

Biological Control of Annual Bluegrass  
With *Xanthomonas campestris*

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*Xanthomonas campestris* is a bacterium under development as a potential bioherbicide for annual bluegrass control in turf. Studies are currently underway at the Hancock Turfgrass Research Center to evaluate the efficacy of *X. campestris* for annual bluegrass control.

Flats of *Poa annua* var. *annua* and *P. annua* var. *reptans* were established in the greenhouse and transplanted to the field in May, 1991. Treatments were biweekly or monthly inoculations of  $10^9$  colony forming units (cfu) /ml *X. campestris* and a tetracycline treated control. Inoculations were initiated three weeks after transplanting to the field. Var. *annua* was more susceptible to bacterial treatments than var. *reptans* with both monthly and biweekly treatments being completely dead six weeks after initial treatment (WAT). Var. *reptans* declined steadily but more slowly than var. *annua* and although being severely injured (85% of plants dead), inoculated plots contained many healthy plants 8 WAT.

Flats and field plots established and inoculated in 1990 demonstrate the effects of *X. campestris* one year after treatment. Plots were established by seeding with *Poa annua* var. *annua* or a mixture of *Poa annua* var. *annua* and 'Penncross' bentgrass (80:20 by seed number). Inoculation with *X. campestris* completely eliminated *Poa annua* var. *annua* from both the monoculture and the annual bluegrass/bentgrass mixture and overseeding with bentgrass resulted in the transition to a pure bentgrass stand by spring 1991.

A spread study is being conducted to evaluate the distance of bacterial spread from an area inoculated with *X. campestris*. Treatments include an uninoculated control, tetracycline treated control and passive and active spread by the mower. Inoculations are conducted biweekly with  $10^9$  cfu *X. campestris* and are mowed immediately. Some symptoms have been observed in the inoculated areas and in the uninoculated active spread area but biocontrol activity is not severe.

Additional studies are also being conducted at other locations at the Hancock Turfgrass Research Center:

1. To evaluate the interaction between the chemicals Embark, Prograss, PP333 and Cutless and *X. campestris* and their potential for enhancing *X. campestris* control of *Poa annua*.
2. To evaluate *X. campestris* control of *Poa annua* on greens height turf.
3. To evaluate the tolerance of the Kentucky bluegrass cultivars 'Kenblue' and 'Fylking' to *X. campestris*.