

AN UPDATE ON WEED CONTROL PROGRAMS

Update: to revise, with change. This is a suitable definition for the word as it relates to turf weed control. To many, perhaps most of us, the change aspect immediately centers on "new" herbicides. But, it seems that any herbicide is "new" if the turf manager has never used it, and perhaps never heard of it before. More than two dozen or so herbicides are commonly used in the turf industry, yet most turf people have used no more than 5 or 6 different chemicals for weed control. Also, from the new standpoint, there are a few herbicides that may have been on the market for only a short time, or they may have been introduced into the area after proving successful elsewhere.

A professional, especially one with extensive and varied experience, realizes that chemical choice and use are only two of many considerations in developing an effective control program. Weeds usually inhabit a turf site because they have been given a competitive edge by environmental conditions. Unless the cause of the weed problem is assessed, and on-site turf growing conditions improved, there is often a need for repeated (sometimes with significant detrimental effects) chemical applications. This is indiscriminate use of pesticides.

It seems that a brief review of some of the site conditions that influence turf weed problems is in order.

Soil Conditions

A soil of good physical quality will normally drain well, be well aerated and well suited for turf growing. Of course, good soils can be managed much easier than poor ones to produce a continually dense turf to deter weed invasion. Good soils will usually not compost badly. Compacted soils often have their own particular prostate knotweed and goosegrass weed problems. Poorly drained, wet soils are often inhabited by annual bluegrass and nutsedge, and dry sites often provide an acceptable habitat for kochia and quackgrass. The better the soil quality after construction or the better it can be made or maintained under existing turf, the fewer the weed problems, and the easier it is to keep them in check.

A soil of good chemical quality can produce a better turf than one of poor quality. Soils that are quite acid or alkaline, or have notable nutritional deficiencies - N, P, K, Fe, etc. - or excesses are quite likely to have serious weed problems. In drier climates accumulated soluble salts can have dramatic detrimental effects on turfgrass. This allows for the invasion of salt tolerant weedy plants. Weeds that tolerate high acidity include red sorrel and dandelions. Nitrogen fertilization, even at moderately low levels, can thicken turfgrass stands dramatically. The most effective chemical (fertilizer) to employ in a weed control program is typically nitrogen - the turfgrass thickener. Phosphorus fertilization can cause turf seedlings to develop rapidly. This can reduce early stand weed problems. But improperly timed (in the spring), the P can help annual grasses, such as crabgrass, foxtail and barnyardgrass, dominate new plantings. Where soluble salts cause problems, squirrel tail barley and alkaligrass can decimate pure stands of Kentucky bluegrass, especially in sod fields.

Influence of Turf Grasses on Weeds

Most turf people have observed the dramatic decrease in weed population associated with increased turfgrass density. Weed population differences are especially noticeable when common types of Kentucky bluegrass, fine fescue and perennial ryegrasses are grown next to new, high density varieties.

Rainfall and Irrigation Effects

Annual weed problems vary greatly from one year to the next. These weeds can be quite troublesome in years with early, warm temperatures. Weeds such as crabgrass, foxtail and barnyardgrass, given an early start especially in warm season grasses, become highly competitive. A wet spring can cause the weeds to continue to develop rapidly. With an early start and good growing conditions weeds often become a major component of the stand by mid-summer. Since such conditions are difficult to anticipate, selective post-emergent annual grass control materials may be needed. A pre-emergent material might have been preferred, but there is often no way to predict the seriousness or the exact area of the problem early.

Irrigation practices frequently contribute to weed problems. Annual bluegrass and rough bluegrass usually get a strong foothold where overirrigation and heavy soils are a problem - near heads, in front of greens, near leaks, etc. In dry areas, from irrigation skips, bermudagrass, quackgrass and tall fescue often "take over". A good irrigation system with quality water and good drainage can be keys to producing a good turf with few weed problems.

Mowing Influences

Mowing practices, even with new low growing turfgrasses, can significantly affect weed problems. Generally a higher cut results in fewer weeds, and more frequent mowing creates denser turf. Also, mowing to keep annual weeds from going to seed can reduce future weed problems.

Disease, Insect and Animal Effects

Any agent that opens up the turf and leaves a place for weeds to grow will likely increase weed problems. Sometimes it is desirable to overseed after turf dies. If this is to be done, careful attention should be given to selecting a herbicide that will be safe to use on new seedlings, and/or selecting grasses that are likely to have fewer weed problems. With overseeding, the residual influence of previously used herbicides (often months) needs to be considered.

Shade Influences

Shade can dramatically reduce or increase weed problems. For instance, shady areas are often needlessly treated for crabgrass control. Wet shady areas are often invaded by annual bluegrass and roughstalk bluegrass. In such cases, as in many others, the decision must be made on the desirability of the plant cover. Frequently the cover, even if it is a weed such as moss or common chickweed, is preferable to bare ground.

Mechanical Control

This phase of weed control continues to receive little attention. Sod growers may occasionally hand pick a few dandelions, field bindweed and even Canada Thistle out of cut sod; or a golf course superintendent may, from time to time, use a pocketknife to gouge out a dandelion or chickweed plant from a green. In many countries with extensive labor supplies, hand weeding is still an important means of control. In the U.S. with our outstanding arsenal of herbicides, and with our present state of technology in turf weed science, there are very few weeds that cannot be satisfactorily controlled with chemicals.

Chemical Control

Increasingly we become aware of the many factors that influence chemical control success. The kind of applicator used, water quality, pesticide dilution, soil type, air and soil temperature, kind and age of weed, the kind of turfgrass, irrigation timing or rain following application, wind velocity, formulations, and chemicals to use usually receive some attention when developing a chemical control program. It is not

possible here to thoroughly discuss these **important** considerations in any depth. However, if we look at one of these (applicators) in detail, perhaps a better understanding can be had of developments that continually influence turf weed control decisions.

Pesticide applicator choice and proper use is very critical in getting the most out of any pest control program. During the last few years several innovative pieces of equipment have been introduced, and a few of these have found fairly wide acceptance in the turf industry. A wide variety of nozzles are available for use with the old conventional boom. These may be color coded, especially built to resist wear, etc. A major problem with boom applicators results from use of poorly selected nozzles, use of worn out ones, etc. Depending, of course, on the amount of use, boom applicators should be checked yearly or more frequently for problems. Roller and wick or rope applicators are useful tools in turf situations, especially where the weeds rapidly grow taller than the turfgrass. These applicators may be successfully used to take tall fescue out of Kentucky bluegrass and buffalograss, or to remove Canadian Thistle from tall fescue stands used for erosion control, etc. Micron and electrostatic applicators may not have quite the advantage on a flat turf surface that they do for trees, shrubs, flowers and other taller growing intermittent plantings. But, they certainly have use for turf situations, and as their use becomes more common, more innovative ways will be found to use them. Also, more attention will be given to developing formulations to match the applicator equipment.

Pesticide safety, whether referring to non-target plants, animals, or people, and effective pesticide use, is dependent upon knowledge of the pesticide. **The final word on use is the label. ALWAYS READ AND FOLLOW LABEL INSTRUCTIONS.**

Selective postemergent broadleaf weed control chemicals have been doing an outstanding job since World War II. 2,4-D has been very effective in controlling a wide array of broadleaf weeds. For several years 2,4,5-T was used to control some of the weeds that 2,4-D missed. Even with these two outstanding chemicals there were a few weeds that remained troublesome. But, with the advent of silvex (2,4,5-TP) some of these difficult-to-control turf weeds were brought into check. When dicamba became commercially available it gave the turf maintenance person something that was outstanding for clover, knotweed and chickweed control plus many more. MCPP was found to be effective on clover, knotweed and chickweed, but it was found to control only a very limited number of turf weeds. It was recognized early that MCPP could be used on bentgrass, and this gave many turf maintenance professionals something they needed. Recently 2 and 3-way combinations of 2,4-D, dicamba and MCPP have become standard materials for use on a very wide spectrum of weeds in most turfgrasses. Manipulating the amount of active ingredient in the mix has allowed this product to be labelled for use on bentgrass. Another herbicide, which is not new, but that could certainly play a more important role in turf management, especially for sodgrowers, is bromoxynil (Brominal and Buctril). This chemical can effectively control many young broadleaf weeds in newly planted grass.

Selective, preemergent annual grass control materials have proven very useful to turf growers, especially those in the transition zone. They have helped to successfully push cool season turfgrasses further south, but they are a tool of the trade, and their usefulness is proportional to the knowledge the user has about them. There are some rather

new (oxidizon-Ronstar) materials, and some that have been marketed for many years (DCPA-Dacthal). It is not possible to adequately discuss these chemicals here, but a few brief statements may be helpful in this "update".

DCPA has wide use in agriculture. It is used to control weeds in many vegetables, strawberries, nursery plants, flower beds, and other plant situations. The list of cultivated plants that DCPA is labelled for is quite lengthy. In addition to controlling crabgrass and several other annual grasses, it is used to control some very troublesome (purslane, creeping speedwell, etc.) broadleaf weeds.

Benfen (Balau) in granular formulations has been quite effective for the control of many (annual bluegrass, smooth and hairy crabgrass, goosegrass, watergrass and yellow and green foxtail) annual grasses. It has often been the choice for large area weed control including established Kentucky bluegrass sod fields.

Bensulide (Betasaw) is marketed under several different trade names. It has been widely used by commercial lawn maintenance companies for pre-emergent control of annual grasses. It can be used on essentially all turfgrasses including bentgrass, and it has been incorporated in many annual bluegrass control programs on golf courses.

Siduron (Tupersan) is another chemical that is widely used for selection, preemergence annual grass control in established stands of certain turf grasses. It is not for use on bermudagrass, and certain varieties of bentgrass. Unless a superintendent is **absolutely** sure of his variety of bentgrass, he should do some preliminary (small plot) checking at least a year ahead of incorporating this chemical into a weed control program. It has been known for many years that siduron could be used on new seedings (of some turfgrasses) to keep out certain broadleaf weeds and several annual grasses. As common as this knowledge is, sod growers come in every winter for a program review, and at that time they hear about this chemical for the first time. After trying it in the spring on new seedings many of them report back, with pleasure, in the fall of their successes. A person who lives in the Transition Zone (Crabgrass Belt) and makes spring seedings should certainly consider using this herbicide.

Oxadizon (Ronstar) is a "new" selective, preemergent chemical for annual grass control in established turf. It is receiving a great deal of attention for, among other things, its effectiveness in controlling a difficult weed, goosegrass (silver crab).

Pronomide (Kerb) has proven quite effective for pre-and postemergent control of annual bluegrass in bermudagrass. Turf Kerb 50-W is not recommended for use on greens. Kerb has a protective clothing notice on the label.

Ethofumesate (Prograss) is a "new" herbicide for professional pre- and postemergent use on **certain** ornamental turfgrasses. From the technical Information Bulletin for ethofumesate - "PROGRASS Flowable herbicide (4.9 lb. ai/gal) is effective for use in the establishment of, or on established perennial ryegrass to control certain annual grass and broadleaf weeds". As this chemical receives further testing its uses will likely expand to counter some new serious turfgrass weed problems.

Selective, postemergent annual grass and sedge control materials can be quite effective tools for killing growing weeds in **certain** turfgrasses. AMA, DSMA, MSMA and a few other organic arsenical "summer crabgrass" control materials may prove effective in cleaning up turf infested with crabgrass, barnyardgrass, goosegrass, etc. Repeat (2 or 3) applications of these chemicals will likely be necessary for

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satisfactory control. These materials have been especially helpful to sod growers needing to get a spring seeded, weed infested crop to market in the fall.

Bentazoun (Basagran) is labelled for postemergent control of yellow nutsedge in many different turfgrasses. As always, directions given on the label for herbicide use should be followed closely.

Non-selective, short residue herbicides have had rather limited use in the turf industry until fairly recently. Paraquat, a contact herbicide, provides kill of emerged annual broadleaf weeds and grasses and for top kill and suppression of perennials. Paraquat ties up rapidly in clay soils. Paraquat is a **RESTRICTED USE PESTICIDE**.

Glyphosate (Roundup, Kleenup) translocates to kill both roots and shoots. It is used in many ways on turf facilities. It has been used to chemically edge around headstones, near fences and roadways, etc. It has been used to take out undesirable plant materials, including old stands of turf, to allow for establishment of desirable turfgrasses. Work is currently underway to make commercially available mixtures of glyphosate with chemicals that will provide preemergent weed control. This or proper tank mixes could significantly extend the length of time between applications of glyphosates. Glyphosate ties up in soils, and few problems have been noted from movement from application site. However, "extreme care must be exercised to avoid contact of spray, drift or mist with green foliage, green bark or bark of trees established less than two years. Suckers or fruit of desirable trees, crops, plants or other desirable vegetation. Spray contact with other than matured bark on the main trunk can result in serious localized or translocated damage."

Other nonselective, short residue herbicides such as dalapon and cacodylic acid are used in turf situations.

Nonselective, long residue (soil sterilants) herbicides have been used in some turfgrass situations. These materials should be used, as every pesticide should, **strictly** as directed on the label. In urban situations the materials have caused some very serious problems when used by homeowners, and even by "professional" applicators. There seems to be a trend to use short residue, broad spectrum controls, in lieu of sterilants, in urban situations.

From the above it is quite evident that many factors enter into devising a successful turf weed control program. And, it is the role of the professional groundskeeper to understand and manipulate these many factors to get the best results, possible.

Jack D. Butler
Department of Horticulture
Colorado State University

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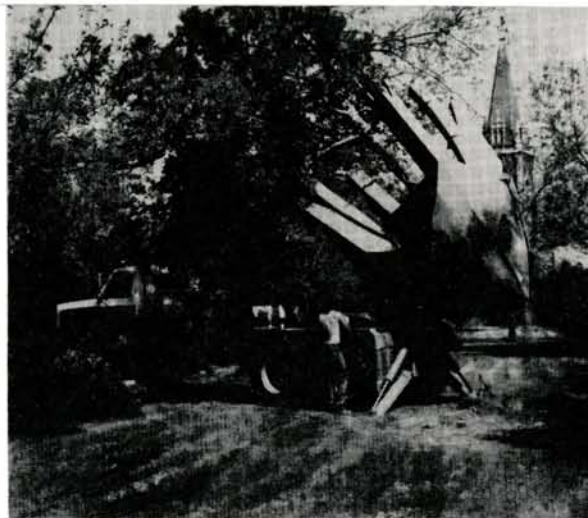
NORTH PALM BEACH, FL — A National Golf Foundation compilation of all two-year and four-year colleges and universities offering men's and women's intercollegiate golf is now available.

Cost for the Information Sheets is \$5 each, or \$8 for both the men's and women's lists. There are 1,169 schools on the men's list and 312 on the women's. The women's list also notes institutions offering financial aid.

"Due to the number of requests for this information and the apparent lack of it elsewhere, we felt there was a definite need for this Information Sheet," explained Annette Thompson, NGF director of education. "We plan to update these fact sheets annually and hope to add more categories each year."

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