

Seeing that in each case all offspring of the cross $[\underline{ms}_x]A158^n \times [\underline{ms}_2]Rf^2rf^2_rf^1$ were fertile we needn't concern ourselves about Rf^1 . It appears then that each sterile tested has behaved as $[\underline{ms}_2]$.

Before concluding that each $[\underline{ms}]$ was $[\underline{ms}_2]$, let us consider other alternatives. Since the genetic material from A158 did not bring about the fertility, the chromogene involved must have been either Rf^2 or another gene so closely linked with Rf^2 that out of ninety-nine progeny observed no cross-overs occurred.

A further check was made. It is known that the time of Rf^2 gene action is shortly after the quartet is formed. This means that when it is with $[\underline{ms}_2]$, pollen grains carrying rf^2 abort (see M. N. L. 33: 18-19). Therefore, if the fertile offspring of the cross $[\underline{ms}_x]A158^n \times [\underline{ms}_2]Rf^2rf^2_rf^1$ A158⁵ had the $[\underline{ms}_2]$ plasmatype and the restorer involved was Rf^2 , fifty percent of the pollen of these plants would be expected to abort. All of the plants were checked with a hand microscope (60X) and found to have about fifty percent aborted pollen. Differences (as shown in the above table) could have been due to environmental conditions, since the inbred A158 may vary somewhat from day to day. This means that if another gene, closely linked with Rf^2 , was responsible for the restoration its time of action would also have had to be shortly after quartet formation. Although this may seem unreasonable, more plants resulting from the same crosses will be grown this spring in an effort to observe any cross-overs.

Even if Rf^2 is responsible for the restoration it cannot be absolutely concluded that all these plasmatypes are identical with $[\underline{ms}_2]$ (though they could justifiably be called $[\underline{ms}_2]$), for the plasmagenes can only be differentiated in terms of the restoring genes. It may be possible for one chromogene to compensate for more than one type of cytoplasmic "error." This should be borne in mind when considering that Khoo and Stinson (M. N. L. 33: 22) found chromatographic differences between these same types of cytoplasmic male sterility.

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1. Inhibition of geotropism in corn seedling shoots by gamma radiation.

US-13 yellow dent hybrid seedlings four days old (1-3 cm. high) were irradiated in the coleoptile stage or in other experiments were irradiated as dry seed. Fourteen doses from 20 to 640 Kr were administered at ca. 4 Kr per minute to seedlings within the relatively uniform flux center of a hollow cylinder type cobalt-60 irradiator. All plants were handled in individual one ounce square glass bottles containing vermiculite. One hour after irradiation they were "presented" to gravity by turning the bottles on their sides. Time lapse photographs were taken of the geotropic response of the shoots every twenty minutes for forty-eight hours. Geotropic bending and growth were measured on the projected film images. Radiation inhibited both geotropism and growth. Statistical analysis revealed that the primary component in the relation between dose and inhibition of geotropism was linear with significant higher order effects.

Irradiation of dry corn seed with subsequent germination and determination of geotropic response and growth gave a different picture. The inhibiting effect of radiation on geotropism increased to 120 Kr, then decreased, so that at 360 Kr the seedlings responded geotropically almost as well as unirradiated controls. A similar but much less pronounced effect on growth was obtained as had been reported

previously for corn seed.

Preliminary experiments attempting to reverse 480 Kr inhibition of geotropism and growth with indoleacetic acid and naphthaleneacetic acid were unsuccessful.

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2. Physiological study of lazy.

The Coop stock of la, which grew very poorly in Florida, was outcrossed to Florida adapted lines and reisolated. Also, it was separated from su. The breaking strength of lazy and normal sib plant stalks was determined. The weights required to break a six inch span of basal stalk were variable, but the means were not very different. In this stock at least, stalk weakness does not seem to be the basis for the ultimate prostrate growth habit. Although it had been reported by Shafer that lazy plants became ageotropic at an age of ca. 4-7 days, according to temperature, no reference was made to the coleoptile. It was found that shoots of lazy seedlings in the coleoptile stage are normally geotropic, but after breaking through the coleoptile the leaves become ageotropic.

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3. The red pigment formed in corn seedling extracts with anthranilic acid.

The red pigment formed in breis of corn seedling leaves (News Letter 28: 22, 1954) has been further studied. Anthranilic acid disappears as the red material is formed. Paper chromatography and other evidence indicate that the substance in leaf extracts is yellow; crystalline; soluble in ether, acetone, and water but not ligroin; is slightly acidic; gives Craven's test for quinone; and the chromatographed 2, 4-dinitro-phenylhydrazone color suggests a benzoquinone.

The red pigment formed from anthranilic acid is acidic, has no free diazotizable amine, and is decolorized by bisulfite. Tentatively it is suggested that the material which combines with anthranilic acid to form the red pigment may be a partially substituted benzoquinone which would make the red pigment an aminoquinone, specifically an anthranilylquinone. It may be that material, which is almost absent in corn embryos and older plants but which is abundant in young plants, has a function in electron transport like Coenzyme Q, or conceivably is a precursor of Coenzyme Q.

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1. A method for keeping maize plants alive in the tasseling stage after removal from the nursery.

A simple method was developed for transporting and keeping corn plants alive for demonstrations. A mature corn plant undergoing anthesis was dug from the nursery with a shovel. The roots, in a clump