

ABSTRACT

QUANTITATIVE GENETIC ANALYSIS FOR VEGETATIVE AND GENERATIVE TRAITS ON THREE CULTIVARS OF SWEET CORN

By

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Sweet corn is one of the horticulture commodities of high economic value. Markets require a great volume of the sweet corn. Plant breeders conduct selection on the sweet corn plants to improve their vegetative and generative traits. The selection in a breeding program results in a better qualitative and quantitative properties. Analysis of variance (anova) determines the genetic variances inherited from the parents. The amount of genetic variance of a trait in a population affects the magnitude of heritability in the environment where it grows. The greater the value of heritability, the greater the probability of the progenies to inherit these properties, and the smaller the effects of the environment to hamper the inheritance.

The study aimed to determine: (1) the vegetative and generative traits in three sweet corn cultivars and to compare the traits with the commercial standard; (2) the genetic variances and broad-sense heritabilities of the cultivars; and (3) the

diallel-epistatic segregation of the seeds following 9 Round: 7 wrinkle and 12 Round: 4 wrinkle.

The study employed a non-factorial randomized complete-block design with three replications. The progeny lines of LASS Round-Yellow, LASS wrinkle-Yellow, and LAW Round-white cultivars were evaluated. The anova determined differences among traits and the Tukey's HSD 5 % was used to rank the lines. Furthermore the mean squares of the anova calculated for their expected values. The expected values calculated for genetic variance (σ^2g), broad-sense heritability (h^2_{BS}), and genetic coefficient of variability (CVg) values. A test of goodness of fit χ^2 established the segregation of seed shape and color.

The results showed that there were no differences among the LASS Round-Yellow, LASS wrinkle-Yellow, and LAW Round-white cultivars for the vegetative and generative traits. Therefore the three cultivars were at the same rank. The values of the genetic variance (σ^2g) and the broad-sense heritability (h^2_{BS}) were not existing, or were not different from zero. The LASS Round-yellow cultivar fitted a Mendelian segregation ratio of the seeds of 12 Round: 4 wrinkle. The LASS wrinkle-Yellow cultivar did not segregate either for the seed shape or seed color. This cultivar was homozygous for the seed shape and color, and produced wrinkle seeds true type for a sweet corn.