

GROWTH SUPPRESSION STUDIES ON ROUGH TURF
William E. Chappell

A renewed interest by the agricultural industry in the development of growth regulators has been partially attributed to the energy crisis. The use of these materials in an integrated management program would reduce the number of mowings and conserve fuel as well as labor and would provide needed savings while still maintaining an acceptable appearance.

Three studies were undertaken to establish the efficacy of specific plant regulators. Study 1 concerned a product known as EL-72500 for the suppression of cool season grasses on highway rights-of-way. A test section was established near Harrisonburg, Virginia. For comparison purposes, 180-ft² plots were used. The turf was a mixed stand of tall fescue and bluegrass as a predominant species. At the time of application, the turf was 2-4 in in height and had just broken dormancy. A second plot had creeping red fescue as the predominant turf species.

There appears to be an inconsistency in the results of this study in that the lower rates of application of the material appeared to be more efficient. This inconsistency may be explained by the composition of the turf species within these plots. Lower rates were applied to areas dominated by fescue, while the plots with the higher rates contained significant quantities of bluegrass. The bluegrass was more prolific with respect to seedhead production. The optimum rate in this situation appears to be 2-3 lb (ai)/A rate. No significant increased suppression is given by higher rates. It was observed that there was a nearly linear response between the rates of application and the blade length retardation.

Although the number of seedheads produced is considerably greater than the turf treated with a conventional growth regulator, the seedstalks were reduced in height. Previous work indicates that seedhead density may be reduced by 95 percent with application of maleic hydrazide or melfluidide. However, unaborting seedheads develop normally and attain nearly full height. This all-or-nothing response does not appear to be prevalent with applications of EL-72500.

There was some objectionable appearance in the treated areas, especially where the higher rates were applied. There was an apparent general discoloration and a reduction in stand density. Only minimal tipburn and general chlorosis were noted. If the applications are made at earlier stages of development, it may help to alleviate this problem.

Study 2 included a product known as PP-333. Again, this used both the wettable powders and liquid formulations. Tall fescue was the predominant species and ranged from 2 to 5 in in height at the time of treatment. Individual plots were 3000 ft² in area.

Very favorable results were given by both formulations of this material. The reduction in seedhead density was greater than expected and comparable to melfluidide standard. The dispersible powder formulation did result in tip burn, which was approaching an unacceptable level. This did not occur with the granulation formulas. There was some objectionable appearance as noted with study 1.

Study 3 compares the use of all of the above noted plant regulators for use on rough turf at a site near Shawsville, Virginia. Tall fescue was the predominant species with lesser amounts of creeping red fescue and bluegrass. The turf ranged from 7 to 9 in in height at the time of treatment. Granular formulations and water soluble formulations were

used. The PP-333 did not give the levels of seedhead density reduction that were experienced in the previous study. Seedhead height was generally reduced by more than 50 percent with this compound. The wettable powder formulation of EL-72500 gave a reduction in seedhead density and blade length suppression comparable with those given by the PP-333 treatments. The reduction of seedhead height was somewhat less. Neither of the experimental compounds inhibited seedhead formations as well as the standards, although seedhead height and blade length were appreciably reduced with respect to the standards. The standards performed as expected with maleic hydrazide providing a 99 percent reduction in seedhead density.

Tip burn appeared to be erratic and rather inconsistent. The general thatchy appearance previously described occurred on plots treated with PP-333 and EL-72500. This condition did not appear to be objectionable as in prior applications. The thatchy appearance subsided over the growing season with eventual growth of the turf. There was a slight general chlorosis on turf treated with the standards. This was not considered objectionable. No objectionable appearance occurred on plots treated with melfluidide.

MULTIFLORA ROSE CONTROL STUDIES WITH SOIL
APPLIED HERBICIDES
William E. Chappell

Efforts in Virginia are currently under way to arrest the spread of multiflora rose and to eradicate existing stands in an attempt to reclaim and maintain grazing land. This is due to the spread from highways where this material was planted for use as living fences, for headlight glare, and as crash barriers. These studies were conducted to determine the efficacy of several herbicides for the control of multiflora rose.

Two sites in southwestern Virginia were selected for testing. All of the herbicides were uniformly distributed by hand, with the exception of Spike, which was applied with a stainless steel backpack sprayer. The treatments were applied on March 28, 1979, at the initiation of bud break, and they were evaluated on October 11, 1979, at the first site. At the second site, the initial treatments were applied on April 12, 1979, and were evaluated on October 15, 1979. All of the treatments at this site were applied to the soil near the base of the stem.

Weather conditions were very favorable for evaluating soil-applied herbicides. In general, the results obtained at the first site were somewhat less than expected. Amdon 10-K was the only treatment that gave complete control. The treatments of DPX-3674 did give impressive levels of control; however, it is questionable whether the high rates used in this study would be acceptable on a commercial scale. These treatments also resulted in the eradication of forage grasses in the treated area. Spike 20 P applied at 3 and 6 lb/acre also gave ratings that were similar to those of Amdon 10-K. Although none of the treatments applied at the second site gave complete control, several resulted in impressive ratings. Amdon 10-K gave very high ratings. Spike 20 P also gave impressive control. Very high ratings were also recorded for the relatively high application rates of the dry formulations of other herbicides. The liquid formulations, Banvel and Tordon K, gave ratings higher than expected. Al-

though the rates of the liquids were relatively high in comparison with the dry formulations, they were easily and effectively applied with the spot-gun applicator. The results for the first test are given below [the control rating is based on a subjective, visual estimate of crown injury (0 = no control, 10 = complete crown death); ratings with the same letter are not significantly different at the 5 percent level of the Duncan's multiple range test].

Treatment	Rate [lb(ai)/A]	Avg Control Rating
Amdon 10-K	4	10.0
Banvel 5G	8	5.3
Banvel 5G	10	6.3
Banvel 5G	15	6.0
Banvel XP	8	5.6
Banvel XP	10	5.6
DPX-3674-A	10	8.7
DPX-3674-A-1	10	8.7
DPX-3674-A-1	20	9.3
Spike 20 P	2	6.7
Spike 20 P	3	7.7
Spike 20 P	6	8.0
Spike 80W	3	7.0
Control	--	0.0

PERFORMANCE-BASED CONTRACT SPRAYING

Donald Dalton

Dalton's presentation indicated that a performance specification with a written guarantee for herbicide spraying could be a valuable tool for the maintenance engineer.

NEW DEVELOPMENTS FROM DUPONT

Turney Hernandez

Herbicides are maintenance tools and we must learn to use these tools to maximize return on our maintenance investment, keeping in mind the many factors that affect performance. The key to success in vegetation management is the proper use of these herbicides in programs designed and planned over the long term.

The E.I. DuPont Company has roadside and industrial weed control specialists in most states in the United States. They work as a team in the roadside market. The company's objective is to supplement the efforts of roadside vegetation management specialists in every state with plot work, equipment adaptation or modification; helping with surveys, and assisting in developing efficient and effective use programs. We want to help you, the roadside vegetation management supervisor, accomplish the best job at the lowest cost. To do this, we position DuPont products along with those of other manufacturers in programs to accomplish this objective. These programs must be safe and satisfy the needs of your state. Some new developments from DuPont are

1. The development of a new 2-lb/gal water soluble formulation of Velpar;
2. The introduction of a 10 percent pelleted formulation of Velpar called the Gridball, which contains 0.335 g active ingredient per pellet for brush control; and
3. The introduction of krenite S, a new formulation containing a suitable surfactant.

DuPont is also developing three promising new

herbicides. A broadleaf weed killer that will control most of the problem annuals at rates of 0.25-1.25 oz/acre, a compound that is selective for control of Johnsongrass at rates between 0.25 and 1 lb/acre, and a foliage absorbed brush control that appears to be broad spectrum.

DOW HERBICIDES THAT WILL BE AVAILABLE IN THE FUTURE FOR ROADSIDE WEED CONTROL

Robert D. Fears

For many years, the Dow Chemical Company has sold herbicides for roadside weed control and will continue to develop herbicides for this use. These herbicides will have the ability to be used without adverse effects on applicators, wildlife, fish, or the environment. They will exhibit unique biological activity that will give advantages in weed control not offered by competitive products.

Due to continued cost escalation of raw materials, energy, and labor, new herbicides will sell at higher prices. As with present herbicides, the new products will also control a wider spectrum of woody plant species when mixed with other chemicals such as 2,4-D or Tordon.

One of the new products that Dow now has available for roadside weed control is Garlon. Garlon is the trade name for triclopyr or 3,5,6-trichloro-2-pyridinyl-oxyacetic acid. Through field tests and commercial applications, it has been demonstrated that Garlon herbicides are highly effective for the control of many woody plants and some broadleaf weeds. Herbicidal action of Garlon or triclopyr is through characteristic auxin-type response.

Formulations of triclopyr include Garlon 3A herbicide, which is a water-soluble triethylamine salt containing 3 lb of triclopyr/gal and Garlon 4 herbicide, which is an oil-soluble, water-emulsifiable butoxyethyl ester containing 4 lb of triclopyr acid equivalent/gal. Garlon herbicides are low in acute oral toxicity to mammals. Undiluted Garlon 3A is moderately to severely irritating and injurious to eyes and may cause slight to moderate skin irritation. However, when diluted with water for ground application, it becomes essentially nonirritating to the skin and may cause only slight discomfort and effects to the eyes. Undiluted Garlon 4 is essentially nonirritating to eyes and may be slightly irritating to the skin. Neither formulation is absorbed through the skin in acutely toxic amounts. Although Garlon 4 is toxic to fish, Garlon 3A is very low in toxicity to fish. Both formulations have very low toxicity to mallard duck and Japanese quail. Under temperature and moisture conditions favorable for microbial activity, triclopyr degrades quite rapidly in soil.

Lontrel, the trade name for DOWCO 290 or 3,6-dichloropicolinic acid, is the second new herbicide that Dow is developing. It has exhibited excellent herbicidal activity against members of the Polygonaceae, Compositae, and Leguminosae plant families. Like Garlon, DOWCO 290 induces characteristic auxin-type responses in growing plants. Lontrel 205, which contains 2 lb of 2,4-D acid equivalent and 0.5 lb of DOWCO 290 acid equivalent per gallon as the alkanolamine salts and M-3972, which contains 3 lb of DOWCO 290 acid equivalent per gallon as the monoethanolamine salt, are formulations being tested for weed control in turf and on roadsides.

DOWCO 290 and its formulations have low acute oral toxicity to mammals and are not absorbed through the skin in acutely toxic amounts. DOWCO