ABSTRACT

THE ESTIMATION OF GENETIC COMPONENTS, COMBINING ABILITY, AND SEED SEGREGATION ON BICOLOR SWEET CORN

By

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Sweet corn (*Zea mays saccharata* [Sturt.] Bailey) is a horticulture commodity favored by population. The progeny analysis is commonly related with the ability of parents in a cross known as combining ability. The combining ability is the ability of genotypes to inherit characters of interest to their progenies. The evaluation of combining ability is a mean to estimate the capacity of both parental inbreds to inherit their characters of interest to their F1 hybrid progenies.

This study intended to: (1) asses the presence of genetic variance and heritability for characters of interest to be evaluated; (2) evaluate the combining ability of parental inbreds to their open-pollinated bicolor progeny; and (3) obtain the bicolor sweet corn having shrunken seeds on its ears.

This study was accomplished in a Randomized Complete-Block Design (RCBD) with three replications. Data was analyzed for the variances to estimate for its mean squares and expected means squares to be utilized to estimate genetic variance and heritability. Genetic variance ($\sigma^2 g$) and broad-sense heritability (h^2_{BS}) were calculated following mathematical model developed by Hallauer and Miranda. The combining ability analysis was done using box plot analysis.

The seed segregation of true-type sweet corn was calculated in a way of comparing the number of shrunken-seeds with the total number of seeds in the ear.

Base on the result of this study, the differences among cultivars were significant for the characters of male-inflorencence spike number, ear diameter, ear length, and sugar content.

The characters of the plant height, ear position, leaf number, and seed-row number were not different. The values of genetic variation and heritability were greater than zero (> 1 S.E.) for the characters of ear position, male-inflorencence spike number, ear length, and sugar content. The values of genetic variation and heritability were not different from zero (< 1 S.E.) for the characters of plant height, leaf number, ear diameter, and seed-row number. The general combining ability were proven on the characters of plant height, ear position, leaf number, male-inflorencence spike number, ear length, and sugar content. The specific combining ability was proven on the characters of ear diameter and seed-row number. All of 15 sweet corn ears under study were bicolor sweet corn. The sweet taste of sweet corn was determined by the shrunkeness of the sweet-corn seeds. Based on the shrunken-seed number, it was proven that almost all of the observed samples inherited the character of sweetness.