

ABSTRACT

THE ESTIMATION OF GENETIC COMPONENTS ON PARENTAL POPULATION AND HETEROSIS ANALYSIS ON YELLOW-SHRUNKEN-SEED OF SWEET MAIZE

By

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The plant breeding is closely related to selection process. The genetic component (genetic variance and heritability) is required for effective and efficient selection. The genetic variance determines the selection success, while heritability infers the advance of superior character inheritance from parental to descent. Besides, selection is conducted corresponding to selection characteristics based on consumer's favor for the seed commercialization. The crossing results from selected cultivars are plant seed with better profile because of heterosis effect.

This research intended to: (1) identify the difference of the vegetative and generative characters among the parental cultivars of sweet maize, as compared to a commercial standard; (2) observe the genetic variance and broad-sense heritability on three parental cultivars of sweet maize; and (3) estimate the presence of heterosis on Yellow-shrunken-seed progeny.

The research was accomplished at the Politeknik Negeri Lampung Research Station in September 2009 to January 2010. The research used Randomized Complete-Block Design (RCBD) non factorial with three replications. Parental cultivars as treatment were consisting of (1) LASS bicolor; (2) LASS Yellow-shrunken; and (3) LAS Yellow-shrunken. Data taken for the vegetative characters were plant height, ear position, and leaf number. Data for generative characters were tassel number, ear diameter, seed row number, ear length, and sucrose content. Data were analyzed for variances, and parental cultivars were ranked using Tukey HSD 5 %. Genetic variability (σ^2_g), broad-sense heritability (h^2_{BS}), and genetic coefficient of variance (CVg) were analyzed by using a mathematical model developed by Hallauer and Miranda. The heterosis was estimated by using a box plot analysis.

The results show that (1) parental cultivars have no differences in variables such as plant height, ear position, leaf number, tassel number, ear diameter, seed row number, ear length, and sucrose content. The tassel number, ear length, and sucrose content have complied with commercial standards; (2) the genetic variance and broad-sense heritability equals to zero in variables of plant height, ear position, leaf number, tassel number, ear diameter, seed row number, ear length, and sucrose content; and (3) high parent heterosis is fulfilled in variables such as leaf number, tassel number, ear diameter, seed row number, ear length, and sucrose content; the ear length and sucrose content in descent have complied with commercial standards.