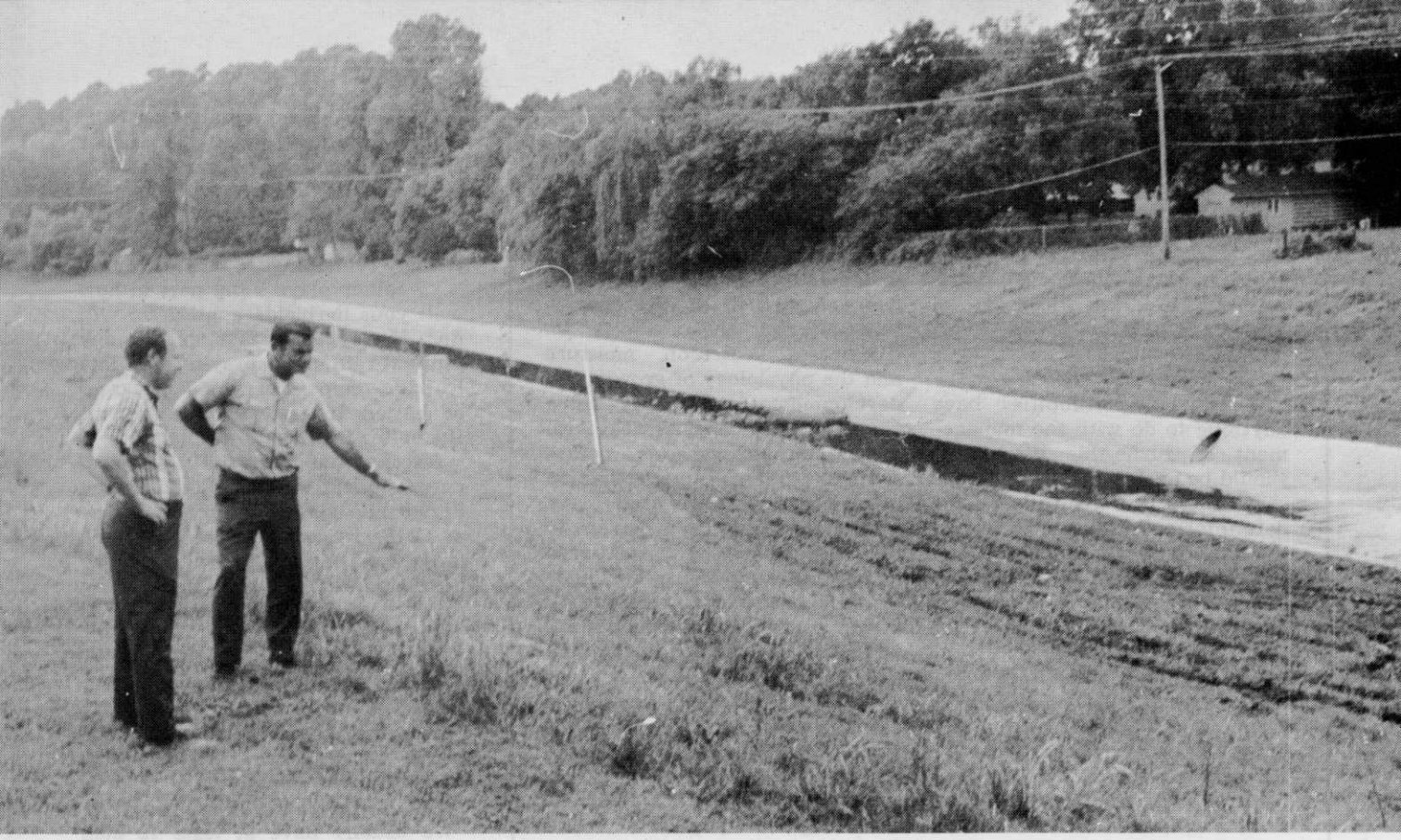


Bermudagrass is taking over. Jim McCoy, right, shows the results to Bill Mosley, Diamond-Shamrock Chemical Co.

growth removal," McCoy explains. "We work within a 300-mile radius of Shreveport, and this includes 300 miles of drainage ditches in Caddo Parish, more than 300 in Bossier Parish and 500 miles of ditches in Tennesaw Parish."

Most of CMI's work is on a year-to-year contract basis, McCoy says, although they prefer to work out long-term contracts where they can do a regular removal job. "Actually," he explains, "we don't do ditches every year anyway; most are cleaned up every two to four years. Where we have long-term contracts with such groups as Parish Levee Boards, we may handle half of their levees and ditchbanks each year, keeping growth minimal and costs down."

Those people responsible for the maintenance of the levees and drainage ditches recognize weed and underbrush control as a necessary expense. If cultivated land is to be kept as free of weeds as possible, the ditchbanks and levees also have to be prevented from becoming weed-seed breeding grounds. Also, says McCoy, weeds and vines don't hold soil on a steep ditchbank like grass does, and it is necessary to get rid of the weeds for the bermudagrass to take over. "It costs a lot of money to dig ditches, and it's all wasted if a ditch gets clogged."

CMI's performance is measured in terms of percentage of kill, so the firm has to kill **all** trashy vegetation. Governmental boards don't want to know about the weeds a herbicide doesn't get—they want to see the weeds cleaned out—period.

"Trees and woody underbrush are our biggest problem when it comes to permanent kill," McCoy says. CMI's tree removal technique involves injecting each tree with Croprider 2,4D amine, using a 2-inch pipe with a bit on the end and a pump as an injector. "We make a cut every two inches around the tree as close to the ground as possible," McCoy says. "It really does the job on willows and cottonwoods, although it's a little less effective than some other, hotter herbicides on hardwoods."

For general weed control on ditchbanks, CMI usually works with Daconate, Diamond Shamrock Chemicals' premium MSMA-surfactant formulation. The usual rate is about ¾-gallon of material per acre. "We really would like to combine the Daconate with a 2,4D for a really total kill," says McCoy, "but we're concerned that fumes from the phenoxy will get us in trouble with neighboring cottonfields or home gardens." One answer to that problem that McCoy is looking into is Dacamine, Diamond's completely non-volatile phenoxy.

A typical job for CMI is the Bayou Pierre ditchbank maintenance job. Awarded the contract to keep this ditchbank, which winds through much of metropolitan Shreveport, free of noxious weeds, CMI found the weeds really growing rankly all along its length.

It would be some job—"The rough grasses like johnsongrass and other weeds were 2½ feet tall in most places," McCoy exclaims. "We saw some bermudagrass growing in spots among the weeds, and felt if we could get the big weeds down the bermuda would come in and choke out most further weed growth."

Use of standard 2,4D materials alone or in combination with arsonates was out of the question, because the ditchbank backs up on some of the finest homes in the city, with their beautiful and highly susceptible expensive shrubbery.

Where it was possible, CMI went in with a tanktruck, spraying Daconate through a 30-foot boom. "We used a real high pressure — 400 pounds per square inch—to try to get a fine mist and high-saturation coverage, since Daconate is a contact herbicide and we needed as much contact as possible," McCoy says. Where the truck couldn't go, a long hose and hand-held nozzle was used to wet down every weed they could spot. Rate was about 60 gallons of spray solution per acre.

"Our plan," McCoy continues, "was to hit the ditchbank twice this year. First we sprayed it in the latter part of May when the temperature was up. Then we came back in the heat

BOOK REVIEW

TURFGRASS SCIENCE, published by the American Society of Agronomy, 677 South Segoe Rd., Madison, Wis. 53711. Hard cover. Regular, $12.50; ASA members, $10.

If your responsibilities have anything to do with the management of turf, this new book should be on your shelf. Two reasons: There is a wealth of up-to-date information in the book, and the list of two dozen authors is priceless when the future produces a problem on which you need an authority's advice.

Turfgrass Science is No. 14 in the Agronomy series. Twenty-eight chapters total 715 pages. The editors are A. A. Hanson and F. V. Juska, Forage and Range Research Branch of USDA's Agricultural Research Service at Beltsville, Md.

"This monograph brings together the best thinking in turfgrass science," states Werner L. Nelson, president of the American Society of Agronomy, in the foreword.

Chapters cover the history, climates and varieties. There is in-depth discussion of soil characteristics and their effects on turfgrasses. Nutrition, moisture and the physiology of growth and development range over three chapters. Four chapters deal with weeds, diseases, insects, nematodes and other pests. Production of seed and sod is covered.

Special attention is given to turfgrass ecology as it relates to climatic regions. There is a chapter each on turfgrass under cool, humid conditions; warm, humid; and semi-arid and arid. Chapters deal specifically with major areas of turfgrass uses, such as athletic fields, putting greens, golf fairways, tees and roughs, and highway roadsides.

The final chapter on commercial turfgrass equipment, covering 20 pages, is current enough to have been written from new product releases.

of August to get whatever young weeds sprouted since the earlier spraying." McCoy figures that two years of this program will clean up enough noxious weeds so that the bermuda will come in and choke out any remaining.

"Weather plays a big part in how well your herbicide application will do," McCoy adds. "We need a day without rain after spraying, and like to have temperatures of 75 degrees or better. In fact, the hotter it is the better it works.

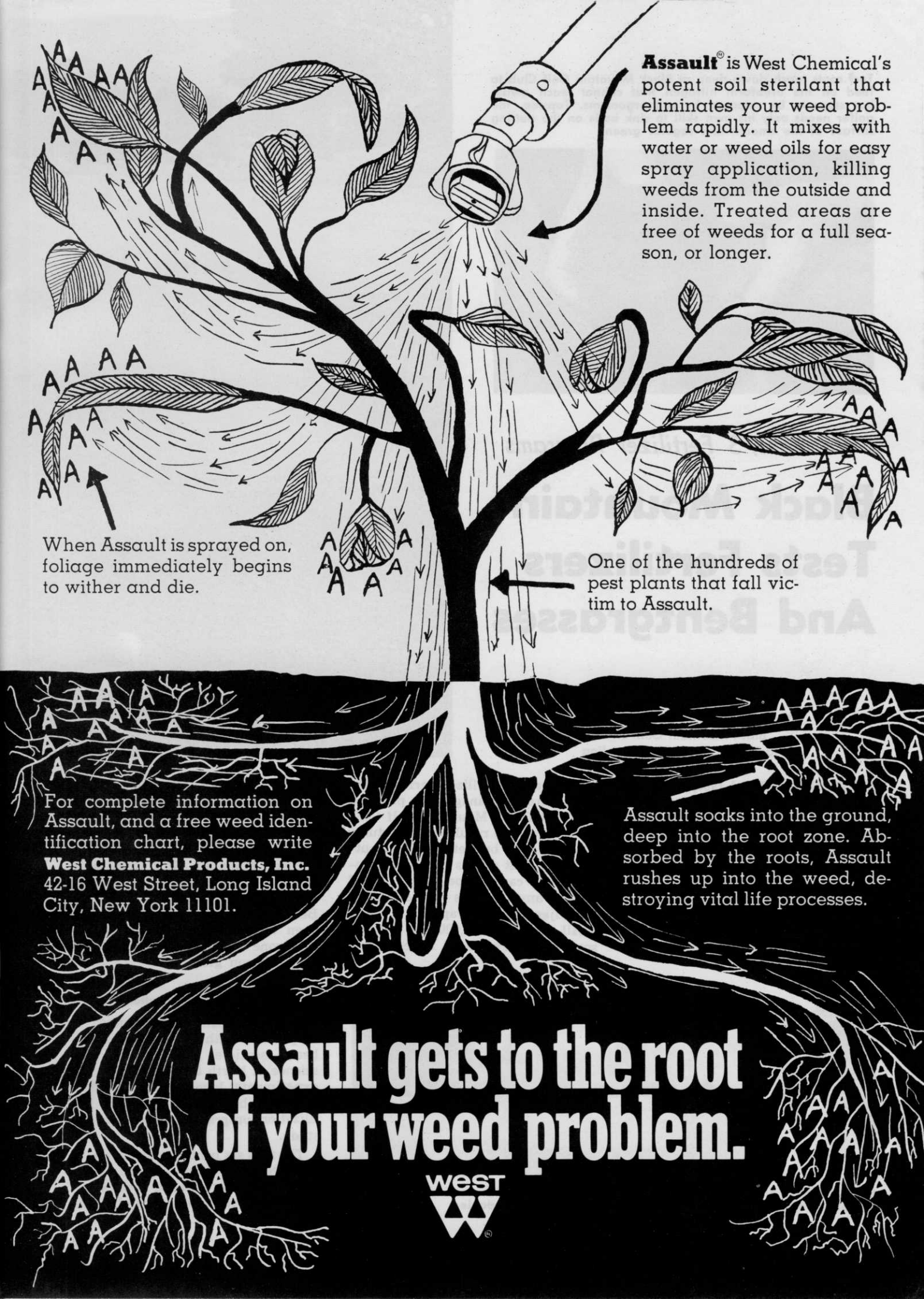
Checked out after the first Daconate application, the Bayou Pierre ditchbank showed ample evidence of CMI's success. Almost all of the tall, waist-high johnsongrass was gone, and bermudagrass was coming in strong. "That bermuda looks great," McCoy exulted. "Bermuda likes hot sun, light, water and nitrogen, and the johnsongrass was stealing all that until now."

Running five spray units, plus one barge to use in riverbank spraying, CMI handles something like 1,000 acres of weed-control work a year. "We usually have at least 12 men on the payroll year-round," McCoy says, "but during peak season we often go as high as 35 to 40."

It's a big job, keeping lowland Louisiana from reverting to a jungle.

For More Details Circle (135) on Reply Card

For More Details on Following Page Circle (128) on Reply Card



Assault® is West Chemical's potent soil sterilant that eliminates your weed problem rapidly. It mixes with water or weed oils for easy spray application, killing weeds from the outside and inside. Treated areas are free of weeds for a full season, or longer.

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WEST

Turf roots reach down deep at Black Mountain Golf Club to feed on the ureaform nitrogen that cannot leach away, but stays to be released by soil organisms. Topside, the golfer needs only his own skill to sink balls on the putting surface of the smooth and regular green.

8 Varieties, 3 Fertilizer Programs

Black Mountain Tests Fertilizers And Bentgrasses

By ROSS TAYLOR
Superintendent, Golf Professional
Black Mountain Golf Club
Black Mountain, North Carolina

BETWEEN 1962 and 1966, we made a comparative study of the response and adaptation of eight bentgrasses to three fertilization programs. This report has been prepared for the benefit of the golf superintendent and turf management specialist who may not have an opportunity to conduct such a study. We hope it will serve as a guide to those interested in choice of bent species as well as in fertilizer performance.

Our greens management program today at Black Mountain Golf Club is based on the results of this study. And since our budget is modest, outstanding bent greens is our one feature that can compete with golf courses anywhere, as can be seen by the adjacent photograph.

All greens of 9,000- to 10,000-square-feet are seeded for economic reasons, and now our choice is Seaside or Penncross. The smaller greens are vegetatively propagated; C7 Cohansey and Old Orchard have proved the most reliable for this purpose.

Black Mountain Golf Club is 15 miles east of Ashville, N.C., where the average elevation is 2,250 feet. Bentgrasses do well in this climate, even though we are in the transition zone between cool-season and warm-season grasses.

Superintendent Ross Taylor stands on the fairway of what he believes to be the longest hole in the world — Number 17, a 745-yard, par 6 dogleg.

Experimental Plot Preparation

The test work was conducted in cooperation with Dr. William B. Gilbert, associate professor of crop science at North Carolina State. The experimental layout (Page 27) identifies the bent species and the fertilization programs included in this study.

The first six bentgrass species have to be vegetatively propagated; Numbers 7 and 8 are seeded species.

The plots were very carefully pre-

pared to assure uniform results. The soil was disked and harrowed before adding the sand and Turface. Turface was added at the rate the soil analysis indicated, and was worked into the plots using a rototiller. The ground was then raked, leveled, and rolled to firm up the soil before planting. Lime was spread at the rate of 100 lbs. per 1,000 square feet.

The powder type of ureaform fertilizer was applied by a mechanical spreader rather than the usual spray method. We believe that this gives more uniform coverage. The sprinkler was then used to wash the fertilizer into the soil. Fertilizer programs B and C were applied in the normal way. The three types of applications permitted us to evaluate difference in direct application vs. use of balanced fertilizers and the merits of monthly application vs. two applications annually.

Eight weeks after planting, difference in coverage by the various grass strains was becoming apparent. (See bottom left, Page 27.) On the left is Penncross; in the middle is C52 Old Orchard; and on the right is C50 Washington. Ten weeks after the plots had been planted or seeded the grass species showed good coverage.

During the five-year period of this study, annual soil tests were made to keep the proper balance of N, P, and K, and to maintain the correct pH. The plots were observed with regard to the weather, disease, and wear resistance of the various species.

The plots were mowed at 3/16 to 1/4 inch four to five times a week during the growing season. When rain was insufficient for moisture requirements, the plots were watered on the same basis as the regular greens. Other cultural practices such as aeration and/or verticutting were not followed because we wanted to keep the species confined to the designated plots.

Weeds were not much of a problem. The fertilizer programs kept most of the turf plots thick enough to prevent weed seeds from germinating. Where weeds or crabgrass appeared, they were removed by hand.

There was an annual disease control program for the plots. We applied fungicides such as mercury, Thiram, Tersan, Captan, P.M.A.S., or iron, or a combination of these, as a preventive when weather conditions were right for disease to develop. They were used as a corrective measure when disease appeared.

Since we did not observe any insect damage in these plots and no serious infestations occurred in the area, no insecticides were applied.

Five-Year Summary

A summary of the five-year results with the various turf strains follows:

1. C7 Cohansey and C15 Toronto showed exceptional weather, disease, and wear resistance in all plots, as did the Penncross and Seaside strains.

2. C1 Arlington and C52 Old Orchard were very satisfactory in all plots.

3. Washington C50 showed up poorest of the eight species. Verticutting and additional fertilizing might have improved the performance.

4. The uniform growth of the three replicates of the C1-C19 Arlington and Congressional was very significant in the plots where powdered ureaform (Plot A) was used. There

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was no separation in these plots, as usually occurs with mixed species, but strains were completely separated in the plots receiving the other fertilization programs (Plots B and C). This difference was noticed after the first year of growth.

Significant Observations

Over this five-year period the following significant observations were made with regard to the various fertilization programs.

1. In the spring Plots A and C always looked better than the plots B. The powdered ureaform Plots (A) always stayed greener longer in the fall.
2. All plots looked extremely good in the middle of the summer and in early fall.
3. The species in the plots that received the ureaform fertilization programs recovered from disease attack quicker and with less reduction of vigor.
4. One of the most interesting observations (See bottom right.) was to see the powdered ureaform plots real pretty and green when the temperature was 7 below zero!

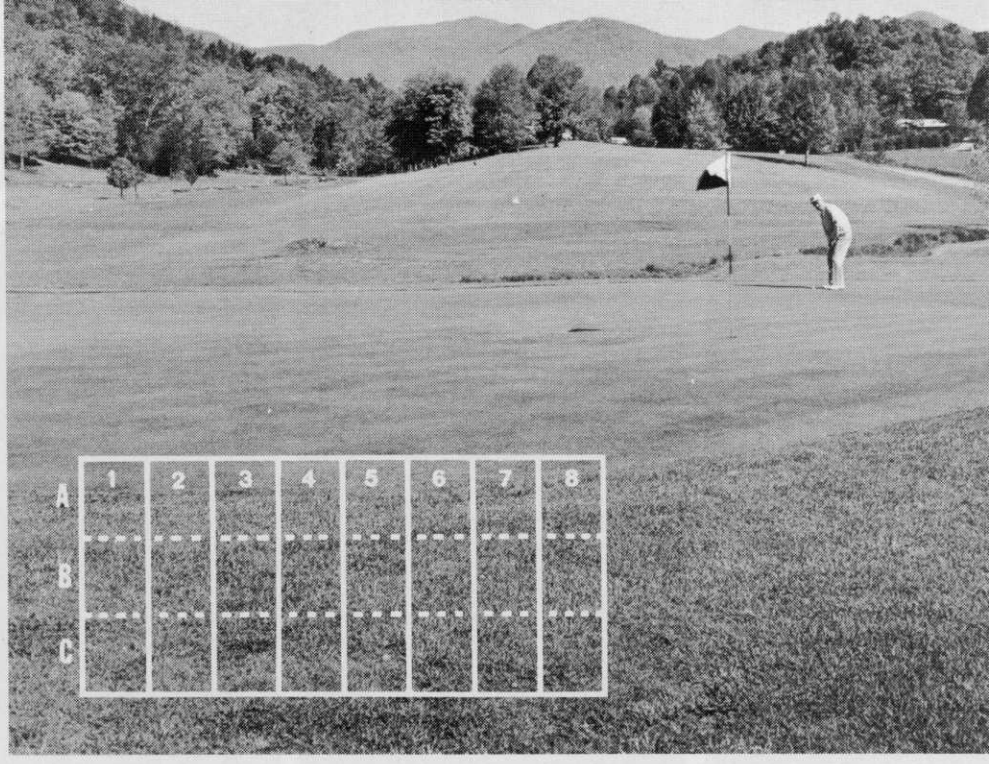
Program Recommended

After evaluating these results and analyzing our economics, the turf maintenance program outlined below is followed for all 18 greens to keep them healthy with good color.

1. The Seaside species was selected for use on the larger greens that are seeded at Black Mountain. C7 Cohansey and Old Orchard are the choice for vegetative propagation.
2. Based on our soil analysis and the nutrient removal, we know we need a 4-1-2 fertilizer ratio.
3. Based on this fertilizer study, we selected a 16-4-8 with 60% ureaform nitrogen, and apply annually 10 to 15 lbs. of nitrogen/1,000 square feet to greens.

We make only three applications a year to greens with the first about April 1 (12-15 lbs.), the second (10-12 lbs.) about May 30, and the final application (20-25 lbs.) between Sept. 1 and 5. This third application is the heaviest to be sure to have good nitrogen residual to carry us into the next spring.

4. Proper cultural practices are also followed which include regular mowing at the proper height, and aerifying and/or verticutting.
5. On our bluegrass fairways we use a 12-4-8 (with 60% N from ureaform) and apply 300 lbs. per acre in the spring and 400 lbs. per acre in the fall.

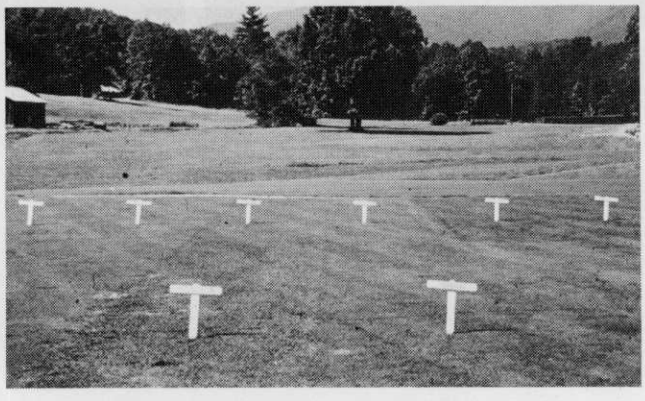


Black Mountain's bentgrass experiment setup is superimposed above (not the location) showing three replications of eight bentgrasses. The plot size was 5x32 feet. Strains were: 1—C1 Arlington; 2—C7 Cohansey; 3—C15 Toronto; 4—C50 Washington; 5—C52 Old Orchard; 6—C1-C19 Arlington and Congressional; 7—Penncross; and 8—Seaside. Fertilization: Nitrogen, 10 lbs./1,000 sq. ft. annually. (A) Powder-type of ureaform: 6.5#N/1,000 sq. ft. 38-0-0; 15#/1,000 sq. ft. 0-10-20 in spring; and 3.5#N/1,000 sq. ft. 38-0-0; 15#/1,000 sq. ft. 0-10-20 in the fall. (B) Activated sewage sludge plus 3#KC1/50#, monthly applications April through October. (C) 10-6-4 commercial product with 60% N from ureaform, monthly applications April through October. The ureaform used in these experiments was "Powder Blue type of Nitroform"; the activated sewage sludge was "Milorganite."

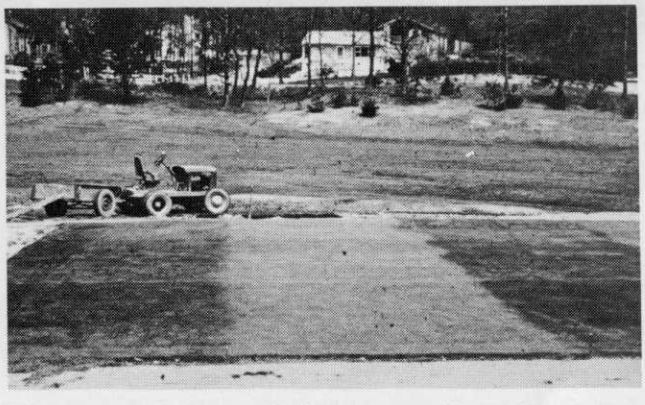
Home Irrigation Guide Available From Buckner

A brochure for planning a home lawn sprinkling system is available from Buckner Sprinkler Co., Fresno, Calif.

Called "Six Easy Steps to Permanent Home Irrigation," the brochure covers design of an underground sprinkler system, sprinkler head positioning to insure uniform watering, pipeline layout, material needs, installation directions, and conversion to automatic controller operation. For more details, circle (712) on the reply card.



Experimental plots showed this good coverage in 10 weeks. Stolons were topdressed after first cutting.



Temperature: 7 degrees below zero! Darker color of ureaform plots indicates superior cold weather resistance.

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a chance and it'll grow on you.

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GUIDELINE SPECIFICATIONS soil preparation and sodding

"Turf quality and performance on sodded areas depends on a number of closely related and interdependent factors. These include the selection of adapted turfgrasses, adequate preparation of site, proper installation of sod, and good management practices which will result in fast establishment and good growth of the turf."

This paragraph is contained in the introduction of a publication entitled "Guideline Specifications: Soil Preparation and Sodding" and published by the University of Maryland and Virginia Polytechnic Institute.

"Although this publication has been available for only about six months, we are already seeing tremendous benefit from it," reports A. J. Powell, turf specialist from the University of Maryland.

"Contractors and architects are very interested, and are using all sections or those sections which apply to their project. This will definitely help to improve turf quality and performance.

"As far as we know, these were the first specifications published in the U.S. for this purpose."

Close behind the Maryland-Virginia specifications has come the announcement that a similar guide is available for the Midwest. At its January annual meeting, the Midwest Turfgrass Growers Association announced that a booklet by the same title was being published.

The table of contents of the Maryland-Virginia guide is reproduced to give a quick idea of what is contained in the specifications. The outline is helpful for other sod producers' groups who might want to draw up specifications for their regions. The Virginia-Maryland guide is available for 15 cents by writing the agronomy departments of the respective universities.

The guide is divided in such a way to allow maximum flexibility for architects and contractors. Each

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