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 (68-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 cytoplasms with various genotypes resistant to *Helminthosporium maydis* Nisik and Miyake.

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Studies on *Euchlaena perennis* Hitch. (2 or 4N = 40) × *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 F₁ 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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