Using Turfgrass Growth Retardants

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Textbooks on turfgrass management define turf as a covering of mowed vegetation, usually a turfgrass, growing intimately with an upper soil stratum of intermingled roots and stems. The most important element of this definition is the fact that the turf is mowed. There are no other plants that can withstand repeated mowing at low heights of cut. Because we mow turf so often, mowing is easily the largest part of the maintenance budget and the thought of reducing the amount of mowing through the use of growth retardants is quite appealing. I want to present you with information that will help you make the decision as to whether or not you should be using a turfgrass growth retardant. I will address the questions of what growth retardants are, where they can be used, and how to use them.

Growth retardants are a subgroup of a class of chemicals called growth regulators. Growth regulators are naturally occuring or man-made substances that control the growth of plants. Many people use the term plant hormones interchangeably with the term growth regulators. Examples of growth regulators are gibberellins, auxins, and cytokinins. These three chemicals regular various aspects of plant growth such as seed germination, rooting, and cell division. The herbicide 2,4-D can influence plants in a similar manner as does indole acetic acid which is a naturally occuring auxin. Growth retardants, as the name implies, cause the growth of the turfgrass plant to be restricted and thus, reduce the need for mowing.

The main growth retardants that have been used on turfgrass stands are maleic hydrazide (MH) (sold as MH-30 or Maintain 3), chlorflurenol (sold as Maintain CF125) and mefluidide (sold as Embark). In addition, a mixture of maleic hydrazide and chlorflurenol was sold as Po-San by Mallinckrodt. Eli Lilly, Monsanto, and Imperial Chemical Industries are experimenting with growth retardants and may be releasing compounds in the next few years. Maleic hydrazide was the first retardant to gain commerical acceptance and has been joined and in many cases replaced by mefluidide. Research has shown that mefluidide is more effective than MH in retarding growth but that in some cases the appearance of the stand is more adversely affected. The experimental materials appear to be better than mefluidide and MH in both their effectiveness and in how they influence stand appearance.

An understanding of the nature of turfgrass growth will immediately allow one to decide if he has areas on which a turfgrass growth retardant can be used. A turfgrass stand is a dynamic community of plants in that there is continual death of existing tillers and replacement by new tillers. On a given plant, there is replacement of old leaves by new leaves, and growth of rhizomes, stolons, and roots. The overall health of the plant is a direct reflection of its ability to grow.

Recovery from diseases, insect damage, wear, and stress injury is dependent on growth. Right away, you can think of areas where a growth retardant can not be used. Athletic fields, putting greens, golf course fairways, home lawns, areas that receive foot traffic, and high visibility areas such as those in front of corporate headquarters should not be treated with growth retardants. Areas that could be treated with growth retardants include roadsides, embankments and areas difficult to mow, and

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low maintenance areas around industrial complexes. Both lists may change as new materials become available.

Two special uses of growth retardants are currently being investigated by researches at several universities. This is the use of mefluidide to suppress seedhead production on annual bluegrass and application of growth retardants to help reduce plant water use. By preventing annual bluegrass from forming seedheads, additional food that would be normally used to produce seed is available for root growth. Research at Ohio State has shown that the root system of annual bluegrass declines sharply as seedheads are formed in early summer. Researchers in Nebraska and Texas have reported lower evapotranspiration rates for turf treated with growth retardants. This is related to the reduced growth rate and the concommitant decrease in the need for water.

Let's say that you have an area that might be suitable for treatment with growth retardants. There are some things to consider regarding their use. The first and foremost suggestion I have is that, after you have read the pesticide label, experiment by treating a small area so that you know what to expect. I could show many charts and tables from research projects across the country where the color, density, and quality of turfs treated with retardants has been evaluated but they would not convey the picture of what turf looks like after it has been treated with a growth retardant. Only in the case of areas that are extremely difficult or dangerous to mow, would I recommend using a retardant without first experimenting. The turf, quite simply, has a different appearance. If you have gotten along without growth retardants up to now, then there is no reason to rush into the use of these materials. A conservation approach is the best approach with retardants.

The remaining considerations will apply specifically to mefluidide since it is the main commercial product used to retard turfgrass growth. Mefluidide must be applied to green vegetation meaning that the first spray is made in early spring after the grass has started growing. The material should be applied with an accurately calibrated sprayer to avoid uneven appearance from either over and under application of material. If there are any weeds present, a broadleaf herbicide should be included in the tank mix. Mefluidide selectively inhibits the growth of the grass so that without the inclusion of a herbicide, you will end up with giant weeds. The treated area can be mowed one week after treatment to improve the uniformity of the stand. Mefluidide will retard the growth of the plants for four to eight weeks depending on the weather with less retardation during wet years. After the material wears off, there will be a post inhibition stimulation of grass growth which is a burst of growth followed by a resumption of the normal growth rate.

Researchers at the University of Maryland have applied mefluidide to a mixed Kentucky bluegrass-red fescue stand two times per year for four consecutive years. They reported a serious problem with crabgrass encroachment into the treated turf. They also reported that the turf had an unacceptable appearance during the summer months. The turfgrass stand did recuperate, however the year after the applications were discontinued. This would lead to the recommendation that the turf should not be treated continously with a retardant but should be allowed to have periods of normal growth.

The use of mefluidide to suppress seedhead formation on an-

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nual bluegrass requires critical timing to insure that the seedhead has not already formed. The rate for seedhead suppression is also lower than that used for normal retardation of Kentucky bluegrass. Special care should be exercised when using mefluidide for this purpose.

The use of retardants will not doubt increase in the future as newer materials become available. In summary, the use of retardants should be considered on areas that lend themselves to slow growth such as roadsides and difficult to mow areas. The applicator should take special precautions to insure a uniform application of material. Finally, don't be afraid to experiment with these materials before spraying large areas.

Sun Care Do's and Don'ts

DO try to stay out of the sun between 10 a.m. and 2 p.m. — when the sun's radiation is strongest and most damaging.
DON'T expect sunburn to turn into suntan — contrary to popular belief, getting red and burning actually inhibits the tanning process.
DO tan gradually — the tan you build slowly without burning lasts longer.
DO use the Sun Protection Factor system — multiply the number of minutes you can sun unprotected without burning X the SPF number of any product to get the number of minutes you can sun without burning using that product.
DON'T ever use a sun reflector — it intensifies the sun's damaging effects.
DO count swimming time as sun time — burning rays penetrate water.
DON'T expect a wet t-shirt to block the sun's burning rays — it is only 20 to 40% effective. Generally, whatever you can see through, the sun can burn through.
DO change position often — to balance skin's sun-exposure and to ensure a more even tan.
DO protect hair from the sun's drying effects with a scarf or hat. Shield eyes with dark-tinted sunglasses to help prevent wrinkles caused by squinting.
DON'T assume that fog and clouds will block ultraviolet radiaiton — 50% of the ultraviolet rays get through with total cloud cover. 100% penetrate on a hazy day.
DO remember — perfume and sun don't mix. The combination can cause a photosensitive skin reaction.
DON'T count on a beach umbrella to protect you from the sun — burning rays can reflect off the sand and onto your skin.
DO apply protection over suntanned skin — ultraviolet rays can penetrate even the darkest base tan.
DON'T forget — birth control pills make some women more prone to increased pigmentation. Watch out for darker, mottled areas of skin on the face; they require total sunblock protection.
DO count outdoor spot time as sun time — use sunscreen protection when playing tennis, golfing or sailing.
DO wear sun protection when you ski — high altitudes expose your skin to stronger, less filtered sun. Snow reflects up to 85% of the burning rays.
DO check with your doctor before sunning if you are taking **any** medication — certain types may cause photosensitive skin reactions.
DON'T ever sunbathe for more than 2 hours — no matter how tan you are or how much sun protection you are wearing.