

2. Effect of cyclic hydroxamates on germinating *H. turcicum* spores.

In maize, a single gene, Ht, conditions chlorotic lesion resistance to Northern corn leaf blight, the causal agent of which is Helminthosporium turcicum Pass. The Bx gene mediates the production of cyclic hydroxamic acids and related compounds which have been implicated recently in the resistance mechanism of maize, wheat and rye to both insects and fungi.

A bioassay test was performed to determine the fungitoxicity of cyclic hydroxamates on germinating spores of H. turcicum. DIMBOA (2,4-dihydroxy-7-methoxy-1,4-benzoxazine-3-one) was isolated and purified to be used in the test which utilized solution ranging from 1-10 p.p.m.

Spore suspensions were prepared from cultures which were cut into small blocks and placed in a flask containing distilled water. The flask was shaken gently and the spore suspension filtered through glass wool. Fresh spores were added to drops of the test solution and placed on hanging drop microslides. The spores were incubated at room temperature overnight, killed and stained with IKI, and the percentage germination determined.

The results indicated that inhibition is significant at all concentrations, and is nearly complete above 6 p.p.m. Spores which germinated had significantly shorter germ tubes than the control at all concentrations. DIMBOA may therefore act in killing spores at the point of penetration and in slowing down the spread of the mycelium.

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3. Comparison of intact and detached corn leaves in bioassay tests with *Helminthosporium turcicum*.

Diffusates from corn leaf lesions were tested for their effects on spore germination of H. turcicum. Several genotypes were tested, including monogenic resistant (HtHt) and susceptible (htht) plus various combinations with (BxBx) and (bxbx) (MNL 1970). In the HtHt genotype, phytoalexin was apparently produced earlier in the intact than in the detached leaf. Diffusates from the intact leaf decreased both the rate

and percent of spore germination within 2-3 days, but 4-5 days were required from the detached leaf. No effects were observed with diffusates from susceptible (htht) leaves or from either resistant or susceptible control leaves (control leaves sprayed with water only).

Diffusates from HtHtBxBx leaves were more inhibitory on spore germination than diffusates from HtHtbxbx leaves. The diffusates from hthtBxBx were slightly more inhibitory than diffusates from hthtbxbx, and the former delayed the growth of germinated spores. Diffusates from homozygous resistant leaves (HtHtBxBx) inhibited spore germination much more than diffusates from the heterozygous genotype (HtHtBxBx).

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1. An amino acid accumulating mutant from USDA P.I. 194047.

A pale-green maize mutant has been isolated from USDA P.I. 194047 and was first reported by Bell (MNL 36:73, 1962). This is a viable mutant which displays pale-green leaves for the entire life of the plant. Growth is somewhat stunted and seed set is fair to poor. Outcrosses of the mutant were made with several inbred lines, and  $F_2$  populations produced 592 normal green and 200 pale-green plants, indicating the involvement of a single allelic pair of genes displaying simple dominance. Crosses were also made with Dr. E. G. Anderson's waxy-marked translocation series involving all chromosomes. All  $F_2$  populations from these crosses showed normal 3:1 segregations; however, chromosomes 7, 9 and 10 cannot be eliminated as possible locations for this mutant gene. The gene has tentatively been designated pg<sub>13</sub>.

A segregating population involving the mutant trait as well as a normal green line derived from the inbred Oh51A were grown in a Percival growth chamber model PGC-78 at 27± 3°C under approximately 1000 ftc. of illumination on a 16 hour photoperiod. The plants were watered with tap