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## How to Better Control Broadleaf Weeds Safely

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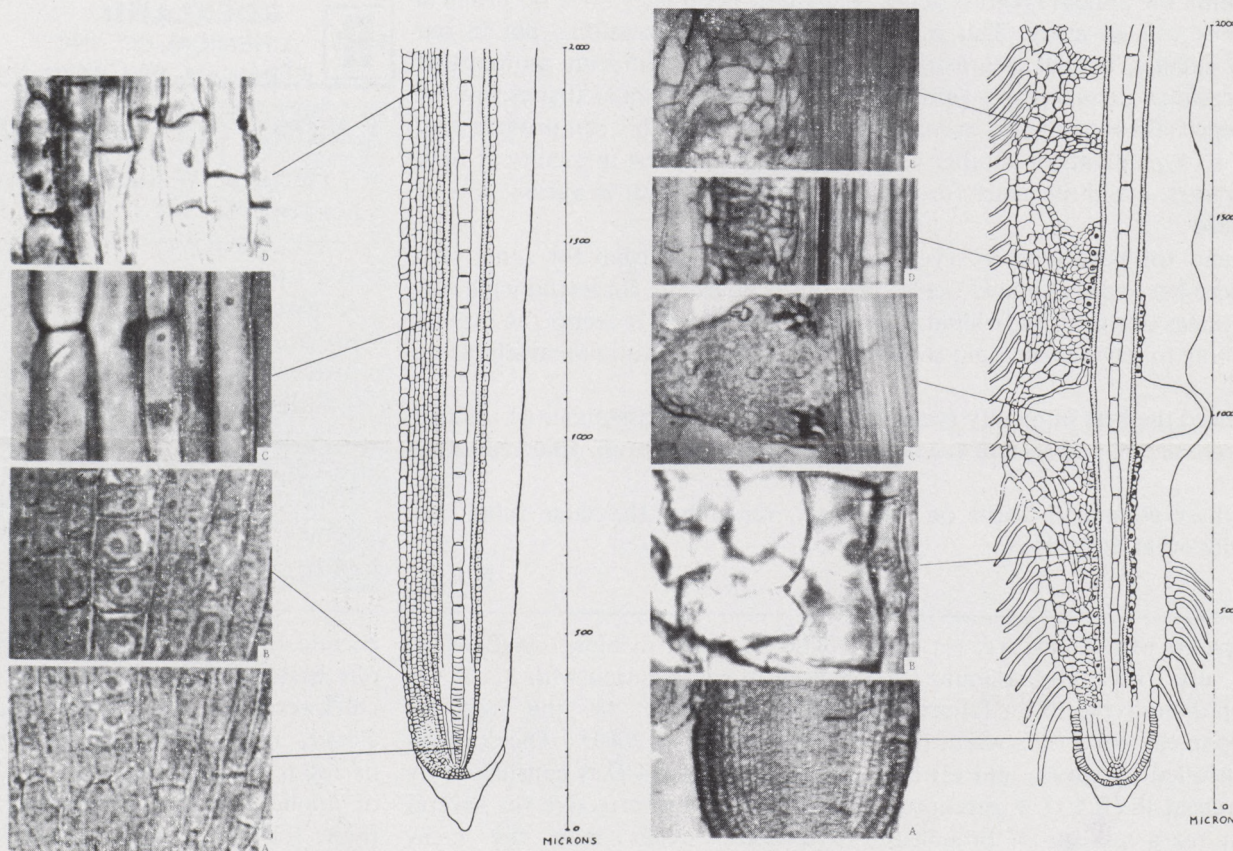
Amine and ester formulations of 2,4-D are commonly available and are registered for a variety of uses. Both

types work well on dandelion, buckhorn, and broadleaved plantain and they control various other broadleaf weeds that are found in turf. Low volatility formulations are available. While they cost considerably more than amines and high volatility esters, they should be used when other sensitive plants or crops are nearby. This is especially true when large areas are treated in the spring when other

plants have sensitive new growth.

Mecoprop (MCP) is a propionic form of phenoxy that has come into more common use since the suspension of silvex, a closely related phenoxy. It assists 2,4-D in killing approximately the same variety of weeds as was true for the combination of 2,4-D plus silvex. Compared with 2,4-D it gives poor dandelion control. The most important deficiencies of mecoprop

FIGURE 1



Left—Drawing and photomicrograph counterpart sections of a normal Colonial bentgrass root that received no phenoxy treatment.

Right—Drawing and photomicrograph counterpart sections of a Colonial bentgrass root that received silvex treatment. Note the abnormal growth habit.

(Photo from Lloyd Callahan and Ralph Engel)



# Comments and Opinions

## Choose Ryegrass Seed Carefully

The turf-type ryegrasses, which have been one of the major turfgrass advances of our generation, have encountered considerable abuse in certain segments of the seed trade. Occasionally, growers complain about the coarseness of these grasses. If you were not present on the June 3, 1981 Turf Research Day, you missed a convincing demonstration of the reason for choosing turfgrass seed carefully. Seed control officials of New Jersey, Maryland, and Pennsylvania had sampled various lots of perennial ryegrass that have been offered for sale and had them planted in replicated turf trials.

A number of these seed lots showed either varietal substitution or contamination with annual ryegrass. Great contrasts in texture, density, and leaf extension rate occurred in some of our most attractive turf ryegrasses. While all ryegrasses tend to be tough to cut at times, the common-type ryegrasses, substituted for improved turf types, are much more difficult to mow.

Violation of seed labeling appears to occur frequently with Manhattan ryegrass. Seed of this grass is more expensive to grow and it is still in great demand. This leads to the contamination or substitution that occurs with this grass variety. Manhattan has a nonfluorescing ryegrass seed. If the fluorescence test were used, this would do a lot to correct the problem of impure Manhattan ryegrass sources. This technique can also be used on most other turf-type ryegrasses. Whenever possible, the plant breeder or releasing agency should provide high purity that can be protected in new turf-type ryegrass varieties.

Some think the annual ryegrass genes or off-type ryegrasses offer no problem — that they will go away. This may happen on some occasions, but in our Northeast climate, annual ryegrasses can persist for years in some mowed turf areas. Occasional annual plants germinate and develop seedstalks that escape the mower (especially where voids occur or in border areas). This can provide seed for more off-type plants in another year. If you want the best in quality of turf-type ryegrasses, avoid the genes for coarseness that can occur in various lots of ryegrass seed.

A demand for pure types of ryegrass will cause a hardship for some seed growers who have contaminated fields. Yet, this is no excuse for introducing off-type ryegrasses on many individual sites in the Northeast. It seems the grower who is willing to pay has the right to all the worthwhile information available on grass seed.

If you need the best in quality ryegrass seed or just want assurance of the real thing, purchase certified seed of the desired ryegrass variety from your reputable seed dealer.

While these comments focus on ryegrasses, remember the same thing can happen with other turfgrasses.

R.E.E.

use compared with silvex are: (1) the need to use twice the amount of mecoprop than silvex, (2) the failure of mecoprop to control certain weeds that were controlled by silvex, and (3) the need to repeat the 2,4-D + mecoprop treatment for a number of broadleaf weeds.

The 2,4-D plus mecoprop treatment is safer for trees and shrubs than the 2,4-D plus dicamba treatment. For this reason it is more widely used on home lawns.

The phenoxy, dichlorprop (2,4-DP) is used in combination with 2,4-D for purposes similar to the use of mecoprop with 2,4-D. Dichlorprop combined with 2,4-D is considered by some to be more effective for several hard-to-kill weeds than the combination of mecoprop + 2,4-D.

**The Use of Dicamba** — Dicamba (3,6-dichloro-o-anisic acid) is a nonphenoxy herbicide, of the growth regulator type, that is valuable for control of broadleaf weeds. This

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chemical, which is sold as *Banvel-D*, is our best herbicide for such weeds as chickweed, knotweed, red sorrel, white clover, and others. It is especially useful for wild onion. Required rates of application are considerably lower than for other turf herbicides. A treatment of 1/4 lb per acre is adequate for many weeds. When combined with 2,4-D at rates of 1/32 to 1/8 lb per acre, the efficiency of the treatment is enhanced.

Dicamba may cause serious injury to



trees and shrubs unless applied at low rates. Part of the reason is its quick penetration into the soil. There is evidence that 1/2 lb per acre is safe around trees. This is twice or more of the rate normally used on turf. However, if differences in trees and shrubs, the tendency for some plants to root near the surface, and the chance of overdosing are considered, it is best to avoid use of dicamba in such areas. If it is included with 2,4-D on such sites, the rates of application should be minimal.

**Comments on Control of Broadleaf Turf Weeds** — Dandelions are the most common weed of turf. They, along with such weeds as buckhorn and broadleaved plantain, are easily controlled with 2,4-D, as mentioned earlier. When one or more of these weeds are being treated, 2,4-D should be the choice. For most turf areas, 1 1/2 lb per acre of 2,4-D in a spray application is sufficient. Where some hard-to-kill weeds are present or the season is unfavorable, and the turfgrasses are tolerant, it is best to use the full rate. Rates of 2,4-D should be somewhat higher when used on a dry carrier than with spray application.

One of the keys to efficient control of these weeds is persistent control. Total control of dandelion is difficult because a prolific amount of wind-borne seed is produced. When only a few dandelions are present in a small area, spot treatment of individual

dandelion plants may be best. This is often quicker and safer than total treatment of a site.

## Control of Other Weeds with Dandelions Present

Frequently other weeds such as chickweed, clover, and knotweed occur with dandelions. These require the addition of mecoprop, dichloroprop, or dicamba. This combination will control additional hard-to-kill broadleaf weeds.

**Dandelion, Chickweed, Clover, and Knotweed** — If trees and shrubs are not present, dicamba plus 2,4-D is the best choice. This combination has the highest efficiency for these weeds. Also, less phenoxy is used and the treatment is safer for the grass than a combination of several phenoxys. With Kentucky bluegrass-type lawns, apply 1 to 1 1/2 lb/A of 2,4-D and 1/4 lb dicamba per acre. With bentgrass-annual bluegrass turf, apply 1/2 lb 2,4-D and 1/8 - 1/4 lb dicamba per acre. With these weeds mid-April through early May is the best treatment time. Applications for chickweed, clover, and knotweed control in late spring or summer are not desirable.

**Dandelions, Buckhorn, Broadleaved Plantain, and Red Sorrel** — Lawns with this assortment of weeds usually are sunny and lack vigor as indicated by the presence of red sorrel and buckhorn. An application of 1 to 1 1/2 lb of 2,4-D plus 1/4 lb of dicamba per acre is suggested. Also, proper liming and an increase in fertilization is needed.

**2,4-D — Susceptible Weeds and Wild Onion** — This combination of weeds may occur in full sun and where trees are present. The 2,4-D plus dicamba combination described above is appropriate for the tree-free areas, but in the shade a combination of 2,4-D + mecoprop with a low rate of dicamba can be used to spot treat rather than a general spray. If spraying the herbicide over the lawn is desirable in shade or tree areas, use the combination of 2,4-D plus mecoprop. This combination will require more retreatment.

**Clover Control** — While clover is tolerated or welcomed in some turf areas, it is frequently unwanted by some because it attracts bees, it

provides poor cushion for most sports, it offers a slippery footing, and it yields poor soil cover in winter. It is seldom treated purposely in home lawns, but it is often controlled with herbicides in such areas as athletic fields and golf course fairways.

Clover is more abundant where nitrogen use is low. If there is the need to fertilize, the added nitrogen should increase the vigor of the grasses and give adequate clover control for most lawns.

In turf areas where good control of clover is desired and no other weeds require attention, an application of 1/4 lb of dicamba per acre usually gives excellent control.

In Kentucky bluegrass type turf, late summer or early fall is the best time for clover treatment. Fall treatment produces good clover control on bentgrass-annual bluegrass turf, but spring is a better time for treatment because it causes less encroachment of annual bluegrass. When only clover is present in bentgrass-annual bluegrass

(continued on page 5)

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# One Man's Experience with Wetting Agents

**Bruce Williams**  
**Bob O'Link Golf Course**

*Wetting agents have been around fine turf a long time and enjoyed some good reception, but a hesitancy about their use remains. When one of the men associated with the packaging and sale of wetting agents came to my office years ago, I was asked for my opinion. Without benefit of research support or literature review, I told him that I believed there were situations where wetting agents would serve a practical purpose in watering "hard to wet areas." I suggested a concentrated research effort to determine turf conditions that would be worthy of this type of treatment. This has been told to other dealers or would-be dealers. Unfortunately, we still lack adequate treated and untreated comparisons. I have always believed, and I have said many times, that wetting agents would help get water through hard-to-wet turf surfaces. We do have a number of experienced golf club course superintendents who are convinced of their value. William Smart is one of the known believers in our region.*

*The following is a review of wetting agents by Bruce Williams of Bob O'Link Golf Course. I believe you will find this first-hand account of interest. We do not know for sure, but we expect that his experience applies to lawn turf also.*

*Ralph Engel*

During the past two summers, I have attempted to take my successful results with wetting agents on greens and tees another step further and incorporate preventive applications on 35 acres of fairways. Through trial and error, the following have provided optimum results.

**Choice of Wetting Agents.** Three wetting agents gave good results. I happened to prefer one type for results and ease of handling. Similar products are available under different labels. The experts seem to agree on the nonionic forms. You might wish to experiment with various wetting agents for your conditions.

**Application Techniques.** The primary fairway application is made in early to mid-June and a second application should follow in 14 days. A third application in late July or in August may be desirable. With generous rainfall, two applications may prove sufficient.

1. I used the recommended rate of two gallons of a wetting agent in 200 gallons of water over one acre.

2. Wetting agents not watered in are potentially phytotoxic. I prefer early evening application with prompt watering in.

3. All wetting agents were applied alone and not in combination with any other pesticide.

4. We used the boom behind the tractor, which reduces the chance of wheel tracks showing.

**Effects on the Turf.** Comparing wetting agent treated fairways and untreated check plots, I found that the difference was like night and day. Treated fairways had the following qualities:

1. Dew is eliminated for a six to seven day period following the application.

2. Localized dry spots in the wedge-shaped area adjacent to our single row irrigation system required hand watering only once during the 1979 season. Prior years have shown that 80-100 man-hours are needed to accomplish this task. Less hand watering means a lower labor cost and freedom to use your staff on other projects. Less hand watering means minimizing or eliminating interference to golfers. Less hand watering also means conservation of water and power.

3. Fairways had fewer dry spots and also fewer wet spots.

4. Overall, soil moisture continuity was increased.

5. Soils were able to absorb moisture more rapidly during the month of August when heavy precipitation was recorded.

6. Less stress was evident on treated fairways and wilting was not severe.

7. Prior to fairway applications, it

was often difficult for irrigation water to penetrate a one-inch thatch layer unless fairways had been sliced or aerated in the spring.

The fairway applications have proven as successful as the wetting agent program on my greens and tees. The approximate cost of materials for one application for 18 greens is \$150. Thirty-five acres of fairways would be covered with \$700 worth of wetting agent. Given the aforementioned results, I feel that this is a cost which is offset by a savings in water and manpower, providing a better playing surface.

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## Fertilizer Controls Dollar Spot on Ryegrasses

Where rye grass tees are mowed at 1/2" and the clippings removed, dollar spot may occur. A shot of balanced fertilizer overcomes that problem. The disease may still be there, almost unnoticeable, but the new growth seems to overcome it. This is also true around greens where the sprinkle pattern seems to leach away the nutrients. Especially nitrogen.

— Bill Lyons



## Broadleaf Weeds

(continued from page 3)

turf, the end of April or early May is preferred. With normal spring rains and four to six weeks of good growing weather, the grasses will fill the voids nicely. Treatment in June or later creates bare patches that remain until good growing weather occurs in late summer.

As indicated previously, inclusion of dicamba, dichloroprop, or mecoprop with 2,4-D gives good clover control. In bentgrass turf the rate of dicamba can be as low as 1/8 lb per acre when applied with 2,4-D. Combining mecoprop or dichloroprop with 2,4-D for clover control or other broadleaf weeds gives a high total amount of phenoxys. This is not advised as it causes a serious reduction in the safety margin for bentgrass and annual bluegrass.

**Some Thoughts on Broadleaf Weed Control with Herbicides** — A discovery such as the herbicide 2,4-D, with its selectivity and safety, is a rarity. While it is not perfect, it is likely to be the mainstay of our broadleaf weed control programs for many years. We should learn more about its use and

develop more highly sophisticated procedures.

One important and complex factor is time of treatment. With dandelions, different opinions exist as to the best time of treatment. Mid- to late April has distinct advantages. More specifically, applications should be made as soon as the dandelion plant has developed good leaf growth. Delay until the plant starts flowering permits seed to develop and enough seed can be scattered to start a new population later in the year or the next season. In contrast, some prefer September and early October treatments. Good kill occurs if cool and moist weather gives vigorous growth. However, dandelions may still germinate in late fall and early spring which may necessitate spring application. The same applies to chickweed. Knotweed is not controlled with fall treatments. While this season gives good clover control, annual bluegrass can be a problem.

Another concern with fall treatment is the frequent need for fall overseeding. Use of 2,4-D complicates seed programs. Where overseeding is anticipated, 2,4-D applications should be made in late August, which will allow time and several rains to reduce 2,4-D injury.

In spite of these concerns, it is often advisable to go ahead with fall treatment of dandelions that are causing an ugly problem. Since phenoxys are less effective when plants are growing very slowly or are dormant, time treatments with good growth of the weeds.

The knowledge that the phenoxys can hinder root development (see figure) leads to the question of which

season causes the least injury to the development of the root system. Fall and early winter are the major periods for initiation of root growth of the cool-season grasses. Application of herbicides during these times can cause increased turf failure during environmental stresses of the following summer. Since most of these grasses appear to attain maximum root development at or just before the peak growth period in spring, it would seem that spring application of phenoxy herbicides might be somewhat less damaging than fall. However, there is no research data that support this view. Until more is known, apply phenoxys when the weeds are growing well and with all other precautions.

Plan ahead for broadleaf weed control programs. Check the equipment carefully before starting. Follow label instructions. As turf growers, we have some very useful broadleaf herbicides which can work for you.



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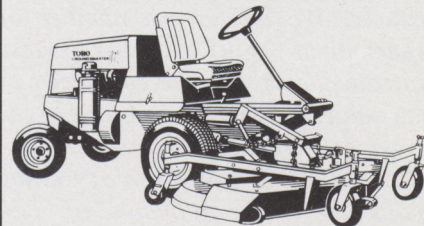
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# ABSTRACT

## Mowing Height, Irrigation Frequency, and Soil Moisture Effects On Water Consumption and Growth Rate of 11 Turfgrasses

I. Biran, B. Bravado,  
Bushkin-Haray,  
and E. Rawitz  
Agron. J. 73:85-90. 1981.

Water use yield of clippings were determined for 11 turfgrasses. Two were cool-season and nine warm-season types. The former turfgrasses belong to the C-3 and the latter to the C-4 group. The plants were grown in containers under summer conditions of the warm, semi-arid zone. The growth rate of plants in the C-3 groups was similar to that of those in the C-4 group, but their water consumption was higher. Amongst the C-4 group, those plants with a sparse, vertical growth habit, typical of forage crops, had a higher growth rate and water consumption than the dense, low-growing ones.

Delaying irrigation until the onset of temporary wilting caused a significant decrease in water consumption and growth (up to 35 percent) in most grasses. Raising the clipping height from 3 cm (1.2 inches) to 6 cm for a period of six weeks led to increased vigor in all grasses as evidenced by growth rate, chlorophyll content, and water consumption. This effect was continuous throughout the measurement period for the C-3 types, but was temporary for the C-4 types, which declined after six weeks.

With constant 34.5°C temperature, net photosynthesis of tall fescue (*Festuca arundinacea* Schreb. 'Alta') (C-3) was only about one-third that of C-4 grasses, although the evapotranspiration rate was equally high. The water uptake of the C-4 type *Zoysia matrella* (L.) Merr. ceased at a much higher soil water potential than that observed for the C-3 tall fescue

and other C-4 types. The decline of the rate of photosynthesis preceded the drop in transpiration rate caused by the decreasing soil water potential.

**Editor's Comment:** Since the beginning of turfgrass science several generations ago, warnings against close or severe cut have been given when drought stress is of concern. The benefits of higher cut were often associated with lower soil temperatures. This appears to be untrue or an oversimplification according to this study from Israel. Both higher cut and taller grass types gave increases in water use along with better growth rate and chlorophyll content. This suggests that higher cutting improves summer survival more through better growth of the grass than a saving in water consumption. The decrease in water use by permitting temporary wilt should be considered. Of course, we must remember that some types of turf do not tolerate much wilt. While irrigation studies on turf seem a remote possibility for our climate, it seems they should help us attain better efficiency with the water we use.

## New Insecticide, Oftanol, Approved for Use

Louis M. Vasvary  
Extension Specialist  
in Entomology  
Cook College, Rutgers University

On May 14, 1981, the New Jersey State Department of Environmental Protection issued a Section 24-(c) registration for Oftanol 5 percent Granular insecticide. Oftanol (common name: Isufenphos) is for commercial applicator use only on commercial and residential turfgrass including golf courses, cemeteries, sod farms, industrial grounds, parkways, residential lawns, and other similar areas.

Oftanol 5 percent Granular insecticide is now available from your supplier. The approximate cost of

material to treat an acre is \$65.00 (\$1.50 per 1,000 sq ft).

During the past four years Oftanol has given excellent control of white grubs (including Japanese beetle grubs) in experimental trials. In addition to white grubs, Oftanol 5 percent Granular is labeled for *Hyperodes* weevil, bill bugs, chinch bugs, and sod webworms.

For white grub control, use 20 to 40 pounds of Oftanol 5 percent Granular per acre (0.45 to 0.9 pounds per 1,000 sq ft). Use the higher rate for high grub population densities. Applications can be made in mid- to late July through August.

For *Hyperodes* weevil, bill bugs, chinch bugs, and sod webworms, use the 40 pound per acre rate.

Oftanol 5 percent Granular should be applied with either a drop-type or rotary-type spreader. Avoid the use of spreaders which would apply the material in narrow concentrated bands.

The signal word on 5 percent granular Oftanol is "CAUTION". Do not contaminate water when you are cleaning the application equipment or during disposal of waste materials. Do not graze treated areas or use clippings from treated areas for feed or forage. Oftanol is toxic to fish and wildlife. Do not collect clippings from first mowing after application. Do not reuse the container. Completely empty the contents and bury the unused chemical at least 18 inches deep in an approved landfill or noncrop land away from water supplies. Burn the empty container completely and stay well away from the smoke.

Fortunately, Oftanol has arrived on the scene in time to solve many of our insect problems in turfgrass.

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