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 moved 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.