) is one of the most versatile emerging crops having wider adaptability under varied agro-climatic conditions. Globally, maize is known as queen of cereals because it has the highest genetic yield potential among the cereals. In India, maize is the third most important food crop after rice and wheat. In India, maize is cultivated throughout the year in most of states of the country for various purposes including grain, feed, fodder, green cobs, sweet corn, baby corn, pop corn and industrial products. It is cultivated in an area of 8.7 mha (2019-20) mainly during *Kharif* season which covers 80% area and the yields were low because of uneven rainfall, incidence of diseases and insects-pests as well as of weeds.

Basics of Ear and Shank Formation

The number of potential ear shoots is determined around V5. Apical dominance, a strong characteristic in corn, is driven by plant hormones and causes the plant to allocate resources to a primary ear. Hence, even though several potential ear shoots may have developed at V5, only one often produces a harvestable ear. Bouquet ears are often at the node below where the primary ear would be. This indicates that stress at V6 or V7 likely stopped normal development of the primary ear, thereby breaking apical dominance (Lejeune and Bernier, 1996). Hormonal imbalance causes the plant to allocate resources to the secondary ear shoot, may contribute to multiple ears developing at the secondary node. Shanks are similar to stalks. Husks are attached at a node on the shank, as leaf sheaths are attached at a node on the stalk. Ears may develop at various nodes on the stalk, and in some cases, ears may develop at nodes on the shank. It is difficult to determine why twin and bouquet ears

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can develop from the same shank, or from separate shanks at the same node, as information on the timing of shank development relative to growth stage is limited.

Reasons for Multiple Ears

Maize is highly responsive to better agronomic management practices and for obtaining high yields in *kharif* season, it is essential to follow the entire recommended package of practices at the appropriate time. As the fertilizer dose applied by the farmers was below the recommended dose during the critical growth stages, and also maize crop is very sensitive to water logging conditions, due to continuous rainfall water logging conditions prevailed at knee height to flowering stage, and no measures against weed control by farmers resulted in poor uptake of the sub optimal dose of applied nutrients. Poor agronomic management of crop, nutritional deficiency and water logging conditions at critical stages of the crop (V5-V7, *i.e.,* ear formation determination stage), continuous and high rain fall during flowering stage resulted in formation of Bouquet ears.

Figure 1: Bouquet Ears in Maize

Conclusion

It is highly unsure that field management, genetic or environmental factor induced the multiple-ear trait expression. This expression occured on several hybrids during our observation. Dr. Nielsen (2006), and Roger W. Elmore and Lori J. Abendroth (2006) also reported that the cause of the multiple ears is not definitively known. Yet in instances where a 'bouquet' of ears occurred, we expect a greater yield loss because in those cases, often no kernels were produced on the ears. Therefore, the differential expression of this multiple ear trait will cause substantially different yield responses.

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