In addition there are two sweet corn varieties Black Mexican (ACR Pr) and Catawba Blue (ACR pr, contrary to name). Seed is available of all these varieties.

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1. Role of cyclic hydroxamic acid on monogenic resistance to Helminthosporium turcicum in maize.

Cyclic hydroxamic acids in maize were first reported in 1959, but their biological significance has yet to be clearly established. The production of the fungitoxic aglycone 2,4-dihydroxy-7-methoxy-1,4-benzoxazine-3-one from its glucoside upon cellular disruption has been implicated in resistance to several pathogens.

To observe their effects on monogenic resistance, we crossed a genotype deficient in these compounds (hthtbxbx) with the normal resistant genotype (HtHtBxBx). The deficient genotype is an S_1 line, designated no. 59C32-1, obtained from R. H. Hamilton at Penn State. Deficient seeds were detected by crushing a root tip on filter paper impregnated with M/10 $FeCl_3$. A blue colored chelate at the oxidized peptide bond of the hydroxamic acids is formed in normal seeds.

Seedlings are inoculated at the three leaf stage and incubated for 18 hours at 68°F and 100% humidity. The degree of infection is determined by measuring the total area of the fourth leaf and the area of the leaf covered with lesions. Areas are measured with the use of a transparent grid containing 100 squares to the square inch.

Significant effects on the susceptibility of the HtHt and Htht genotypes are presently being observed in the F_3. Lesions on resistant deficient (Ht-bxbx) seedlings enlarge rapidly and have a general chlorosis. Resistant normal lesions (HtHtBxBx) generally do not enlarge

and remain as chlorotic spots. It appears that the fungitoxic compounds modified by the Bx gene act in containing the spread of the fungus.

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1. A polyphenol oxidase oxidizable flavonoid difference in corn silks.

Silks from certain stocks turn a brown color when ground up and allowed to stand a few minutes, while with other stocks the ground silks remain yellow-green (i.e. no change in color occurs). Furthermore, differences in ground up silk color can be detected on the plant by cutting back the silks and observing the cut ends an hour later. If the cut ends turn brown, then the silks turn brown upon grinding. Likewise if the cut ends don't change color, then the ground silks don't change color. For convenience, the phenotype shown when cut silks ends and ground up silks turn brown is designated "brown," while that where no change in color of cut silks ends or ground up silks is observed is called "colorless." The inbred line NC232 has the brown phenotype while NC236 has the colorless. The F_1 between NC232 and NC236 has the brown phenotype. A testcross gave 37 brown and 44 colorless types. This fits a 1:1 ratio with a probability of .4-.5. These results indicate a monohybrid segregation with the brown phenotype being dominant to the colorless.

Analysis of the brown phenotype has indicated that the brown color in ground silks is due to the oxidation of a polyphenolic compound and the subsequent polymerization of the resulting quinones. Polyphenol oxidase is the enzyme responsible for the oxidation of the polyphenol. The browning reaction can be inhibited by DIECA (sodium diethyldithiocarbonate), a selective inhibitor of polyphenol oxidase. The brown