AMERICAN LAWN APPLICATOR

May/June 1981
Volume II, No. 3

Close-up of fall brown patch

Winter brown patch

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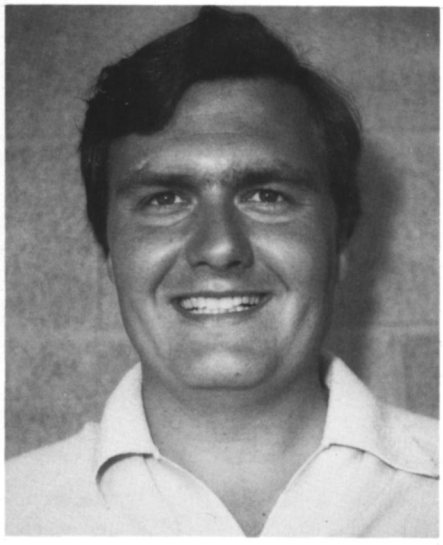
Nitrogen Fertilizers

by Norman W. Hummel, Jr., Graduate Assistant, Pennsylvania State University



A native of Buffalo, N.Y., Norman W. Hummel, Jr. is a graduate research assistant and doctoral candidate at the Pennsylvania State University. He received his B.S. in Agronomy from New Mexico State University (1977) and his M.S. in Agronomy from Penn State (1980). Norm's chief turfgrass interests lie in evaluating nitrogen sources for turfgrass fertilization.

It's spring, and you're making your first visit to a new customer's lawn. The thin, discolored appearance of the turf is clearly a symptom of neglect. Because this is your first visit, you routinely spray a pound of soluble nitrogen per 1000 sq. ft. to the starving lawn. A week later an ecstatic customer calls to thank you and to tell you that in all the years he has lived at this house the lawn has never looked better. He is one happy customer!

Although this story is fictional, it is a common occurrence in the lawn care business. Nitrogen is required by plants in larger amounts than any other essential plant nutrient. It is also the most limiting and must be supplemented with fertilizer applications. It is no wonder that there is such a dramatic improvement in a customer's lawn after you apply nitrogen fertilizer.

The fertilizer the lawn applicator chooses and how he manages it may determine if he retains a customer next year. There are dozens of fertilizer formulations on the market, each having its own release characteristics. For example, soluble materials such as urea, ammonium sulfate and ammonium nitrate, the cheapest fertilizers per pound of nitrogen, may cause foliar burn if not watered in or if applied at the wrong time of the year. Natural organics such as Milorganite and other activated sewage sludges have low nitrogen analyses and a low percentage of readily available nitrogen. Also available to the lawn applicator are synthetic organic fertilizers such as urea-form (UF) and isobutylidene diurea (IBDU), which have high nitrogen analyses but are expensive. Finally, the coated materials such as sulfur-coated urea have produced excellent results in the field; however, they cannot be applied with a spray gun.

The lawn applicator can learn much about a fertilizer by reading and understanding the label. Most slow-release fertilizers contain water insoluble nitrogen (WIN), the nitrogen that is not immediately available to the plant. The WIN, also called slow-release nitrogen, may become available to the plant during the growing season, and a portion may build up in the soil for several years. If a fertilizer contains WIN, the manufacturer is required by law to specify on the label how much WIN the material contains. For example, on the Milorganite label in Figure 1 we see that the WIN is 5.5%. This mean that 5.5% of the material is slow-release nitrogen while only 0.5% of the material is nitrogen readily available to the plant. The percentage of the nitrogen in the bag that is water insoluble is perhaps a more useful number to use. This is easily calculated by dividing the WIN by the total nitrogen and multiplying by 100 (Example 1).

Figure 1. Fertilizer label with guaranteed analysis for Milorganite (6-2-0).

50 Lbs. Net Weight
Milorganite 6-2-0 (Activated Sludge)
Minimum Guaranteed Analysis
Total Nitrogen 6.0%
5.5% Water Insoluble Nitrogen
Available Phosphoric Acid ($P_2 0_5$). 2.0%
Soluble Potash ($K_2 0$). 0.0%
Iron (Fe) 5.5%
The Sewerage Commission, Milwaukee, Wisconsin

EXAMPLE

$\frac{\text{WIN}}{\text{Total}} \times 100 =$ % of total N that is water insoluble

For milorganite:

$\frac{5.5}{6} \times 100 = 92\%$

Example 1 shows that 92% of the nitrogen in Milorganite is water insoluble, or slow-release nitrogen. Now that you know what WIN is, let's see how it relates to response in the field and how you use it when developing a fertilizer program.

This is the fifth year of a study at Penn State in which we are evaluating several nitrogen sources for turfgrass fertilization. When we began the study in 1977 we intended to characterize these materials, most of them slow-release fertilizers, so that we would have a basis on which to make recommendations. All the treatments were applied at a rate of 4 lb N/1000 sq ft/year, split into equal spring and fall applications. These rates are high for soluble nitrogen sources, but they were used to provide a uniform basis for comparisons among the fertilizers.

All the nitrogen in completely soluble fertilizers is in a form that is available to plants; therefore, there is no WIN. Turfgrass response to the soluble materials resulted in dark color and an excessive flush of growth lasting about six weeks after fertilization (Figure 2a). Applying high rates of soluble nitrogen to a lawn is undesirable because the turf will become more susceptible to disease and environmental stress, and the excessive flush of growth will require frequent mowing. Four light applications of the soluble fertilizers would have been a more suitable program, providing uniform growth and good color through the year.

Ureaform (Nitroform, 38-0-0) is a synthetic organic fertilizer containing 27% WIN, that is, 70% of the total nitrogen is water insoluble. Milorganite (6-2-0) is a natural organic fertilizer with 5.5% WIN, representing 92% of the nitrogen as water insoluble. The initial responses to ureaform (Figure 2b) and Milorganite were very slow, with good color being produced only in mid-summer. Because microorganisms in the soil are responsible for breaking down these materials and releasing nitrogen, poor

Figure 2. The effect of four nitrogen fertilizers on color ratings. (5 = darkest green, a rating of less than 3 was considered unacceptable color).

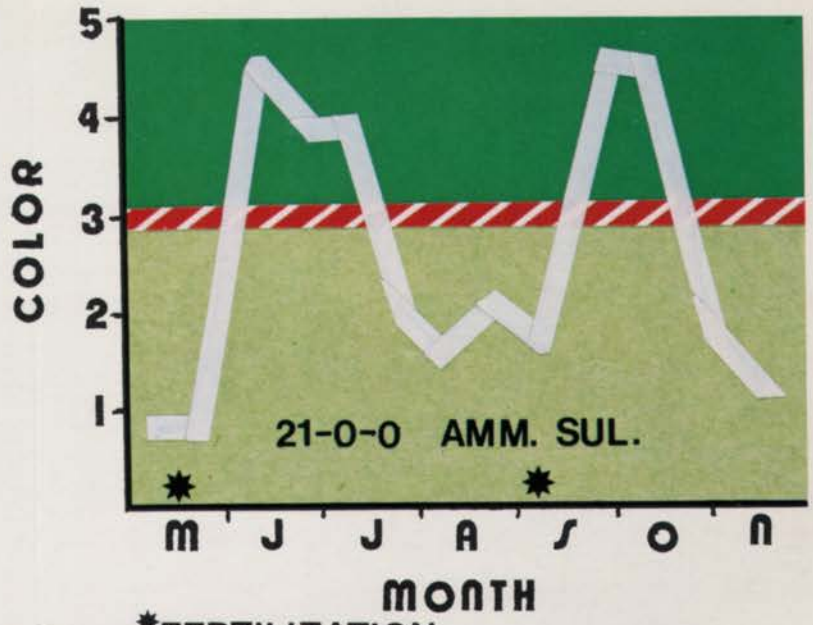


Figure 2a

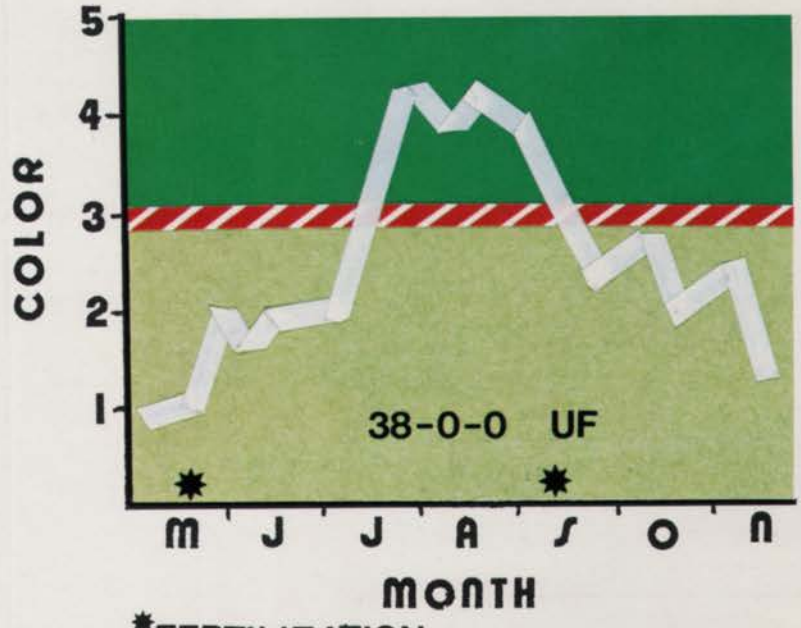


Figure 2b

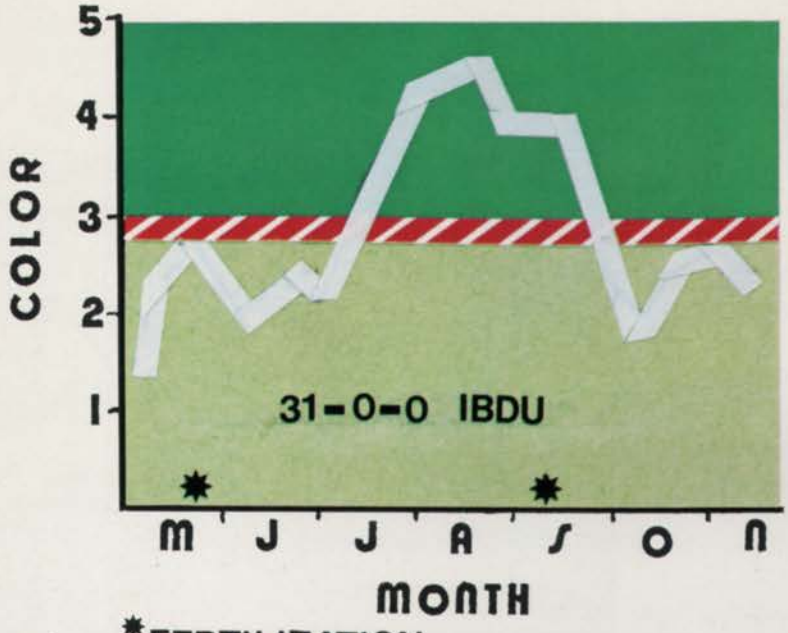


Figure 2c

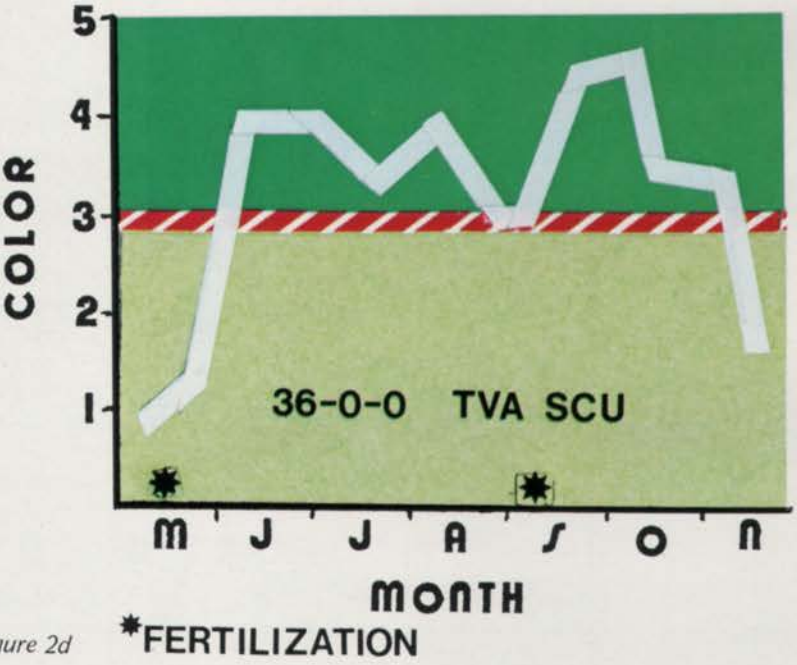


Figure 2d

color results in the spring and fall when soil temperatures are cool and microbial activity low. Supplementing ureaform and Milorganite with soluble nitrogen in the spring and fall will promote the production of quality turf through most of the season.

Ureaform is usually marketed with some soluble nitrogen mixed in the formulation. These fertilizers have a lower WIN than ureaform alone; therefore, they produce a quicker and more desirable response to fertilization. Because there is more soluble and less slow-release nitrogen in these materials, at least three applications of ureaform-soluble combinations are necessary to maintain a high quality lawn through the year.

A portion of the nitrogen in ureaform is very insoluble and may not become available to the plant for several years. Although this accumulation of nitrogen may produce beautiful results in the long run, some lawn care businesses with a large turnover may wish to use the ureaform-soluble combinations or another nitrogen source altogether.

Quick initial response with Methylene urea

Methylene urea, a nitrogen source similar to ureaform, is included in many of Scott's products. It is unlike ureaform in that the nitrogen is much more readily available. We obtained a quick initial response and good color for up to eight weeks after fertilization. Because of the short residual of methylene urea, three or four applications a year should produce excellent results.

Isobutylidene diurea (IBDU, 31-0-0) is a synthetic organic fertilizer containing 27.9% WIN. Release of nitrogen from IBDU is very dependent on water. The IBDU must first react with soil moisture before the nitrogen becomes available to the plant. Because the IBDU you applied is sitting in the thatch, it may take four to six weeks for this reaction to occur. As a result, there is usually a long delay after application

Nitrogen Fertilizers

before you get a response to IBDU (Figure 2c). This delay is an undesirable characteristic in the lawn care business because the customer expects immediate results. This delay can easily be corrected two ways: 1) proper timing of application and 2) using IBDU-soluble combinations. Proper timing of IBDU applications can produce excellent results. A sound program might include a late fall application to insure good spring color, followed by spring and mid-summer applications. IBDU is also sold in a 24-4-12 with 50% of the nitrogen from a soluble source. The soluble nitrogen in the 24-4-12 removed the delayed effect we observed for the IBDU alone. Because the slow-release nitrogen is diluted by the added soluble nitrogen, at least three applications of this material are necessary to insure good color all year.

Several sulfur-coated urea (SCU) fertilizers were evaluated, including two fertilizers containing SCU from the Tennessee Valley Authority (TVA) and four fertilizers containing SCU from Canada Industries Limited (CIL). Unlike other slow-release fertilizers, there has been no clear labeling practice accepted for SCU. Because the nitrogen in SCU is soluble, there is no true WIN; however, because of the sulfur coating, most of the nitrogen in SCU is slow-release nitrogen. Some labels have listed WIN. Others list controlled release nitrogen (CRN), which may be based on the total SCU present or the portion that does not dissolve in a 7-day laboratory test. From this lab test, the SCU is given a dissolution rate. The dissolution rate is the percentage of the nitrogen that will go into solution over a seven day period in the lab. The higher the dissolution rate, the faster the SCU releases nitrogen, and vice-versa. The SCU fertilizers

SCU was most valuable

in our test had dissolution rates ranging from 25% to 40%. It's easy to see why this controversy is keeping us all confused! One thing that is clear is that there was little difference in the sulfur-coated ureas we evaluated. Both the CIL SCU and the TVA SCU produced good color after fertilization and had sufficient residual nitrogen to maintain good color throughout the year (Figure 2d). Of all the fertilizers we evaluated, SCU was the most versatile. Sulfur-coated urea will produce excellent results under most fertilization schemes.

Both SCU materials were used in conjunction with soluble nitrogen in complete fertilizers. Although the SCU-soluble combinations produced a good initial response, there was not enough residual nitrogen to maintain quality turf through the summer. Use of SCU-soluble combinations may offer a cost advantage over the SCU-only fertilizers but will require more frequent applications to produce the same results.

Folian (12-4-4) and methylol urea (30-0-0) are two liquid fertilizers we evaluated in our test. The Folian produced a good flush of growth and color that lasted up to eight weeks after fertilization. It was an easy material to handle and had very good storage characteristics. Methylol urea also maintained excellent growth and color up to two months after fertilization. Some long-term storage problems may be experienced with methylol urea and the lawn applicator should not purchase any more of this material than he would use in a season.

Before selecting a nitrogen source the lawn applicator must consider how the material is going to be applied; as a spray or as a dry material. Ureaform applied as Powder Blue has been successfully used in a spray tank by many lawn care companies. IBDU is also available in a small particle size and has been used in a spray mix with good results. Soluble nitrogen sources such as urea (45-0-0), will easily dissolve in the tank and produce excellent results at a low cost to you. Liquid methylene ureas such as Hawkeye's Formalene quick greening but have a lower burn potential than urea. If your lawn care business uses dry fertilizers, several nitrogen sources are available in a variety of formulations.

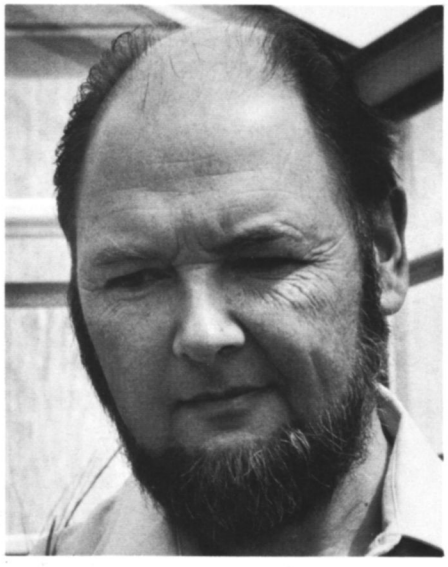
Whatever nitrogen source you decide to use, read the label, and use the information available to you to develop a program that is convenient and efficient for you and pleasing to your customers.

^ ^ ^

Part 2

Bluegrass Energy Distribution

by Richard J. Hull



Richard J. Hull is a Professor of Plant and Soil Science at the University of Rhode Island. He received his B.S. and M.S. degrees from the University of Rhode Island in agriculture and agronomy respectively and the Ph.D. in botany from the University of California at Davis. For five years, Dr. Hull studied the physiology of perennial weeds at Purdue University in Indiana. At Rhode Island, his research has concentrated on the nutrition of turfgrasses, woody ornamentals, and tidal salt marsh vegetation.

When high fertility stimulates shoot growth, its impact on the energy supply to roots and their growth is certainly important in any long-term consideration of turfgrass quality. Schmidt (1980), in his earlier **ALA** article, made this point in regard to greater bluegrass vulnerability to drought injury when roots were deprived of carbohydrates. To gain some insight into the annual energy distribution pattern of variously fertilized grass, 6-inch diameter circles of turf were exposed to radiocarbon labelled CO_2 (Hull, 1976). The radiocarbon was introduced into a clear glass bell jar mounted over the grass on an aluminum ring set into the turf (Fig. 2). A premeasured amount of $Na_2\ ^{14}CO_3$ was reacted with lactic acid in a glass vial and the $^{14}CO_2$ formed was circulated through the bell jar by means of a rubber aspirator pump. The $^{14}CO_2$ was fixed photosynthetically and the ^{14}C-sugars produced translocated within the grass plants just as nonlabeled sugars would.

Table 2 presents the results of six

Figure 2

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TABLE 1. Net CO_2 fixation rates by Kentucky bluegrass turf managed at three fertility levels.

Fertilizer Rate	Date Measured			
	8 June	18 July	8 August	14 December
lbs/1000 sq.ft.	mg $CO_2/m^2/min$			
2.5-1-1	36.3 b*	20.4 a	23.5 a	22.9 a
5-2-2	37.8 b	22.3 a	25.9 b	26.5 b
10-4-4	33.6 a	26.8 b	27.6 b	23.4 a

** Values in a column followed by the same letter are not significantly different at the 5% confidence level.*

experiments in which the percent of recovered radiocarbon present in the roots of turf managed under three fertility levels are compared. During the warmest portion of the growing season and in early autumn, low fertility turf translocated more current photosynthetic product to roots than did heavily fertilized grass. Even though the net photosynthetic rate of high fertility turf was greater than that of less fertilized grass (Table 1), most of the extra energy was probably consumed in greater shoot growth because there was no increased transport to roots. In December, fertility level had no effect on the amount of current photosynthate recovered in

Fall fertilizing has no adverse affects on seasonal energy balance of turf

TABLE 2. Percent of the ^{14}C fixed by Kentucky bluegrass turf that was recovered from roots after exposing the turf to $^{14}CO_2$.

Fertilizer Rate	Date exposed to $^{14}CO_2$				
	22 June	7 July	1 Sept.	27 Oct.	13 Dec.
lbs/1000 sq.ft.	% of recovered ^{14}C*				
2.5-1-1	13.4 a**	12.4 b	10.4 b	9.7 b	13.9 a
5-2-2	11.7 a	10.1 ab	9.9 b	10.8 b	12.6 a
10-4-4	14.4 a	8.3 a	7.6 a	7.5 a	14.2 a

**Roots sampled twice, 24 - 96 hrs. after exposure to $^{14}CO_2$.*
***Values in a column followed by the same letter are not significantly different at the 5% confidence level.*

roots and transport to roots was greater than at any time studied. It appears that the substantial net photosynthesis occurring during the cold season is utilized mostly to support root and possibly rhizome growth. The turf receiving 10 pounds nitrogen per year may have sustained some cold injury as indicated by its lower net photosynthetic rate, however, the transport of photosynthate to roots of this grass was not impaired. In late spring, net photosynthetic rates were high and transport to roots was also high. Again, a slightly depressed photosynthetic rate in heavily fertilized turf was not reflected in less translocation to roots.

Bluegrass

To the turfgrass manager, these results should be reassuring. Fertilizing grass in the fall to maintain good color longer in the autumn and to stimulate early spring green-up apparently has no adverse effects on the seasonal energy balance of turf. The probable importance of cold season photosynthesis and transport of sugars to roots may suggest some management practices. Tree leaves or any light obstructing materials should be removed from the turf in winter even though no visible growth is occurring. At the last mowing in the autumn, turf should be cut at a height of about one inch so that a leaf surface will be available to carry on photosynthesis. A higher cut will trap tree leaves within the turf and when longer grass leaves are killed during the winter they will mat and exclude light from younger leaves. Fertilizer applied in late autumn will contact a grass root system which is well supplied with energy and capable of absorbing nutrients to support current root growth and shoot growth in the spring. Nutrients available in the fall will also help maintain green photosynthetically active leaves throughout the winter and enable the grass better to resume vigorous growth in the spring.

While most lawn care will continue to be practiced during the growing season, an understanding of what turfgrasses are doing throughout the year may provide a better understanding of how good management practices produce superior lawns and satisfied clients.

^ ^ ^

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P.L.C.A.A. Regional Seminars

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Hilton Inn
I-5 and Warrensville Rd.
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8:30 am - 5:00 pm

Contact: Bill Fischer, President
Spring Green Lawn Care
P.O. Box 908
Naperville, IL 60540
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TOPICS:

1. *How to Establish a Price for Your Service*– Tom Hofer, Spring Green Lawn Care Corporation
2. *Workshop for Figuring Cost Analysis*– Tom Hofer, Spring Green Lawn Care Corporation
3. *Current Insect Problems*– Dr. Roscoe Randell, Univ. of Illinois Extension
4. *Fusarium– What Others Are Doing About It*– Panel
5. *Positive Public Relations for Our Industry*– Wm. R Fischer, Spring Green Lawn Care Corporation
6. *Opportunity to Help Hire a Disease Specialist* and *Update on PLCAA*– Richard White, Village Green Ltd.

Seminars con't

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9:00 am
Contact: Gordon Ober, Gen. Mgr.
Davey Landscape
117 South Water St.
Kent, OH 44240
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TOPIC(S):

The Timing of Insecticide Applications for Control of Billbugs, Chinchbugs, and Grubs in the Northern Ohio/Western Pennsylvania Region– Dr. Harry Niemczyk, Research Entomologist with the Ohio Agricultural Research and Development Center at Wooster, Ohio Hazardous Waste Update

NEW YORK– July 25

New York State Pathological Facilities
Department of Environmental Conservation
Albany, NY
Contact: (After July 13)
Don Burton, President
Lawn Medic, Inc.
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(716) 494-1462
*Details to be announced.

P. L. C. A. A.

The Professional Lawn Care Association of America's 2nd Annual Conference and Trade Show will be held at the Commonwealth Convention Center, Louisville, KY, November 18-20. Contact Jane Stecker, PLCAA, Suite 1717, 435 N. Michigan Ave., Chicago, IL 60611, (312) 644-0828.

Recognizing New Diseases of Turfgrasses

by Marc C. Hirrel and Malcolm C. Shurtleff

Malcolm C. Shurtleff *is Professor and Extension Specialist in Plant Pathology at the University of Illinois. He received his B.S. degree from the University of Rhode Island and both the M.S. and Ph.D. degrees in Plant Pathology from the University of Minnesota. Dr. Shurtleff's turfgrass interests lie chiefly in evaluating potential new fungicides and the effects of various cultural management practices on disease development.*

Marc C. Hirrel *is a Research Extension Associate in Plant Pathology. He received his B.S. degree from California State University at Long Beach. The M.S. and Ph.D. degrees in Plant Pathology were earned from the University of Illinois. Dr. Hirrel's research interests include evaluating new techniques for measuring development of Helminthosporium leaf spot.*

The intense maintenance and management practices of ornamental turfgrasses may result in the "spontaneous creation" of a new disease. When specific cultural or chemical practices are not implemented at the critical time or managed in the proper way, a "new" disease can get out of hand. Changes in maintenance or the introduction of a new turfgrass cultivar may change a weak, latent parasite into an aggressive, virulent pathogen. Our companion article (Jan/Feb 1981) discusses the effect of cultural practices on turf diseases. However, it cannot be emphasized enough how important disease management is for turfgrass and how every aspect of turfgrass cultivation affects pest populations.

The pathogen, host, soil and air environment all interact in the development of disease. While changes in any one of these components can cause variation in the expression of disease, it is generally considered that a change (mutation) occurring in the pathogen population initiates the start of a new infectious disease. Mutants, which may always be present in low numbers, await a favorable change in the environment to multiply and incite the development of a new disease. Nature tends to select against these mutants or strains; man, at the same time, selects for them. Man does this through cultural practices that favor growth of pathogens or by the misapplication of pesticides. No fungicide completely eradicates a fungal pathogen from a turf area. Populations are reduced and selection pressure is placed on the remaining individuals which are tolerant or resistant to the fungicide applied. Such pressure may be responsible for the development of of cool weather strains of fungi causing Pythium blight and Rhizoctonia brown patch.

Cool weather Pythium blight causes a rapid dying of turf, often resembling red leaf spot on bentgrass. It is always preceded by a water-soaked appearance of the leaf blades. This watersoaking symptom is often visible in early morning before disappearing as daytime temperatures increase, and is a key diagnostic character. This disease is prevalent in early spring, but can also be seen in the fall causing a seedling blight of newly seeded areas. Under cool, wet conditions this disease can spread over large areas killing young bluegrass, bentgrass, ryegrass, or other seedlings within 24 hours.

Pythium blight is prevalent in early spring

Cool weather Rhizoctonia brown patch occurs primarily in the fall or during a mild winter. Fall symptoms are very similar to those occurring in the summer and are more intense following a drought period. Kentucky bluegrass is most susceptible when moisture stress and a thick thatch layer are also present.

The brown patches produced by the new strain or species of Rhizoctonia can vary from several inches to several feet. The typical smoke ring symptom of summer brown patch is not always present. Instead a chlorotic ring or an entire yellowing of the infected area may occur, hence the alternate name Yellow Patch. Research in Bermuda showed that as temperatures increase, the yellow, diseased patches appear to recover. However, if prolonged wet periods accompany rising temperatures, then the chlorotic yellow areas may turn brown. In early spring, these brown dead areas of grass can be mistaken for Fusarium patch, if symptoms were not noted the previous fall.

Because of the increasing incidence of these new strains, University of Illinois turfgrass specialists recommend fungicide applications be lengthened into early spring and late fall. Using combinations of fungicides or alternating between chemicals recommended for control of Pythium blight and Rhizoctonia brown patch will reduce the chance of selecting tolerant strains. Before applying any chemical to control Pythium blight, Rhizoctonia brown patch or any other turf disease, an accurate diagnosis of the diseased area must be made by an experienced turf pathologist. Verification of the Pythium or Rhizoctonia fungus must be made by culture isolation and microscopic examination of infected roots, crowns, leaf sheaths, or other tissues. It is critical that a thorough examination be done since the chemicals that control these two diseases are rather specific and not readily interchanged.

Nematodes are not "new" pathogens to turf. Unlike Pythium or Rhizoctonia, they only occasionally cause

Fall brown patch in a Kentucky bluegrass lawn. (Courtesy Dr. R. E. Partyka)

Close up of fall brown patch in a Kentucky bluegrass lawn. (Courtesy Dr. R. E. Partyka)

New Diseases

serious problems, except in the southern states. Actually these pathogens cause chronic, long-term problems all over the U.S. They will feed and multiply for years on the roots and show rather nondescript above ground symptoms of slow-to-green areas of vigorless turf that periodically succumbs to stress conditions. We are only beginning to understand the population dynamics of nematodes and how critical levels of certain species in the soil can be equated to damage thresholds.

As with other diseases, the variety of grass and management practices affect nematode diseases. Soil type and porosity also play a major role in disease development. With the advent of USGA sand-based greens, disease loss from Pythium and Rhizoctonia was reduced because of improved soil drainage. However, this porous medium, with its low organic matter content, is ideal for the rapid reproduction of most plant-parasitic nematodes. Nematode problems are complex. They often involve several different species each feeding on roots in a different manner. Some feed internally, some externally remaining fixed to their feeding site, while others "graze", feeding at different sites along the root. This diversity of feeding habits further compounds the problem because each feeding site allows for the entrance of soilborne fungi and bacteria that may act as secondary parasites on the weakened root.

When turf areas are thin, slow-to-green and fail to regain vigor after adequate fertilization and watering or fungicide treatment, or die out rapidly after a stress period, you should suspect a nematode problem. Applying a test strip of a granular nematicide, such as fenamiphos (Nemacur) or ethoprop (Mocap), will determine if such areas will respond to nematicide treatment. Once every year or two, soil sampling of problem turfgrass areas and all sand-based greens should be done to determine if nematode populations are below damage thresholds. Such soil samples should be submitted to an experienced turf pathologist or nematologist for identification and damage threshold evaluation.

Spring dead spot of bermudagrass in a home lawn (APS photo)

Nematode problems are complex

Spring dead spot is a chronic disease problem on highly maintained bermudagrass. In early spring, bermudagrass just breaking dormancy begins to die, often resembling winter injury. These dead areas occur in the same location year after year and may enlarge up to 2 to 3 feet in diameter. Once warm temperatures return, there is often a remission of symptoms. The disease is associated with a Helminthosporium fungus, but the entire disease syndrome may be a complex of factors, including microbial toxins, the

Winter brown patch on a creeping bentgrass golf green. (Courtesy Dr. R. W. Smiley)

Red leaf spot attacking a Toronto creeping bentgrass golf green.

exact nature of which is not fully understood. No effective controls have been developed. The best suggestion is to reduce irrigation and fertilization plus removal of excessive thatch.

St. Augustine decline (SAD) is the only serious viral disease of turf in this country, and is confined to St. Augustinegrass. The grass takes on a pale to dark green mottled appearance which eventually appears as short yellow streaks on the leaf blades. Infected turfgrass turns bright yellow, grows slowly, thins out, and dies within 3 to 4 years from continued weakening, winter kill, or is crowded out by invading weeds. The disease is spread to healthy plants by mowing through infected areas. Development of resistant varieties is the best means of control for this disease; fungicides, fertilization, and watering are not effective measures.

Other countries report turf being infected by different viruses. Some strains attack both turfgrasses, wildgrasses, and small grains. It is important that such diseases not be introduced into our country where wide scale epidemics may develop.

Several types of pleomorphic bacteria, mycoplasmas and spiroplasmas, have been isolated from diseased turfgrass. These bacteria are not easy to detect. However, new techniques now allow us to culture and identify these organisms which live in the phloem tissues of plants. Research in India on bermudagrass has uncovered a mycoplasma-like organism associated with a "white leaf disease" and a spiroplasma associated with a "witches'-broom syndrome". Both these diseases first appear as a yellowing of the leaf blades. In white leaf disease, the leaf blades continue to discolor and show poor growth. With witches'-broom syndrome, the stolons produce numerous side branches that bear small stunted leaves. Remission of symptoms can occur following treatment with tetracycline antibiotics, but use of these chemicals would be impractical on a large scale basis.

Recognizing and identifying turfgrass diseases is no easy task. Most diseases involve a dying out and browning of the grass with very little to distinguish any one disease from some two dozen or so similar diseases. The first line of defense against any disease is proper identification of the causal agent. This requires the skills of an experienced turfgrass pathologist, who takes the time to culture and examine the true cause. Samples of diseased

New Diseases

plants must be taken for accurate diagnosis. Such samples should be made as follows:

1. Cut about a 4 x 4 inch section about 1 to 2 inches deep from the margin of the spotted or dead area. This section should include both healthy and diseased grass plants.
2. Mold aluminum foil or wrap newspaper around the soil. DO NOT wet the sample or place it in plastic. Leave the grass surface uncovered.
3. Place the sample securely in a sturdy cardboard box. Such samples will keep for 3 to 4 days in the refrigerator, if mailing is delayed.
4. Contact your local county agent or turfgrass specialist for specific instructions. Give him accurate information on the symptoms, weather conditions prior to disease development, pesticides and fertilizers used in the past several weeks or more, grass variety, age of stand, and a description, sketch, photograph, or ask for an in-person inspection of the diseased area. The turf specialist and turf pathologist are the individuals best trained to identify new disease problems. Your cooperation with them is vital in assessing potential new diseases and developing preventative measures to control them.

^ ^ ^

New U.S. Chemical Venture for Maker of Nitroform Slow Release Fertilizer

FBC Chemicals, Inc. is the name of the new company formed to market and distribute products in the United States formerly marketed by Fisons, Inc., Bedford, Mass. and the Boots Hercules Agrochemicals Co. in Wilmington. The U.S. chemical company will have its corporate headquarters in Wilmington. FBC Chemicals, Inc. is the result of an announcement made late in 1980 by their parent companies Fisons, Ltd. and the Boots Company, Ltd. that they would merge their specialty chemical and agrochemical interests on a worldwide basis.

For more information, contact George E. Jones, FBC Manager of Communications, or use reply card.

Circle No. 3 on Reader Reply Card

P.L.C.A.A.– Please Note

Perhaps it is possible to control as many weeds with organized effort, as it is with herbicides. Particularly if you agree that a weed is a plant that is out of place.

Here in Michigan tons of Kentucky 31 are sold every year. Kentucky 31, also known as tall fescue, is considered by all turf experts in this state to be a very serious lawn weed! I have a letter on my desk signed by Dr. Paul Rieke, Dr. Joe Vargas, Dr. K. T Payne and Dr. John Kaufmann which states that they consider tall fescue (Kentucky 31) to be among the three worst lawn weeds in Michigan.

In Pennsylvania they are in the process of changing their seed labeling laws. One such proposed regulation is that tall fescue will be labelled as a noxious pasture grass if it is present in a quantity of LESS than 5%. In instances where it exceeds 5% it will not be a noxious turfgrass. This is like saying a little bit is BAD for you, but a lot of it is OK.

Nearly every week I see a full page ad on the many splendid advantages of Zoysia grass. Homeowners in Michigan and most other states do not realize that even after their Zoysia plugs fill in (after 5 - 10 years) they will not have a lawn similar to the one pictured in the advertisement except for a 6-week period in mid-summer. Zoysia and Kentucky 31 in Michigan are weeds and the great tragedy is not only that the merchandisers are profiting by the sale of weeds to unsuspecting citizens, but that we do not communicate with Federal and State Agricultural officials to advise them that more control is urgently needed.

Perhaps one of the finest things that the new Secretary of Agriculture could do is require that all top level officials attend the local land grant university and learn about things like turfgrass, ornamental care, etc. etc. Consider that we are all into agriculture– that it also extends from the perimeter of the farm to the center of the city– that the largest number of seed buyers population-wise are the middle-class home lawn owners– and that "sod" is an official agricultural product.

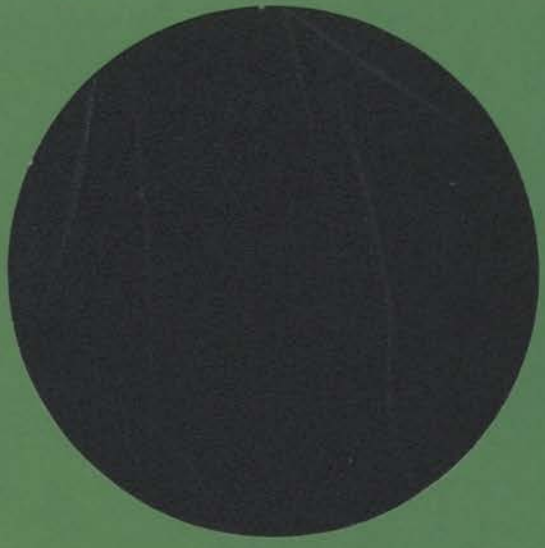
I believe that on both a national scale and state level there are a great many problems with the regulation of lawn seed. As we approach the beginning of the 21st Century maybe we can get USDA officials to recognize that crabgrass is a noxious lawn weed. Does this sound silly to you? As of this moment 47 out of 49 continental states have yet to list crabgrass as "noxious" in their lawn seed regulations. (New Hampshire and Nevada as well as Canada have discovered that crabgrass is noxious). By the way, according to USDA officials rye grass is a "coarse" textured grass while bluegrass, having a wider blade, is a "fine ' textured grass!!!

But I think that the P.L.C.A.A., having a great national organization as a base of operation, can persuade the government to at least recognize crabgrass. After all we've even recognized Red China. I say recognition begins at home!

Another suggestion. We have arrived at the point in which we should *advise* researchers of the areas that need

Continued on next page

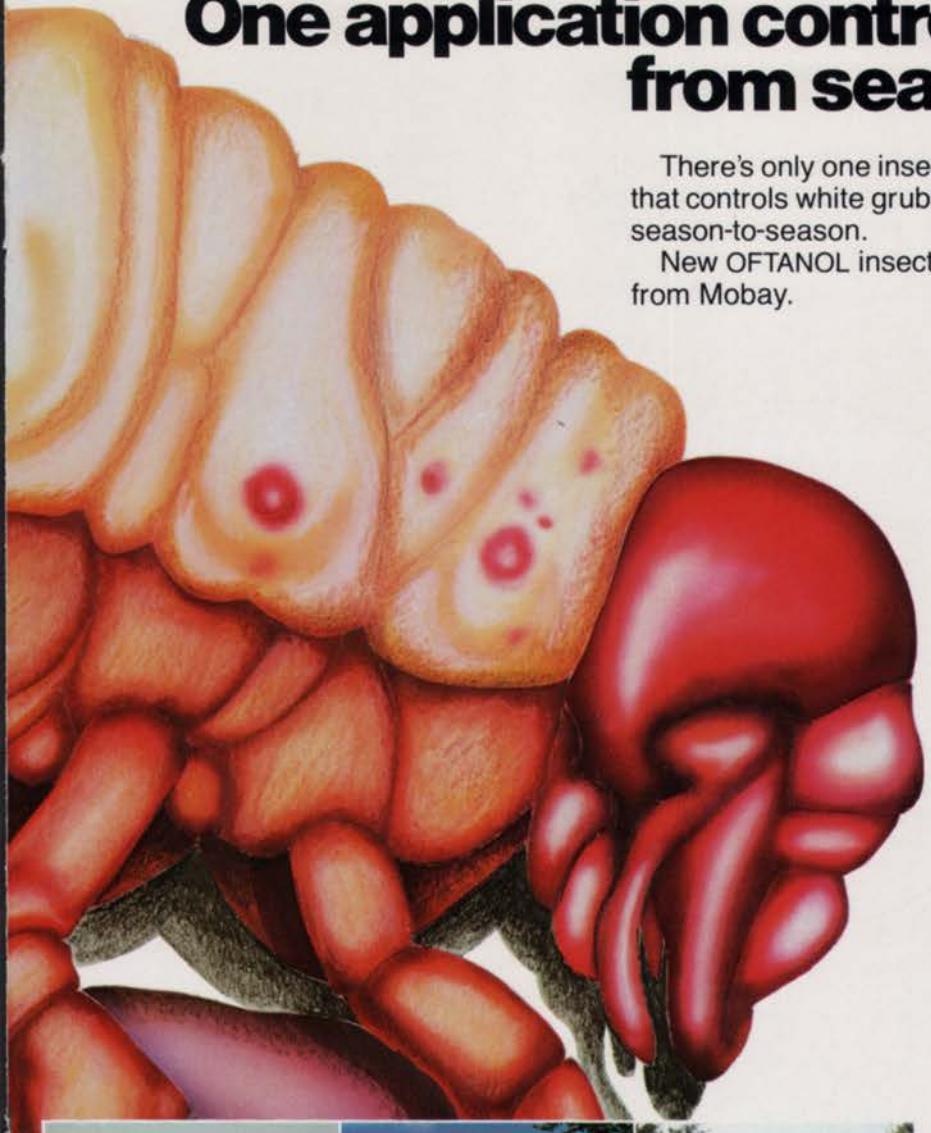
Now, one-shot white grub control.



New

OFTANOL®

One application controls white grubs from season-to-season.



There's only one insecticide that controls white grubs from season-to-season.

New OFTANOL insecticide from Mobay.

OFTANOL delivers unparalleled residual control of white grubs. In fact, you can expect one application of OFTANOL at the highest recommended rate to control white grubs until about the same time next year.

OFTANOL also offers these additional advantages compared to present white grub materials:

- OFTANOL does not require watering-in.
- OFTANOL does not tie-up in thatch.
- OFTANOL does not require critical application timing.

One application. Once a year. That's the OFTANOL one-shot advantage.

MOBAY

Mobay Chemical Corporation
Agricultural Chemicals Division
Specialty Chemicals Group
Box 4913, Kansas City, MO 64120

New, one-shot white grub control.

OFTANOL also controls these major turf insects.

OFTANOL has been proven effective for control of sod webworm, Hyperodes weevil, billbugs and chinch bugs. Consult the product label for the proper timing for control of these pests.

New OFTANOL. For one-shot white grub control *and* in-season control of other pests. Available from many leading turf chemical suppliers.

The use of OFTANOL for turf pest control is registered in many states. Check with your state extension office for details.

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BILLBUG

CHINCH BUG

HYPERODES WEEVIL

Mobay Chemical Corporation
Agricultural Chemicals Division
Specialty Chemicals Group
Box 4913, Kansas City, MO 64120

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What are your major turf diseases?

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Who is your turf chemical distributor?

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P.L.C.A.A. con't

to be studied. (Should we not lead instead of follow?) There are many areas in lawn spraying that ought to be looked into. Our collective industry might save millions of dollars if it were determined through research that a pound of N per 1,000 square feet would result in the same benefits when applied with *one* gallon of water rather than *five*. If this is the case, immense savings in fuel, truck costs, maintenance, water, time (fill-ups), license costs, insurance, overhead (storage) could be saved. This is only one of many areas of possible research. I truly believe that there are many university researchers looking for suggestions which can lead to practical application. We need to counsel with one another to determine the priorities and *communicate* with the universities. We have at our disposal hundreds of scientists who are willing to devote a substantial part of their lives to improve our efforts. Can't we give them a nudge in the right direction?

Let us consider extending ourselves beyond seminars. Other areas are too important to be overlooked.

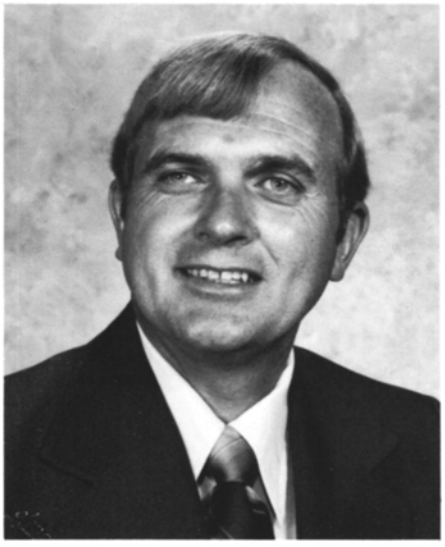
With hope for the future,
Art Brown, Editor

P.S. Thanks P.L.C.A.A. for accepting my application for membership.

Part 2

Postemergence Control of Summer Weeds[1]

by B. J. Johnson



B.J. Johnson is a professor in Agronomy and research project leader on management of herbicides for weed control in turfgrass at the Georgia Experiment Station, University of Georgia, at Experiment. He received his B.S. from Berry College, Rome, Georgia and M.S. in Agronomy from Texas A&M University. For the last 10 years he has conducted studies on management of herbicides for weed control in warm and cool-season turfgrasses. His major interest has been to evaluate herbicides using different management practices to determine the least amount of chemicals needed for effective control of summer and winter weeds. These results have been widely accepted. Mr. Johnson is a member of the Editorial Committee of Weed Science Society of America and member of Weed Science Society of America, American Society of Agronomy, Crop Science of America, The International Turfgrass Society and Gamma Sigma Delta.

Two applications of MSMA at 3.0 lb/A did not satisfactorily control goosegrass when applied alone or in sequence with Betasan or Balan (Table 4). However, the control was acceptable when MSMA was applied in sequence with Ronstar. Postemergence treatments of Sencor were effective in controlling goosegrass and control was not improved when applied in sequence with any of the preemergence herbicides. Since MSMA applied at 3.0lb/A in each of two applications controlled goosegrass for 4 to 5 weeks in a separate study (Table 3), the results from the present study indicate that goosegrass plants emerged after MSMA treatments. A greater percentage control of goosegrass was from sequential treatments of Ronstar with MSMA than from MSMA alone, or Betasan and Balan with MSMA.

These results suggest that sequential treatments of postemergence herbicides and preemergence herbicides may be helpful in controlling summer weeds. In our studies, crabgrass did not germinate after the MSMA treatments were made, therefore, preemergence herbicides were not needed. However, it is common for crabgrass to germinate after MSMA treatments and preemer-

TABLE 3. Goosegrass control and common bermudagrass injury as affected by herbicide treatments.

Treatments[a]			Goosegrass control[b]	Turf Injury[c]
Herbicide	Rate	Application		
	lb ai/A	No.	%	%
MSMA	2.0	1	13	0
		2	58	0
	3.0	1	38	0
		2	86	0
Sencor	0.25	1	17	9
		2	63	30
	0.5	1	56	12
		2	98	31
MSMA + Sencor	2.0 + 1/8	1	38	15
		2	97	19

a. Herbicides were applied to mature goosegrass in late July or early August and ratings were made 3 or 5 weeks after initial treatment.

b. Goosegrass control ratings are averages from 3 experiments over a 2-year period where 0 = no control and 100 = complete control.

c. Turf injury ratings were based on percentage of MSMA treatments where 0 equals MSMA treatments, 1 to 15 represents slight injury, 16 to 30 as moderate injury and above 30 as severe injury.

TABLE 4. Effect of herbicide combination treatments on control of crabgrass and goosegrass.[a]

Herbicides for Postemergence control			Herbicides for preemergence control (lb ai/A			
Treatments	Rate	Application	Untreated check	Betasan 10.0	Ronstar 4.0	Balan 3.0
	lb ai/A	No.		% Control[b]		
				Crabgrass		
Untreated	—	—	0	0	0	0
MSMA	2.0	1	95	99	95	94
		2	99	99	100	99
Sencor	0.5	2	94	100	99	97
	1.0	1	84	94	93	86
				Goosegrass		
Untreated	—	—	0	0	0	0
MSMA	3.0	2	61	39	89	73
Sencor	0.5	2	98	96	100	96
	1.0	1	96	95	100	98

a. Herbicides were applied in late spring as separate treatments.
b. Ratings were made in August and are averages from 2 years and based on 0 = no control and 100 = complete control.

gence treatments may be needed under different soil and environmental conditions. Sencor controlled goosegrass effectively throughout the summer when applied alone, but MSMA did not. Sequential treatments of MSMA and Ronstar controlled goosegrass effectively since Ronstar prevented germination of the weed seed.

DALLISGRASS CONTROL

Dallisgrass control from MSMA treatments varied from poor in our studies in 1976 to excellent in 1977 (Table 5). There was no difference between rates and frequency of MSMA treatments within each year. Two applications at 2.0 lb/A controlled 72% dallisgrass during the first year compared to 99% the following year. Excellent dallisgrass control from MSMA treatments is shown in Figure 2. There was no advantage in control from three applications at 2.0 lb/A rate or from 2 or 3 applications at 3.0 lb/A rate. It is not known why the difference in dallisgrass control occurred between years. Therefore, it will be necessary to repeat treatment for two consecutive years for complete dallisgrass control.

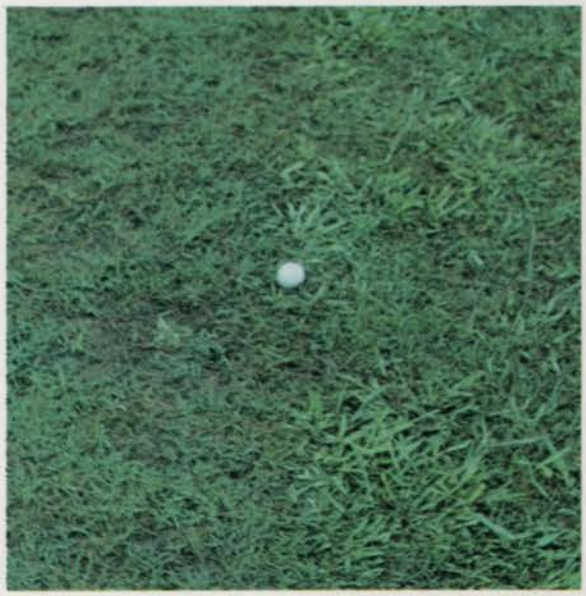


Figure 2: Dallisgrass control with MSMA. Plot on left treated with two applications in August compared with untreated plot on right. Picture was made 8 days after second treatment.

SPOTTED-SPURGE CONTROL

Spotted-spurge is found in turfgrasses and competes strongly with the grass throughout the summer. In our studies, we found that Sencor controlled spotted-spurge very well with a single application (Table 6). The control from 0.125 lb/A was variable and repeated treatments would probably improve overall weed control. Preliminary data from Georgia has shown that 2, 4-D type herbicides did not control spotted-spurge effectively with a single application. It appears that when spotted-spurge is present in high population, it will be necessary to apply multiple herbicide applications for effective control.

Summer Weeds

PURPLE NUTSEDGE CONTROL

Purple nutsedge is a major perennial weed problem throughout the Southweast. In 1969, it was included as one of the 10 worst weeds in the world. At present we do not know of any herbicide that will effectively control purple nutsedge. Top kill of the plant can be obtained from MSMA and Basagram treatments. We found that MSMA at 2.0 lb/A caused a greater top kill when the chemical was applied in July than in May or June.

Basagram (1.0 or 2.0 lb/A) controlled purple nutsedge temporarily when applied in June, but not in late summer. The chemical controls yellow nutsedge much better than purple nutsedge.

TOLERANCE OF TURFGRASSES AS AFFECTED BY HERBICIDES

MSMA can be safely applied to several bermudagrass cultivars for weed control without severely injuring the turf. MSMA discolored Tifway, Ormond, and Common bermudagrass slightly more than Tifgreen or Tifdwarf when ratings were made two weeks after post treatments (Table 7). By four weeks the turf had completely recovered from MSMA treatments.

Combinations of MSMA + Sencor caused severe discoloration of all bermudagrass cultivars except Tifdwarf at two weeks after post treatment (Table 7). Tifdwarf was discolored only slightly (8%) from the treatment, while Tifway was injured the most (43%). Tifway was also injured more than Tifgreen from MSMA + Sencor treatments as shown in Figure 3. All bermudagrass cultivars had essentially recovered from MSMA + Sencor treatments by 4 weeks and turf stands were not affected when ratings were made at 6 weeks.

TABLE 5. Postemergence dallisgrass control in bermudagrass with MSMA

Treatments [a/]		Dallisgrass control [b/]	
Rate	Number of Applications	1976	1977
lb ai/A		----------%----------	
2.0	2	72	99
	3	74	100
3.0	2	76	99
	3	78	100

a/ Treatments were applied to mature dallisgrass and repeat treatments were made at 7-day intervals.

b/ Dallisgrass control ratings were made 2 months after first treatment and based on 0 = no control and 100 = complete control.

TABLE 6. Postemergence spotted spurge control in bermudagrass with Sencor

Rates [a/]	Spotted spurge	
	1 week	3 week
lb ai/A	----------% control [b/] ----------	
0	0	0
0.125	43	76
0.25	71	84
0.5	88	100

a/ Treatments were made in August.

b/ Control ratings were made at 1 and 3 weeks after treatment and based on 0 = no control and 100 = complete control and are averages from 2 years.

These results indicate that MSMA will discolor bermudagrass only slightly for a few days after treatment. However, the discoloration was more severe from MSMA + Sencor treatments. The discoloration was temporary as the bermudagrass fully recovered within a few weeks after treatment. Neither MSMA, Sencor, nor MSMA + Sencor should be applied to zoysia because of severe injury. MSMA will also injure centipedegrass.

SUMMARY

Major findings from studies conducted on postemergence herbicide treatments for controlling summer weeds in bermudagrass are:

a) MSMA applied at 2.0 lb/A controlled crabgrass effectively. However, in most instances a second treatment was needed at 12-day intervals for optimum control.
b) Two applications of MSMA + Sencor at 2.0 + 0.125 lb/A controlled goosegrass in bermudagrass turf. Postemergence MSMA treatments and preemergence oxadiazon treatments applied in late spring controlled goosegrass much better during the summer than MSMA alone.
c) Dallisgrass was controlled in bermudagrass with two applications of MSMA at 2.0 lb/A. Treatments may need to be applied for two consecutive years for complete control.
d) Sencor controlled spotted-spurge but repeated treatments will probably be needed at 0.125 lb/A rate.

^ ^ ^

TABLE 7. Tolerance of five bermudagrasses as affected by herbicide treatments.

Treatments[a/]		Turfgrass injury[b/]				
Herbicide	Rate	Tifway	Tifgreen	Tifdwarf	Ormond	Common
	lb/A			%		
				Two week		
MSMA	2.0	9	2	0	12	16
MSMA + Sencor	2.0 + 1/8	43	28	8	38	32
				Four weeks		
MSMA	2.0	0	0	0	0	0
MSMA + Sencor	2.0 + 1/8	0	4	0	0	6

[a/] *Herbicides were applied in two applications in early August.*

[b/] *Turf injury ratings were made at 2 and 4 weeks after the first treatment and are averages for 2 years. Ratings were based on 0 to 100 where 0 = no injury, 1 to 15 = slight injury, 16 to 30 = moderate injury, and above 30 = severe injury.*

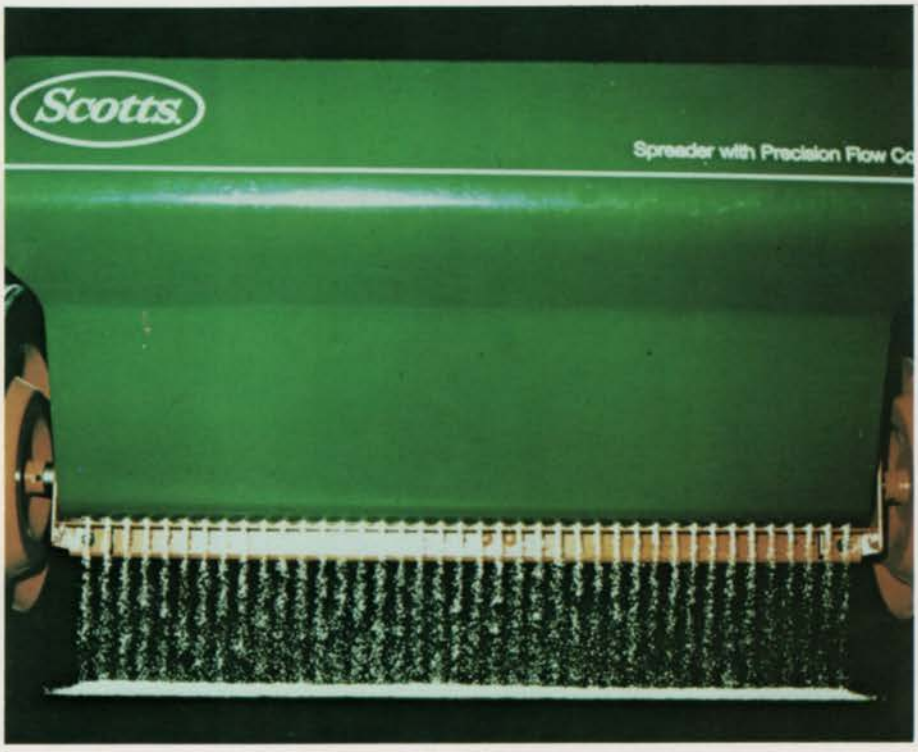
Figure 3: MSMA + Sencor treatments on bermudagrass cultivars. Tifway treated in the top picture in the left plot was severely injured while Tifgreen in the bottom picture was not injured at the same rate. Pictures were made two weeks after second treatment.

Part 1

Selection, Care, and Use of Granular Applicators

by Richard L. Parish, PE

Richard L. Parish is Manager of Mechanical Research & Development for O.M. Scott & Sons Co., Marysville, Ohio. He holds BS, MS, and PhD degrees in Agricultural Engineering from the University of Missouri and is a registered Professional Engineer. Prior to joining Scotts, Dr. Parish was Associate Professor of Agricultural Engineering at the University of Arkansas, and a consultant in farm machinery design and testing. He is an officer on the Agricultural Chemical Application Committee of the American Society of Agricultural Engineers.



Uniform distribution from a drop spreader.

Many lawn care service applicators use granular products as a part of their program or even as a complete program. Proper selection, care, and use of granular applicators can minimize costs and maximize the results obtained. Improper use of granular applicators can reduce product efficacy, cause injury to turf and ornamental plantings, increase costs, and damage the spreaders.

BACKGROUND PRINCIPLES

There are two important aspects to the precision application of granular products. The first area of concern is the product application rate. This term refers to the overall average amount of product applied in pounds per thousand square feet. Every product, whether fertilizer or pesticide, is designed and recommended for application at some specific rate. Over-application is costly, increases the risk of plant injury, and may be illegal if label recommendations are exceeded. Under-application can reduce the efficacy of the product and thus cause customer dissatisfaction. Equally important is uniform distribution. This aspect is different from the application rate. For example, a fertilizer might be labelled for application at four pounds per thousand square feet. If a spreader applies twenty pounds to a five thousand square foot lawn, the apparent rate of application is correct, but it is possible that some areas of the lawn received twice as much fertilizer per square foot as did other areas. It is impossible to achieve absolutely uniform distribution with any granular applicator, but the most uniform distribution possible is particularly important with turf. Under the right conditions, small differences in rate on different areas can result in very obvious stripes, spots, etc., in the turf.

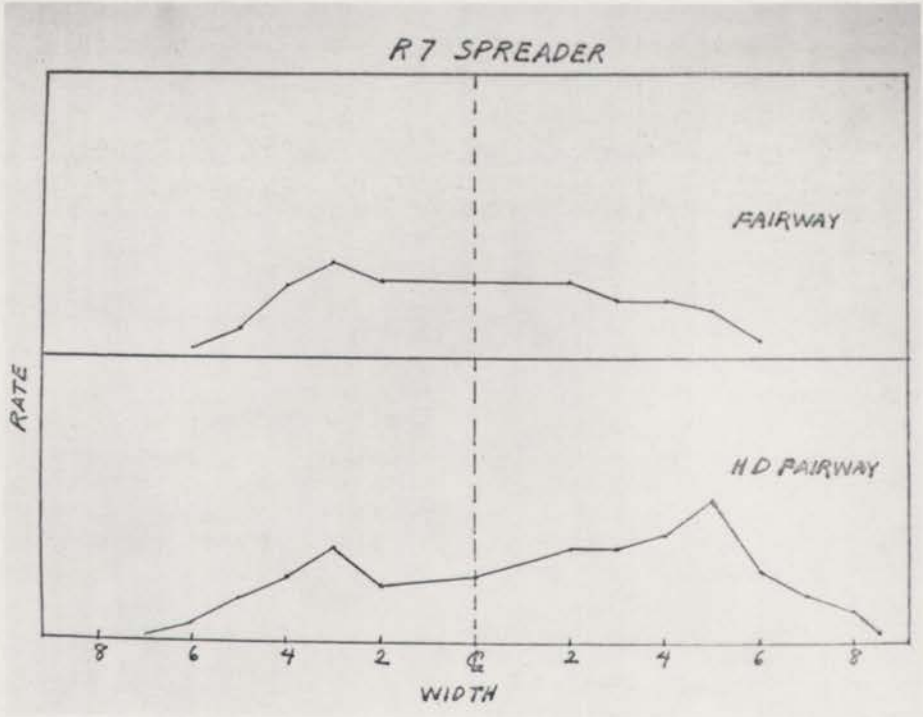
It would be desirable for all spreaders to deliver the same rate of product per thousand square feet regardless of ground speed. This characteristic is referred to as volumetric metering. The opposite extreme is gravimetric metering, in which the flow rate of product out of the spreader remains constant with time, regardless of speed. With gravimetric metering, the application rate per thousand square feet is inversely proportional to the speed. Most drop-

type spreaders are a cross between volumetric and gravimetric metering; i.e., the application rate increases somewhat as the speed decreases. Most rotary spreaders are essentially gravimetric. Uniform ground speed is thus necessary to get a steady delivery rate, and the proper speed is needed if pre-developed settings are to be accurate.

Absolutely uniform distribution is impossible with any granular spreader

With drop spreaders, the pattern is normally the same, whether good or bad, regardless of speed, product physical characteristics, environmental factors, etc., within a fairly broad range. Rotary spreader patterns, on the other hand, are very sensitive to these variables and severe pattern skewing can result if the operator neglects these variables. The pattern applied by a rotary spreader is dependent on impeller characteristics (height, angle, speed, shape, and roughness), ground speed, drop point of the product on the impeller, product physical parameters (density, shape, and roughness of particles), and environmental factors (temperature and humidity). Most of these factors are beyond the control of the spreader operator. Spreader engineers normally try to design rotary spreaders to give an acceptable pattern with a fairly broad range of products and operating conditions. Small rotaries, particularly homeowner models, usually do not have any pattern adjustment, and are designed to perform well with average products, and acceptably with a fairly wide range of products. This is possible because of the very limited swath width. The wider pattern of the larger commercial rotaries is more susceptible to skewing, thus a means of pattern adjustment is usually provided. This adjustment typically consists of blocking off part of the metering port(s) on smaller units, and moving the metering point or changing the impeller geometry on larger units. It is essential that the operator be aware of the need

Effects of uneven distribution. In this case, a rotary spreader was operated at an incorrect swath width.



Effects of product physical characteristics on rotary spreader patterns (prior to correction of pattern). In this case, ther fertilizer used in both tests is the same chemically, but in the lower graph it has been compacted into a high density (HD) product.

Granular Applicators

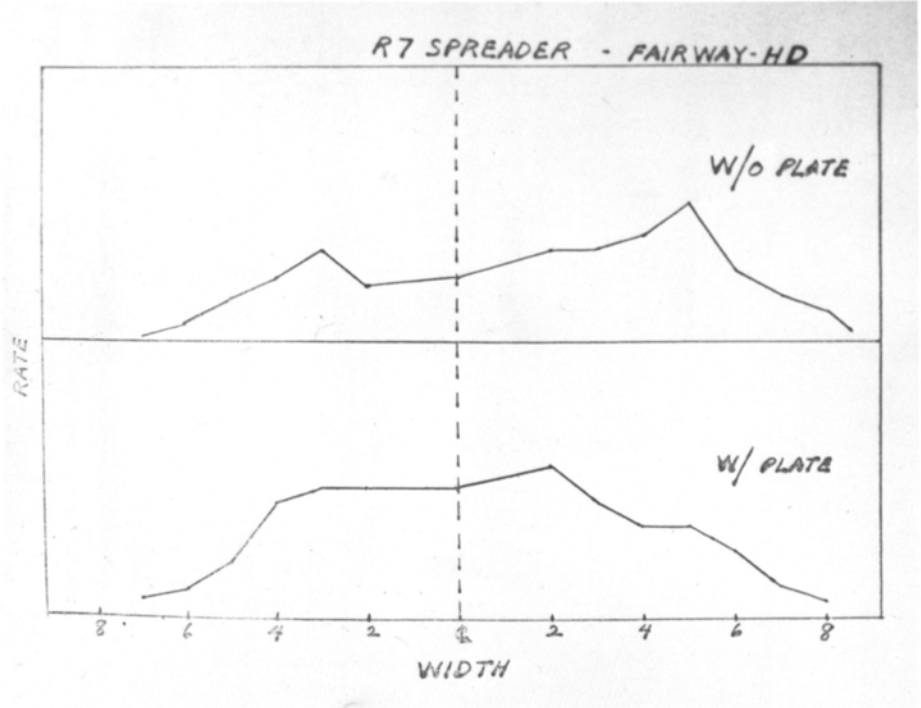
for pattern adjustment and the means of accomplishing this on his particular spreader. The operator should first follow the manufacturer's recommendations on pattern adjustment. If he cannot fully correct skewing this way, there are informal means that can be used such as varying the speed or tilting the impeller. In extreme cases where a product is so heavy or light that skewing cannot be eliminated, it may be necessary to use a wider swath width on one side than on the other.

CALIBRATION

Some drop spreaders provide a means of mechanically verifying and correcting the calibration. If the spreaders being used offer this feature, the operators should take advantage of it. It is suggested that calibration be checked and corrected according to the manufacturer's directions at least once a week when the spreader is in regular use; oftener if the spreader has suffered any abuse or mechanical damage. Obviously, the manufacturer's specs should be followed in calibrating after any disassembly.

Most commercial rotaries do not provide a means for recalibration because the ports are larger and less sensitive to minor variations than are drop spreader ports. Nevertheless, it should not be assumed that a rotary spreader will always deliver exactly the desired rate and pattern. Because of variables in the product, operator variables such as walking speed, and environmental variables as well as spreader variables, it is highly recommended that each spreader, drop or rotary, be checked for proper delivery rate with the specific operator and product to be used. Many product suppliers furnish recommended settings and swath widths. These are as precise as the manufacturer can make them, but the factors just mentioned can add up to a significant rate variation in some cases. Label settings should be used only as the initial setting for verification runs by the operator prior to large-scale use.

Calibration should be checked at least once a week



Effects of pattern correction. In this case, the same HD product was used in both cases, but the lower pattern was corrected by installing a discharge hole cover ("plate").

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Mechanical calibration of a drop spreader using calibration gage provided by the manufacturer.

With rotary spreaders, it is also necessary to check and correct if necessary the distribution pattern. Again, the product label may give a recommended setting and width, but a custom applicator is foolish not to verify the setting and width before treating a large number of lawns. A quick pattern check can be made by operating the spreader over a paved area and observing the pattern. This method is not highly accurate since even major distribution errors may not be visible and because of particle bounce and scatter. A preferred method is to lay out a row of shallow cardboard boxes on a line perpendicular to the direction of travel. Boxes 1-2 inches

The easiest way for an operator to check the delivery rate of a spreader is to spread a weighed amount of product on a measured area, preferrably at least 1,000 square feet for a drop spreader and 5,000 for a rotary, and then weigh the product again to determine the rate actually delivered. A laboratory test stand that allows the spreader to remain stationary while the drive wheel is spun at the correct speed is faster, more precise, and avoids the risk of improper application to a test area, but is usually not available. Another method of rate verification that can be used with drop spreaders is to hang a catch pan under the spreader and push the spreader a measured distance at the proper speed. This method can be precise, but it is essential that the pan be hung on the spreader in such a way that there is no interference with the shut-off bar or rate control linkage.

Checking spreader settings using a motorized test stand.

Granular Applicators

Conducting a rotary spreader pattern test.

high, with an area of about one square foot, spaced on one foot centers are good for commercial push-type rotaries. The row of boxes should cover 1½-2 times the anticipated effective swath width. To conduct the test, pour some product into the spreader, set it at the label setting for rate and pattern, and make three passes over the boxes, operating in the same direction each time. The material caught in each box can be weighed and a distribution pattern plotted, but a simpler procedure is to pour the material from each box into a test tube, vial, or small bottle. When the bottles are stood side by side in order, a plot of the pattern is visible. This pattern can be used to detect and correct skewing and to determine swath width. The effective swath width is twice the distance out to the point where the rate is one half the average rate at the center. For example, if the center 3-4 bottles have material 2 inches deep, and the bottles from the 6 foot positions (6 feet left of the spreader centerline and 6 feet right of the spreader centerline) have material one inch deep, the effective swath width is 12 feet. A more detailed test procedure is spelled out by the American Society of Agricultural Engineers in their standard S341.1, "Test Procedure for Dry Fertilizer Spreaders"[1]. Note that with any of the preceding pattern tests, the product should be swept up after the test.

^ ^ ^

"Selection, Care, and Use of Granular Applicators" will be continued in the next issue.

1. *1980-81 Agricultural Engineers Yearbook*, published by ASAE, St. Joseph, MI pp. 280-281.

Personnel Management in a Small Business

by Walter D. Wasilewski, Management Consultant

Walter D. Wasilewski, President and Senior Consultant with C.O.L.A. Management Consultants, Inc., 53637 Wolf Drive, Utica, MI 48087, (313) 781-3290. Background includes 25 years of experience in administrative and personnel management.

NEW EMPLOYEES ORIENTATIONS

We have selected the best candidates available for the duties that must be completed. Now, with the selection process being completed, it is extremely important that we do not drop the ball. The goals of a good orientation program:

1. Reduce employee turnover
   If an employee feels ineffective, unwanted, or unneeded, he or she may choose to deal with their problems by quitting. This situation results in costly turnover during the break-in period.
2. Reduce start-up costs for a new employee
   Many managers estimate that each new employee costs as much as $2,000 in start-up expenses. A good orientation reduces these costs and allows new employees to reach acceptable standards more quickly.
3. Reduce the amount of ribbing and anxiety that a new employee experiences
   Ribbing takes place when experienced employees "tease" the new employee. For example: "How many lawns have you done today?" When answered, the new person is told that the last one who did so few was here two days. These comments provide a lot of fun for the old timers, but they can cause great anxiety for the recruit. Anxiety may also be caused by fear of failure on a new job. This is a normal fear of the unknown. Good orientation alerts the new employee to ribbing and reduces anxiety.
4. Develop positive employee/employer attitudes, employee job satisfaction and reasonable job expectations
   This process starts with the employee handout that we discussed in the January/February issue.

EMPLOYEE HANDOUT

1. This is our business.
2. What you need to know:
   - Working hours
   - Reporting to work
   - Absence from work
   - Reporting absence
   - Pay period
   - Safety and accident prevention
   - Use of phones
   - How to air complaints
3. Benefits
   - Workmen's compensation insurance
   - Suggestion awards
   - Profit sharing
   - Incentive plans
   - Unemployment compensation
   - Free parking
   - Holidays
   - Bonus plans

This handout is an interesting and clear picture of what the employee can expect and what you expect as a manager.

On a limited time and cash budget and with few employees, the small business cannot afford to set up extensive training programs. The manager who can find methods of improving employees' job knowledge has an advantage.

Illustrations and other ways of explaining how a job can be done should be made available near the work stations or the reporting points. Suppliers and distributors also provide training aids which deal with their product or service. The more employees know about their jobs and how other things relate, the more enthusiastic they usually become.

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Personnel Management

Many times professional organizations can provide services for a fee. Often this fee is not expensive because such organizations have a package program that can be finetuned to your needs. C.O.L.A. Management Consultants, Inc. is one of the many consulting firms which specializes in Personnel Management Programs.

Many associations also provide employee training programs. Many of these programs which we have examined are well organized, therefore excellent results can be expected.

Next issue! We will explore some of the probems that small businesses must resolve.

^ ^ ^

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