CMS environmental stability in Maize

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Abstract

Cytoplasmic Male Sterility (known hereafter as CMS) has been a major component of hybrid seed production for seven decades. Companies are searching for ways to reduce spending and increase efficiency, which can be achieved with the use of CMS lines within maize hybrid production. While generating and increasing CMS female parent seed to be used in hybrid production, CMS S & C types have been observed to break (become fertile). Breakage of CMS lines raises significant concerns when generating hybrids, these concerns include self-pollination and reduction in purity of commercial seed, which would result in significant reduction in sales & operation efficiency. This study is focused on characterizing and determining growing environments that enable use of CMS female parents without the concern of sterile breaking or being able to identify through phenotypic evaluation, signs that express breakage could occur. This will allow commercial seed companies to utilize CMS seed effectively within all growing environments. If conditions are present for breakage, this study could provide diagnosis with solutions through phenotypic or genetic signs to be able to accommodate operations to ensure quality products can be produced.