This herbicide will self-destruct when its mission is accomplished.

Balan stops weedgrasses for months... and is naturally broken down. No fear of building up harmful residues. You've probably conducted your share of herbicide tests. Maybe you've seen some chemicals wash out before the job was done. But there's something worse: the herbicide that oversticks its welcome.

Balan won't hurt you either way. Won't quit prematurely. Won't stick around after its weed-control mission is accomplished.

Balan breaks down gradually. It is naturally degraded by chemical means and soil microorganisms over a period of months. Applied as directed, repeated applications won't damage established turf. And there's another consideration. Balan contains no poisonous arsenic, mercury or lead to endanger employees or golfers, an important safety factor.

But while it's working, goodbye, weedgrasses. Make no mistake, Balan stays put for months, stopping annual weedgrasses as they germinate. Poa annua, crabgrass, crowfoot (silver crabgrass or goosegrass)—most major troublemakers. On northern (cool season) turfs, one application gives season-long results. On southern turfs, two applications may be required.

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Speed is the answer. If you're topdressing with tediously hand-screened material, you're probably paying an extra five dollars a yard for a dressing that still brings complaints from golfers. Sticks and stones may hurt your reputation, and clog up your spreader, besides. Golf course Superintendents who've gone over to Royer Powerscreening are reporting a real drop in cost of this important maintenance item. Simple arithmetic tells you that a Royer Powerscreen, making payments on itself at five dollars (or more) a yard, can bring almost immediate relief to the maintenance budget bind.

Let a Royer distributor show you that what goes up can come down...meaning, of course, the high cost of topdressing. And he'll show you how a Royer Powerscreen can be put to work on short notice, and work efficiently for an hour or a day at a speed you wouldn't have believed.

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(Continued from page 19)

number of stomata to seriously restrict the photosynthetic process.

A significant reduction in shoot growth was evident at the higher PMA concentration used in the study. The authors indicate that this is a direct phytotoxicity to the leaf tissue rather than the indirect affect of growth reduction caused by a restriction in the photosynthetic process. A small reduction in photosynthesis caused by a restriction in carbon dioxide movement into the leaf would not be critical in high quality turfs as long as sufficient carbohydrates are being synthesized to maintain the existing tissues and to provide an adequate recuperative potential. Thus, a certain amount of shoot growth reduction is not objectionable since it will reduce the mowing requirement and frequency of irrigation.

A potentially more serious problem associated with the use of a stomatal-closing antitranspirant is the possible loss of the vital cooling process of the leaf which will result from a reduction in transpiration. The transpirational process is a vital cooling mechanism in turfgrass leaves during periods of heat stress. If PMA should close sufficient stomata to seriously impair the leaf cooling process associated with transpiration, leaf temperatures can increase to potentially injurious levels quite rapidly. Studies concerning this potential disadvantage associated with the use of stomatal-closing antitranspirants are lacking. Thus just how important such a factor is is not known at this time. It is likely that a sufficiently low concentration of PMA could be used which would provide a significant reduction in the rate of water loss and yet not seriously restrict the transpirational cooling mechanism. However, the specific rates of PMA application at which this is achieved cannot be determined by the available data.

The duration of effectiveness of an antitranspirant and the resultant
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The fine particles can be suspended in water to penetrate the closely knit turf and eliminate mower pickup. Compatible with pesticides and other fertilizer ingredients, Powder Blue can be sprayed as a part of the greens maintenance program.

Use of Powder Blue is especially recommended in the summer months when greens care can be so critical...because it's nonburning, laborsaving, and gives uniform coverage.

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The ideal grass for tees, approaches and collars. Takes short cut. Grows upright, gives better support to ball. Resistant to leaf spot, mildew, rust and stripe smut. Develops less thatch. Greens up earlier, stays green later.

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And Warren research has now made available the new grass, A-20, with the same high quality, for tees and aprons of greens. A-20 has been tested and rated excellent or superior by leading universities.

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GROWTH AND CARBOHYDRATE STORAGE OF THREE POA PRATENSIS L. STRAINS AS INFLUENCED BY TEMPERATURE.

V. B. Youngner and F. J. Nudge
(from the Department of Agronomy, University of California at Riverside, Riverside, Calif.)

The objective of this study was to investigate the effect of temperature on the shoot density and total available carbohydrate content of shoot bases of three varieties of Kentucky bluegrass: (a) Merion, (b) 0217 Fylking and (c) Newport. The data was collected after growing eight weeks at a given temperature regime and maintained at a cutting height of 1.6 inches.

Distinct differences were evident among the three Kentucky bluegrass varieties in terms of temperature effects. Merion and
Keep your entire green, green...
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Are the high spots on your greens dry spots in hot weather? Are your greens hard and compacted? Do your club members complain about ‘no-bite’ greens? Then you need the Ryan Spikeaire. It’s the power disc spiker for turf care during hot, dry summer months. It is recommended for use particularly on undulating greens where moisture runs off high spots. It’s these high spots that become hard and brown. Spikeaire will help you prevent that.

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The total available carbohydrate content found in the base of turfgrass shoots was significantly lower for Newport at any given temperature than for either Merion or 0217. This investigation also showed that the lowest level of total available carbohydrates occurred at the temperature which resulted in the greatest amount of shoot growth.

Comments: The results of this study indicate that Newport is better adapted to cooler temperatures, whereas Merion and 0217 Fylking are better adapted to warmer conditions as measured by the shoot density and level of reserve carbohydrates. The results of this paper suggest one factor which may contribute to the better adaptation of Merion to warmer climates in comparison to other Kentucky bluegrass varieties. It also suggests that 0217 Fylking may produce a similar response.

The measurement of total available carbohydrates in turfgrass tissues is an important indicator of the overall vigor, rooting depth and recuperative potential of the plant. Turfmen should attempt to develop cultural practices which will maintain a medium to high level of carbohydrate reserves at all times. In this paper the lowest carbohydrate level occurred at the highest rate of shoot growth. Other factors which tend to deplete the carbohydrate reserve are (a) an excessively high nitrogen fertility level or (b) severe defoliation of the shoots, due to either an excessively close cutting height or an excessively long interval between mowings.

More studies of this type are badly needed in order to obtain a more detailed understanding of the proper adaptation and use of the turfgrass varieties currently available. In the past most studies have been devoted to comparisons between species such as bentgrass and bluegrass. With the increased number of researchers working in the turfgrass area more effort will go into the responses of varieties within a species.

Other papers of interest:
Growing zoysia turf in Kansas is a plastic-pipe cinch.

"Ethyl" 6" and 8" Bell:Ring PVC pipe.

Lawrence, Kansas—home of the Alvamar Hills Golf Club—is in a region notoriously difficult for growing stable golf turf. Summers are hot, windy, often humid. Winters are chilly with little snow.

Yet, starting from scratch, Superintendent Mel Anderson was able to build springy zoysia fairways and tees—the first in the region—in less than a year's time. And he credits his good results to precision watering by his Toro Moist-O-Matic irrigation system—installed with "Ethyl" PVC Bell:Ring pipe in sizes through 6".

"We've used galvanized, asbestos cement, other conventional materials, and other PVC pipes. But," he added, "after three years 'Ethyl' Bell:Ring pipe is more maintenance free than any pipe used in the past."

Four years ago, up-to-date irrigation systems began using 6" Bell:Ring PVC pipe with integral bell gasket sealed joints. In 1969, 8" Bell:Ring eliminated the need to use archaic piping materials in modern irrigation systems.

Functioning as a flexible conduit, "Ethyl" PVC Bell:Ring pipe offers superior flexural strength, which is essential where bad laying conditions are encountered in which some conventional materials break up and shear.

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Write us about Agrico's Custom-Tailored Golf Course Program. Maybe we can make your dream come true.
by Fred V. Grau

ANSWERS TO TURF QUESTIONS

Still hope for real grass

Something quite unusual happened at the 1970 Penn State Turfgrass Conference. Dr. Joseph Duich, leader of turfgrass research and resident teaching, was handed a check for $1,800 during post-banquet ceremonies. Money for continuing research and teaching in itself is not unusual. The significant fact is that the money came from 55 turfgrass winter course students who had finished their course work and have become golf course superintendents in 16 states and Canada during the past 11 years.

Frank Dobie, Sharon Club, Akron, Ohio, and Tom Burrowes, The Playboy Club, Lake Geneva, Wis., took the lead in soliciting funds from fellow graduates. “We wanted to show our appreciation for the great start we were given in turfgrass work,” they said. Also, “We hope to make this an annual contribution.”

Here, then, is the new breed of golf course superintendent. They have a fresh, forward outlook, bridging the gap between the “old-timers” who had no chance at a formal education and the new generation who think for themselves. These young men accept their responsibilities as a challenge, not a chore. True, the job gets tougher every year and mistakes will be made, but the same mistakes very likely will not be made a third time. These alert thinking young men will figure out a way to do the job better—not try to find an easy way out.

In their course work these men were not given all the answers. They were taught to evaluate problems for discovering the answers. We believe that with a continuing program like the one started by Dobie and Burrowes, turf students in the field in commanding positions will help to motivate further those who soon will be on the firing line. If each graduate elects to make a substantial annual contribution, the benefits would be incalculable. The turfgrass world would then have greater assurance that qualified superintendents and turfgrass managers would carry on the work of giving everyone beautiful real grass for everyone’s benefit and enjoyment.

Q.—We were planning to attend the Turfgrass Field Day at Penn State last fall and also participate in the dedication of the Joseph Valentine Turfgrass Research Center. Both were canceled rather abruptly. Are there any plans for the future for dedicating the Valentine Memorial?

A.—At the most recent meeting of the Valentine Memorial committee (Steiniger, Duich, Mascaro, Shuman, Miller, Grau) at Pine Valley GC on November 7th, it was decided to plan the Memorial Exercises and Dedication for Wednesday to Thursday, June 24 to 25, 1970. There will be an abbreviated Spring Turfgrass Field Day also. Mark your calendar and plan to attend. Those who cannot attend may receive a souvenir Valentine Memorial program by requesting one from Valentine Memorial, Box 324, State College, Pennsylvania 16801. Contributions are not being actively solicited, but will be accepted.
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