

Turfgrass Weed Control 1992 Research Summary

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Postemergent Goosegrass Control in Bentgrass Turf

Low rates of Acclaim (fenoxaprop) were evaluated for safety to 1/2 and 1/4 inch-cut Pennncross creeping bentgrass and for efficacy on seedling goosegrass. Acclaim applied three times on 14-day intervals at 30 GPA caused noticeable turf yellowing. The discoloration was more severe and persisted longer at 1/4 inch than at 1/2 inch mowing height. However, applying Acclaim in 100 GPA (the same amount of a.i. but in a more dilute spray) produced no yellowing. In previous years some yellowing was observed with the 100 GPA treatment, but clearly, the level of injury can be reduced by using the higher gallonage.

While these low rates of Acclaim have been effective on seedling crabgrass, results on goosegrass have been inconsistent. In 1992, the results were again inconsistent. In a golf course fairway, these treatments provided only about 25% goosegrass control. In contrast, identical treatments at our research farm provided complete control. Possible reasons for this variability will be investigated in 1993.

The experimental herbicide Illoxan (diclofop) controlled goosegrass with a single application at 0.5 lb ai/A.; however, in 1992, 0.75 lb ai/A was necessary. Bentgrass injury increased with increased rate. Bentgrass mowed at 1/2 inch recovered more rapidly than did turf mowed at 1/4 inch. By 1 week after treatment, diclofop injury to 1/2 inch cut turf was barely noticeable, but 1/4 inch cut turf required two weeks for injury to reduce to the same barely noticeable level. While the degree of yellowing was slightly higher than that observed with Acclaim at 0.032, the fact that Acclaim must be reapplied three or more times results in a significantly longer period of time that the turf is yellow. Additionally, the Illoxan was also effective on tillered goosegrass whereas this low rate of Acclaim is not. Research in 1993 will investigate lower rates and tank mixtures for reducing bentgrass injury and enhancing goosegrass control.

Granular Herbicide Formulations for Postemergent Broadleaf Weed Control

Over the past two years we have evaluated several granular formulations of new herbicides for postemergent broadleaf weed control in turf. Applications of granular formulations of Confront (clopyralid + triclopyr) with quinclorac controlled

clover, dandelion, and plantain as well as or better than a commercially available 2,4-D + 2,4-DP granule. The efficacy of granular formulations was slightly less than comparable spray treatments. Fall applications of all products were more effective than spring or summer treatments. The data suggests that Confront alone would adequately control these weeds. This will be investigated in 1993 tests.

Ground Ivy and Veronica Control

Several tests were conducted to evaluate Gallery (isoxaben) applied alone and in tank mixes with Turflon II Amine (2,4-D + triclopyr) for control of these hard to kill species. Previous data has shown that Gallery + Turflon II controls healall (*Prunella vulgaris*) and creeping speedwell (*Veronica filiformis*) better than either product applied alone. In 1992 Upstate tests, combining Gallery at >0.5 lb ai/A with the labeled rate of Turflon II Amine provided better ground ivy control than either product applied alone. While Turflon II provided rapid knockdown, weed regrowth was rapid. Gallery acted very slowly, with control increasing over time. In Long Island experiments, combining the rapid action of Turflon II and slow action of Gallery improved control of ground ivy, but not speedwell. These tests will be repeated in 1993 in an effort to better estimate the consistency (or lack thereof) of this tank mixture for ground ivy and *Veronica* control.

Biological Control of Annual Bluegrass with *Xanthomonas campestris* pv. *poannua*

In 1992 we investigated methods for enhancing the efficacy of this bacterium for control of established annual bluegrass including frequency of inoculation, and new strains of the bacterium. We also investigated several factors which could influence the level of control including N-fertility, soil moisture stress, and annual bluegrass subspecies differences.

Inoculation frequency

The bacterium was applied once, twice, or three times per week over 1, 2, 3, or 4 weeks. Annual bluegrass control increased with increased number of consecutive weeks of inoculation (See Figure 1). Number of applications per week was significant in one test but not in a second. The

maximum control (as measured by reduction in above-ground live tissue) of about 40% in the first test and 30% in the second, was obtained when plots were inoculated with each mowing over four weeks.

Annual bluegrass subspecies and bacterium strains

In field and greenhouse tests, the perennial subspecies of annual bluegrass (*Poa annua* ssp. *reptans*) was slightly more tolerant than was the annual subspecies of annual bluegrass (*Poa annua* ssp. *annua*). However, the differences observed between subspecies do not explain the dramatic differences in results between Northern U.S. experiments and Southern U.S. tests. Therefore, it is likely that our environmental conditions in N.Y. are not favorable to the bacterium. In these same tests, two isolates of the bacterium, one from Michigan and one from California, were compared and found not to differ in their efficacy.

Effects of Drought and Nitrogen Fertility on Annual Bluegrass Control

Results from growth chamber experiments suggests that if the annual bluegrass is experiencing any stress at the time of inoculation, control will be reduced. Inoculating vigorously growing weeds, then imposing drought (or other stress) appears to improve control.

These tests were conducted by Dr. Ting Zhou, a postdoctoral research associate, and by Ms. Nancy Williams, a graduate student. Although both Ting and Nancy have gone, the biocontrol work will continue in 1993.

Preemergent Herbicide Treatment to Seeding Intervals

1992 was the third year of this test in which Dimension (dithiopyr), Lescro Pre-M (pendimethalin) and Ronstar (oxadiazon) were applied 1, 2, 3, 4, or 5 months prior to seeding Kentucky bluegrass, perennial ryegrass, chewing fescue, and creeping bentgrass. When the three years are compared, dramatic variability between years is noted. Safe intervals for Dimension EC were between 2 and 5 months; for pendimethalin, 3 to 5 months; for Ronstar 4 to 5 months. These studies underscored the important role of weather conditions on preemergent herbicide residual longevity. In 1991, near-record drought prolonged residuals; in 1992, record rainfall reduced the length of the residual; and in 1990, an average year, the length of residual was between 1991 and 1992 figures.

Data suggests that use-rates of Dimension EC will have similar treatment to seeding intervals as does pendimethalin; and that Dimension granules will have a slightly longer residual similar to Ronstar 2G. It is important to note that when pre/post tank mixtures are applied for crabgrass control, special attention should be paid to the interval from such applications to overseeding dates. While such combinations would not have affected seedling establishment in 1992, these intervals would have decreased seedling establishment in the previous two years. Reducing the rates of residual herbicides used in pre/post combinations may avoid such effects. If herbicide residues are suspected, it is advisable to conduct a bioassay before seeding (see *CUTT* Vol. 2, No. 2 or *Weed Facts* No. 3).

It is likely that environmental conditions in New York are not favorable to the bacterium Xanthomonas campestris pv. poannua.

Inoculating vigorously growing weeds with bacterium, then imposing drought (or other stress) appears to improve control of annual bluegrass.

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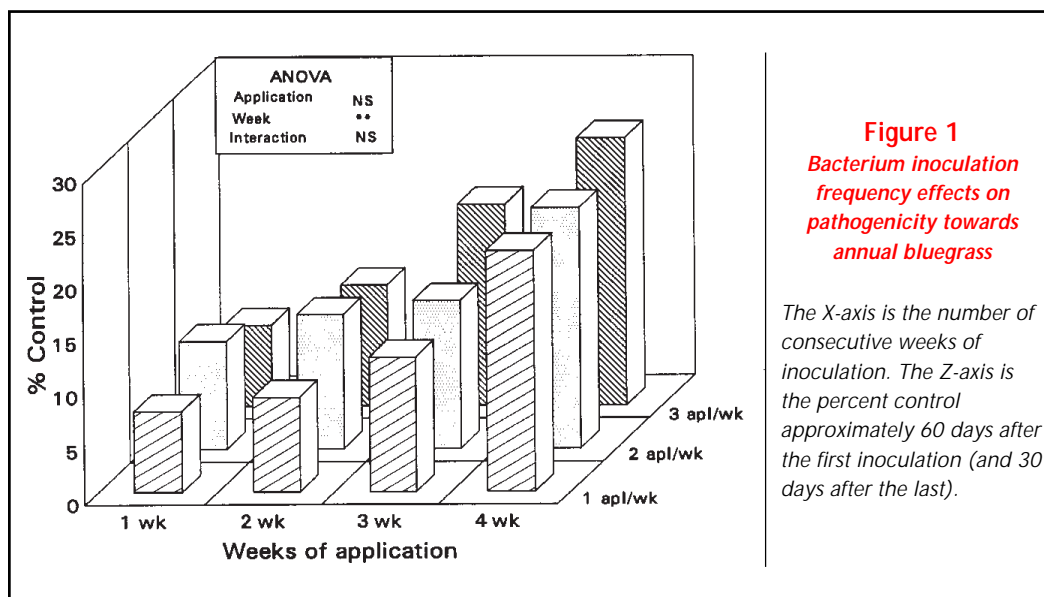


Figure 1
Bacterium inoculation frequency effects on pathogenicity towards annual bluegrass

The X-axis is the number of consecutive weeks of inoculation. The Z-axis is the percent control approximately 60 days after the first inoculation (and 30 days after the last).

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