

**Evaluating Low Levels of Tachigaren on Minimum Build-Up-Treated Sugar Beet Seed for Protection Against *Aphanomyces cochlioides*.** R. M. Harveson, L. Hubbell, C. E. Windels, J. A. Smith, J. R. Brantner, J. F. Giles, and N. R. Cattanach.

The objective of this study was to evaluate low levels of Tachigaren (hymexazol) as possible standard treatments on sugar beets under low to moderate levels of disease pressure, caused by *A. cochlioides*. The study was conducted for 3 years (2001-2003), at 12 separate sites in Michigan, Nebraska, and North Dakota. Treatments consisted of 1) Apron/Thiram incorporated into minimum build-up coatings with Tachigaren (20g and 30g), 2) Tachigaren applied at 45 g in a standard seed pellet, and 3) Apron/Thiram-treated controls. The same treatments were additionally tested under optimum conditions in the greenhouse in field soils naturally infested with varying concentrations of *A. cochlioides*. Field results varied, but several locations showed higher rates of Tachigaren with minimum build-up treatments (30g) caused reduced seedling emergence. However, few significant differences were observed from yield parameters, suggesting minimal damage to crop at the end of the season. Greenhouse results indicated that using low rates of Tachigaren with minimum build-up coatings exhibited more potential for use in fields with low-moderate levels of *A. cochlioides*. These same treatments were not consistent in soils with high disease potential.

This same mutation has been shown to confer sensitivity to N-phenylcarbamates (NPC). When our *C. beticola* isolates were tested for sensitivity to the NPC fungicide diatholone (DTC), benzimidazole-tolant isolates proved sensitive to the NPC, while benzimidazole-sensitive isolates showed little or no sensitivity to DTC. Ninety-six *C. beticola* isolates were collected in the central High Plains region of the United States in 2004. These isolates were tested for their response to benzimidazoles and DTC and forty-three (45%) were highly sensitive to MB (100% growth inhibition at 1 ppm) and tolerant to DTC. Fifty-three (52%) were highly resistant to MB and did not grow on DTC at 2 ppm (Figure 1). The growth on MB and DTC had a correlation coefficient of 0.971. PCR primers for the benzimidazole-tolant and benzimidazole-sensitive sequences are being developed to investigate use in a more rapid method for detection of the mutation. The negative cross resistance and knowledge of the mutation in the beta-tubulin gene may be useful to rapidly screen for shifts in the benzimidazole-tolant population.

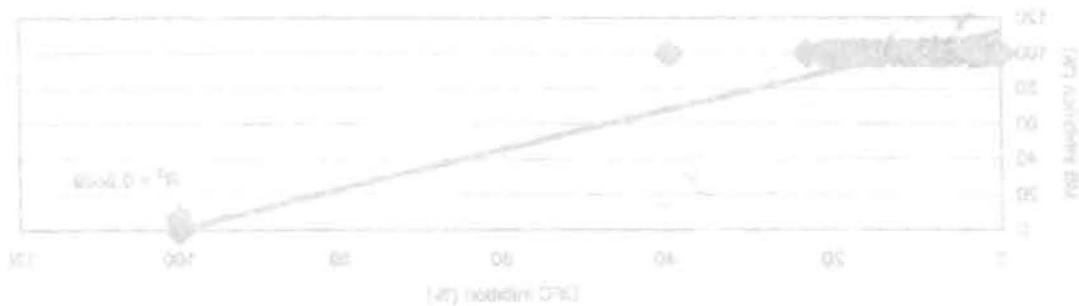


Figure 1. Percent growth inhibition for *Crocodylus beticola* field isolates from 2004 on diatholone (DTC) versus betaine (MB).