

# How to Use New Pre-Emergent Herbicides in Turf

Developed mainly for agricultural use, pre-emergent herbicides offer unlimited opportunities for contract applicators. But with new preparations and new techniques come new problems. When to use a pre-emergent herbicide, and which one will work best, are questions which will face every CA sooner or later.

Action of pre-emergent chemicals takes place before seedlings have emerged from the soil, so that seeds are destroyed while they are sprouting. Several products have been cleared for the market, and many more are being tested for performance.

Weeds are fast growing and maturing. Many times post-emergent treatments are applied too late. Such "late" applications destroy grown weeds, but the seeds will already have been shed for the following year. It's like "closing the barn door after the horse is gone." Proper use of a pre-emergent herbicide practically assures that there will be few if any susceptible weeds left that year. Obviously, chemicals for pre-emergent control must be applied well before any weeds are seen. Geographical differences and weather conditions affect the time of germination, so application time will not be optimum for all applicators during the same months.

As opposed to conventional post-emergent treatment, pre-emergent chemicals kill unseen weed pests. Differing from soil sterilants, and nonselective post-emergent preparations, the action of pre-emergent herbicides is highly selective. That is, pre-emergent herbicides kill only sprouting seeds of weeds without hurting established turf. In this way, desirable turf is left unmarred by crabgrass and other unsightly weeds. Pre-emergent treatment may be recommended for any contract that calls for prevention of weeds: lawn turf, golf courses, highways, cemeteries, parks, etc.

For this discussion we shall cover only generalities about the chemicals, and specifics about their use for controlling crabgrass (*Digitaria sanguinalis* and *D. ischaemum*, hairy and smooth

crabgrass respectively) on turf, although most of these new chemicals control many noxious weeds.

Some of the chemicals shown to be satisfactory for crabgrass control are: Bandane (Velsicol); Dacthal (Diamond Alkali); Diphenatrile (Elanco); Dipropalin (Elanco); Tricalcium arsenate (Chipman); Trifluralin (Elanco); and Zytron (Dow). All of these do the job they were designed to do, but in many cases they are designed to do a variety of jobs.

Results of granular applications

*Two problems face contract applicators who are turning more and more to pre-emergent chemicals for turf jobs, this article points out. First, new chemicals must be understood and evaluated. Second, customers must be persuaded to buy control of weeds they can't see.*

are more consistent than liquid treatments, and granules are easier to handle and apply. There is less danger of making a mistake than CAs may find when mixing a concentrate in water. Mistaken mixtures may result in a strength of application greater than recommended. Granular application, provided the recommended rate of pounds per acre is followed, safely assures the operator of a good job.

#### **Fertilizer Cheap P-E Carrier**

In general, all the pre-emergent herbicides are compatible with fertilizer and may be applied over or with such a soil builder. In addition to being one of the cheapest carriers, fertilizer helps form a tight, solid mat of grass, which further prevents weed infestation. One point should be noted at this time. Excess phosphorous may tie up or block the action of herbicides, so if the fertilizer contains phosphorous, test phosphorous content of the soil to avoid over dosages which might affect the herbicide.

Contract applicators, then, should know the advantages of pre-emergent control, the various herbicides involved, and the situa-

tions in which these chemicals are used.

Pre-emergent control has many advantages over post-emergent control. When chemicals are properly applied at the beginning of the growing season, competitive weeds do not spring up. Turf and ornamental nutrition is not impaired by unsightly weeds. When crabgrass is left in a lawn, "brown-out" occurs in the fall when crabgrass begins naturally to die out. When crabgrass is killed in the spring, there are no holes in the

lawn such as are left by this weed when it dies in the fall.

Pre-emergent treatment is economical because, in most cases, less chemical is required. It is also a laborsaving method because normally only one treatment is necessary for complete seasonal control. During germination, tender young shoots are in a very active state of development and growth. At this time they are most susceptible to herbicide action. Chemicals released from the surface of granular carriers by rain or irrigation, or applied in solution, attack these weed sprouts while they are still in the soil, thus eliminating later trouble and expense.

#### **P-E Less Likely to Harm Turf**

Since pre-emergent herbicides are selective for seeds and seedlings, turf injury by chemicals is not a problem for most grasses when pre-emergent chemicals are used in the spring. Also, since pre-emergent chemicals do not act on surface contact there is no danger of injury to adjacent shrubbery.

Exact species of turf grass should be determined before treatment is begun, because some are

more sensitive to herbicidal treatment than others. Also, the exact safety margin of each chemical must be fully recognized because some herbicides affect these delicate grasses more than others. If the species cannot be determined, a test should be made on a small portion of the grass to ascertain the plant's reaction. Some turf grasses which may be expected to react unfavorably to treatment are fescues, bents, and bluegrass.

Species of the infestation should also be determined because some of the pre-emergent herbicides are not effective against all of the grassy weeds, and few of them are effective against broadleaved weeds. No guarantees for complete weed removal should be made until the capabilities of the chemical and the target weeds are known.

Size and scope of the contract, along with available equipment, will help decide whether to use a liquid spray of, for example, 5 gallons of active ingredient per acre, or a granular type which may require 400 lbs. of active ingredient per acre.

#### When to Apply P-E Chemicals

Some pre-emergent herbicides work best when applied in spring; others produce optimum results when applied in fall. A few will work satisfactorily at both times. This fact gives an operator a chance, while working on a fall job, to begin "booking" other customers for spring applications, if heavy infestations are noted. It follows that if pre-emergent herbicides do not prevent broadleaved weeds, an additional treatment with contact post-emergent herbicides, applied to broadleaves before they produce seed, will result in a satisfied, weed-free customer.

To work well, a pre-emergent herbicide must be with the seeds at germination time. Fine particles of chemical cling to the soil and contact seeds as they sprout. If the soil is too porous, the chemical may leach down too far and be ineffective. A heavy soil can usually hold a liquid treatment satisfactorily, but on a more sandy soil a granular preparation may work better. A muck soil, high in organic content, may tie up the herbicide and more chemical would

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#### 908 PRO Stainless Steel Sprayer

Stainless steel tank, 2 gallon usable capacity. Smooth stroking seamless brass pump easily removed for fast filling. Positive dripless nozzle shutoff. 4 ft. vinyl core hose, braided stainless steel wire cover and vinyl outer casing. Shut-off has easy clean Monel strainer. 9" angled extension with fan-pattern nozzle quickly removed from shut-off valve housing.



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be required for effectiveness. This shows the necessity for knowing soil types.

Following is a discussion of some important new pre-emergent herbicides.

#### **Bandane**

Bandane (polychlorodicyclopentadiene) as a granular formulation applied in a pre-emergent treatment gives good crabgrass control. At 30 lbs. per acre, Bandane has shown no injury to established turf grasses. Of crabgrass materials, Bandane is one of the least phytotoxic to turf. Tests indicate that when used at crabgrass control rates, Bandane will also control ants and grubs in the soil. This chemical is safe to handle according to mammalian toxicity studies.

#### **Dacthal**

Dacthal (dimethyl 2,3,5,6-tetrachloroterephthalate) is sold in various concentrations and on a number of carriers for different uses. It has a recommended application rate of 10 lbs. active ingredient per acre, and gives good pre-emergence control of crabgrass, foxtail, witchgrass, purslane, common chickweed, carpet weed, and lambsquarters. Residual effects of Dacthal often last through one season, it is claimed, but the compound does not retard germination of desirable grass seed if reseeding takes place after about 5 weeks. It is also said to be safe for use in proper amounts on seedling grasses of freshly landscaped areas given the same safety margin of 5 weeks.

#### **Diphenatril**

Diphenatril (diphenylacetone) is available as an 11.5% concentration on a vermiculite carrier, or a 5.5% strength on a fertilizer carrier, as well as other formulations. Applied at 30 to 40 lbs. active ingredient per acre, diphenatril prevents germination and growth of crabgrass, goosegrass, and green or yellow foxtail. It is not effective against seedlings of broadleaved weeds, however. Established bluegrass, fescue, bentgrass, zoysia, Bermuda grass, centipede grass, and St. Augustine are all tolerant to diphenatril.

#### **Dipropalin**

Dipropalin (N,N-di-n-propyl-2,6-dinitro-4-methyl aniline) is re-

lated to trifluralin, but differs by three flouride atoms. Applied at 4 to 6 lbs. active ingredient per acre, it has given excellent control in tests of crabgrass, yellow and green foxtail, and goosegrass. It is considered safe for use on freshly planted landscapes.

#### **Tricalcium arsenate**

Basic rates for *tricalcium arsenate*, using a 48% granular concentration, are 18 lbs. per 1000 square feet. If a 73% concentration is used, only 12 lbs. per 1000 square feet are needed. This compound, researchers have said, may have a residual effect of up to one year. In addition, tricalcium arsenate will also control grubs and worms in the soil, killing most of them. Tricalcium arsenate should be applied when foliage is dry. If the chemical is dissolved by moisture on leaves, it may act as a contact herbicide and damage the plant. Arsenicals must be used cautiously because they are toxic to other organisms.

#### **Trifluralin**

Trifluralin (N,N-di-n-propyl-2,6-dinitro-4-trifluoromethyl aniline) concentrations vary, but it is usually obtained on a vermiculite carrier, and is applied at 1.6 lbs. of active ingredient per acre. Trifluralin is not recommended for pre-emergent control on freshly planted areas. This compound will control all the weeds mentioned for its relative, dipropalin, without injury at recommended rates, to established grasses such as bluegrass, bentgrass, Bermuda grass, zoysia, and St. Augustine. This compound also has a good residual rating.

#### **Zytron**

Zytron (O-(2,4-Dichlorophenyl) O-Methylisopropylphosphoramide) is formulated as a 4.4% concentration on an organic carrier, among others. The granular form of Zytron, applied at 15 lbs. active per acre, has shown to work as well on turf as the liquid form of the same chemical. Zytron has a residual effect of several months, but it may delay germination of fresh turf seed. This results in what researchers call "excellent" control on established turf. Caution must be observed with Zytron in that it has an effect upon the sensitive grasses. In ad-

dition to crabgrass, Zytron can control foxtails, barnyardgrass, goosegrass, pigweed, purslane, smooth and mouse-eared chickweed, henbit, and oxalis. Zytron can be applied in winter or early spring. Zytron has been researched and used commercially for more than four years.

Researchers advise that turf be established about 5 weeks before any seeded landscapes are pre-treated for crabgrass with the above chemicals. In all cases mentioned here, label directions will be the best guide to successful pre-emergent treatment.

Pre-emergent weed control is new and it needs more advocates. They will come when experience and information based on this efficient type of treatment is more widespread.

One of the major problems still to be solved, and it has nothing to do with technology, is to overcome customer apathy towards buying control of weeds they can't see. But when this idea is sold successfully, contract applicators will find many pre-emergence applications can be made in winter or spring when business might otherwise be slow.

### **Changes Mark New Century Pump**

A stainless steel shaft, extended so power take-off slides over it with greater support, is one new feature of the 1962 Century 8-nylon-roller spray pump, manufactured by Century Engineering Corp. With this extension, the shaft can also be used for pulley or motor operation, the manufacturer says.

Price reductions in the 8-nylon-roller pumps mean PCOs can get increased gallonage output, increased agitation, and increased pressure, for prices comparable to 6-roller pumps, Century claims.

PCOs desiring more details may write Century Engineering Corp., Cedar Rapids, Iowa.

### **Carter Guide Available**

Carter Insecticide & Chemical Co. has a complete guide on its soil fumigant applicators available to interested CAs. Applicators, kits, methods, and mixtures are described. For a free copy, write to P.O. Box 209, Wallace, N. C.