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Using the Bt-CR Transgene on the Farm

Joe Lauer and Eileen Cullen, *Corn Agronomist and Entomologist*

Corn rootworm is the most serious insect pest complex in the major corn producing regions of the north central U.S. and Canada. Crop rotation with soybean is estimated to be used on 80% of the north central U.S. acreage and is the most common pest management practice for corn rootworm control. This control strategy can no longer be used reliably on many acres of southeastern Wisconsin without beetle scouting date from the previous year.

A variant of Western corn rootworm (*Diabrotica virgifera virgifera* LeConte) lays eggs in soybean fields. Eggs are ready to hatch next year when planted to corn. Variant western corn rootworm damage to first year corn was first observed in Illinois after soybean during 1993 and wheat in 2002. A variant of Northern corn rootworm (*Diabrotica barberi* Smith and Lawrence biotype) first observed in Minnesota exhibits extended diapause where eggs remain in the soil an extra year and hatching is delayed until corn is planted again.

Recently corn hybrids with Bt-CR (Mon863) transgenes have become available to farmers. A three-year study tested Bt-CR hybrids and their normal isolines with and without use of corn rootworm insecticides (Figure 1). As corn rootworm damage in the normal isoline increased, using either Bt-CR hybrids or insecticide was important. At the highest corn rootworm pressure, Bt-CR hybrids performed best when insecticide was also applied.

Controlling corn rootworm can be achieved through numerous methods. Early reports indicate that *transgenic hybrids* provide equivalent control to chemical methods. Numerous products are labeled for *chemical control*. No hybrids are resistant, but some *tolerant hybrids* have the ability to outgrow rootworm damage and regenerate roots better than other hybrids. *Crop rotation* has been a proven method

of control but is beginning to break down in some areas. Good weed control is needed to prevent corn rootworm adult attraction to weed flowers. Some *management practices* will aid control such as planting late to starve larvae, but may not be practical due to yield penalty. Some *natural control* can be achieved through ground beetles and predaceous mites that feed on corn rootworm eggs, larvae and pupae

Performance of Bt-CR hybrids indicate similar control to chemical methods. Bt-CR hybrids reduces reliance on insecticide applications and have consistent performance under variable field conditions. Bt-CR have an excellent safety profile especially for human health and non-target organisms. Laboratory and field studies demonstrate high level of control. One generation of selection occurs per year. Bt-CR hybrids are not active against adult rootworm or other root / seed feeding insects. No acute toxicity to adult corn rootworm is observed.

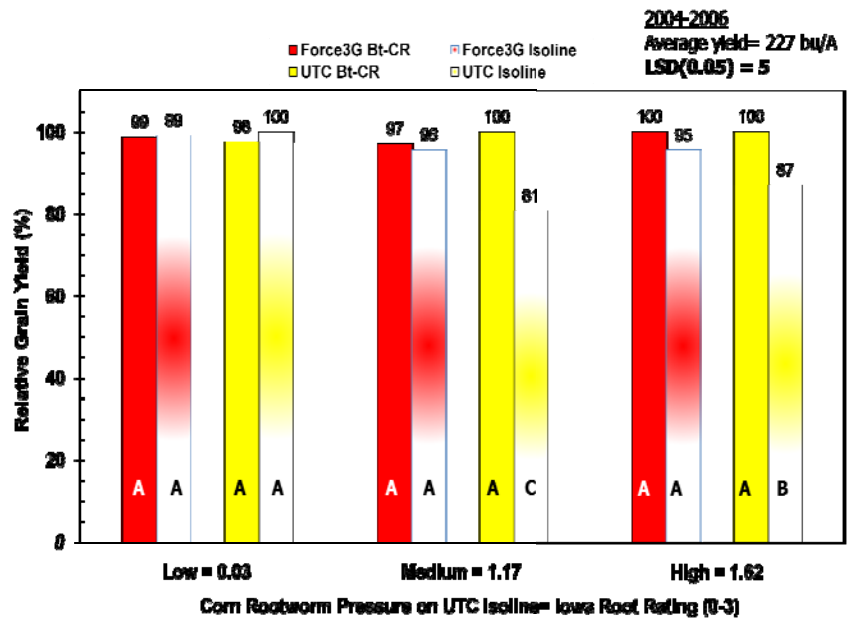


Figure 1. Relative grain yield response of Bt-CR (Mon863) transgenic corn hybrids compared to their isolines with and without insecticide when grown in environments varying for corn rootworm damage to the untreated isoline.