

INSTITUTO FITOTECNICO DE SANTA CATALINA
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1. Studies on the resistance of corn to Helminthosporium maydis.

During the last few years, a project has been underway with the purpose of finding resistant genes to Helminthosporium maydis Nisik and Miyake in pure corn lines, using a collection of 350 lines (S8-S34) and one made up of lines selected from populations derived from various Latin American countries.

On account of such studies, this Institute now possesses a number of lines resistant or very resistant to H. maydis. Some of them have already been distributed among private and official Institutions devoted to corn plant breeding projects.

At present our research work attempts to find a relationship among T cytoplasm and some other cytoplasm with various genotypes resistant to Helminthosporium maydis Nisik and Miyake.

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2. Euchlaena perennis Hitch. X Zea mays L.

Studies on Euchlaena perennis Hitch. (2 or 4N = 40) X Zea mays L. (2n = 20) were carried out by R. A. Emerson and G. W. Beadle in 1930 (Amer. Nat. LXIV: 190-192) and by D. S. Shaver in 1963 (Maize News Letter 37:8-11). In 1964, we carried out crosses between Euchlaena perennis Hitch. and Zea mays L. getting a perennial F₁ with very strong plants, with abundant tillers and with inflorescences similar to Euchlaena. A cytological study of the F₁ plants showed in diakinesis trivalents, bivalents, and monovalents; these characteristics agree with Emerson's and Beadle's studies. Only one F₂ kernel was formed in every 100 flowers.

The F₂ plants showed a segregation of 75% annual plants and 25% biennials or perennials, with a pollen fertility of about 0-50% in 85% of all plants and with a fertility of about 85-95% in 15% of all plants.

After six generations of mass and genealogical selection, we got a perennial population with 80% fertility. This population has some

characteristics of forage plants and they may be added to maize (by means of chromosomes made up structurally of segments of *Euchlaena* and *Zea*): (1) prolificness, (2) endurance to drought due to their strongly developed radical system and (3) heterosis factors from F_1 vigor.

At the present time, the cytogenetics of inbred lines from this population is being studied.

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1. Behavior of inbred lines in Texas cytoplasm.

The behavior of 375 corn lines (selfed S8-S34) was studied in relation to cytoplasmic androsterility conditioned by Texas cytoplasm. This work was carried out at two different localities: Salto (Prov. Buenos Aires) for visual observations, and Llavallol (Prov. Buenos Aires) for visual and microscopic observations.

As a result of this study we made the following conclusions: 26 (6.9%) of the inbred lines showed 100% restoration in both localities; 70 (18.6%) of the lines showed no restoration in both localities; and 279 (74%) of the inbred lines showed an undetermined condition.

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