Southern California Turfgrass Culture

JULY 1959 VOLUME 9– NUMBER 3

CHEMICAL CONTROL OF FLOWERING OF *PENNISETUM CLANDESTINUM*, KIKUYUGRASS

J. R. Goodin, Research Assistant

The continuous uncontrolled spread of *Pennisetum clandestinum* has called for increased interest in attempts to find some means of control, or at least inhibition. Most of the work up to this date has been in the control of vegetative growth. It has been well established that kikuyugrass also seeds freely, and often invades new areas through seed distribution (Youngner, 1958).

Small patches of kikuyugrass are frequently observed within a half mile or more radius around established kikuyu turf. The new patches very likely may have developed from seeds produced in the old turf. Even though it may be impractical to attempt killing a large area serving as a source of infestation, it certainly would be desirable to restrict its spread. The use of chemicals which will prevent flowering and seeding may be a worthwhile approach in such a control program.

With these points in mind, an attempt was made to control flowering with a series of promising chemicals. Maleic hydrazide (MH-40), l-Naphthaleneacetic Acid, (NAA) 5 OH carvacryl, trimethyl ammonium chloride, l-piperdine carboxylate (Amo-1618), Tris-(2,4-dichlorophenoxyethyl) phosphite (Falone), and 2, 4, 5-Trichlorophenoxyacetic acid (2, 4, 5-T) were chosen for this purpose.

Procedure

Four-inch plugs were cut from a *Pennisetum clandestinum* turf and grown under greenhouse conditions in five-inch clay pots. Four replications of three concentrations of each chemical were arranged in a random block experiment. Each pot received approximately two ml. of a specified concentration applied with an atomizer at weekly intervals. Flowers were found to last from one to two days, so that observations were made every other day. Total number of flowers per pot were recorded, which gave a rather accurate account for the total number of flowers produced during the observation period.

Results and Analyses

All concentrations of MH-40, NAA, and Falone produced significantly fewer total numbers of flowers than did the controls. Higher concentrations of 2, 4, 5-T also gave inhibition; and, in fact, death occurred at the 2500 ppm. concentration within three weeks. The 20,000 ppm. concentration of Falone also caused death within three weeks. Amo-1618 at the high 3000 ppm. concentration gave even greater flowering than did the control.

MH-40 and NAA at a medium (100-200 ppm.) concentration produced almost a complete inhibition of flowering, with relatively little if any damage to vegetative growth. All concentrations of MH-40 did produce a darker green color, and heavy anthocyanin formation was evident in the high concentration. Stunting was too severe in the 2000 ppm. concentration, and presumably repeated applications would cause death.

The lack of effectiveness of Amo-1618 was quite evident. The vegetative growth was of a brighter green color than that produced by the control or any other chemical tested. This chemical might be tested further for improvement in quality of desirable turfs.

From the standpoint of eradication, 2, 4, 5-T at 2500 ppm., Falone at 20,000 ppm., and maleic hydrazide at 2000 ppm. seemed to be most effective.

Conclusions

All chemicals tested, with the exception of Amo-1618, caused a significant inhibition of flowering. This method may possibly be used in the future to control the spread of kikuyugrass, although its use for eradication is limited in almost the same manner as that of a soil sterilant. Perhaps further testing can develop a concentration of a chemical which will gradually eliminate the kikuyugrass without appreciable damage to the desired species.

References

Youngner, V.B. Kikuyugrass, *Pennisetum clandestinum*, and its control.
Southern California Turfgrass Culture 8(l): l-4, 1958.

[1] ***Research Assistant, Department of Floriculture and Ornamental Horticulture, University of California, Los Angeles.***

Table 1. Total Number of Flowers Produced per Plant after Application of a Chemical Control.		
Chemical	Concentration	Total No. of Flowers per Plant(x)
Maleic hydrazide MH-40	500 ppm. 1000 ppm. 2000 ppm.	15.50 • * 7.00 ** 1.00 **
l-Naphthaleneacetic Acid NAA	20 ppm. 200 ppm. 2000 ppm.	67.25 ** 14.75 ** 3.25 **
5 OH carvacryl, trimethyl ammonium chloride, I-piperdine carboxylate Amo-1618	1000 ppm. 2000 ppm. 3000 ppm.	140.00 n.s. 166.76 n.s. 207.00 n.s.
Tris-(2,4-dichlorophenoxyethyl) phosphate Falone	5000 ppm. 10000 ppm. 20000 ppm.	107.75 ** 35.25 ** 10.75 **
2,4,5-Trichlorophenoxyacetic acid 2,4,5-T	25 ppm. 250 ppm. 2500 ppm.	141.75 n.s. 18.75 ** *** **
Control – No chemical		176.66
• * Significant at 1% level n.s. Not significant		

SOME QUESTIONS ABOUT IRRIGATION *

Does it make any difference bow fast or slow water is applied so long as the correct total amount of water is provided?

The nature of the soil and the amount of slope will dictate the rate at which water may be applied. It has been observed that some workmen irrigate until the water stands on the surface. When such a practice is followed, the rapid application of water might result in standing water at the surface before the soil is thoroughly wetted. On the other hand if water were applied slowly, it is possible that a soil might become completely saturated before any water would stand at the surface. One should always be sure that he is not applying water faster than it can enter the soil. Thus runoff can be avoided and water infiltration in high and low areas will be more uniform.

HOW much water sbould be applied at one time?

Enough water should be applied to restore the soil to "field capacity." In other words, provide as much water as the soil will hold after thorough drainage. On the other hand, do not apply more water than the soil can hold against the forces of gravity, because drainage may not be adequate and "water-logging" of the soil is the result. No one can say just how much water is "enough" unless he has a great deal of experience with a given soil. Soils are capable of holding varying amounts of moisture against the pull of gravity. It is believed that the water man who depends upon a probe or small soil sampling tool will be more nearly able to judge the correct amount of moisture.

Why does turf sometimes wilt on a hot afterwhen the soil appears to be wet?

Passage of water from the soil into the roots and up through the plant to the leaves requires a little time. When water is being transpired rapidly by the leaves, there may be a lag between the demand and supply. Overly wet soil sometimes contributes to this condition. Too much water in the soil prevents adequate diffusion of oxygen into the root zone. In a situation where oxygen is lacking roots cease to function properly and they may fail to take in water at a rate sufficient to supply the leaves of the plant. This kind of situation is one in which "syringing" or "showering" is needed. Water applied as a fine mist will cool the turf and prevent wilting. The object is to apply some moisture to the turf but not to the soil which is already too wet. This is the basis for the statement frequently made by agronomists, "When you shower a green, the object is to wet the grass but not the soil."

*REPRINTED FROM UNITED STATES GOLF ASSOCIATION GREEN SECTION SOUTHERN TURFLETTER NO. 3, JUNE 1959.

PREVENTIVE MAINTENANCE OF POWER EQUIPMENT

William D. Goodrich
Pacific Toro Company, Inc., Los Angeles

Are you getting your money's worth from your grass-cutting equipment? If you stop to think a few minutes, you might be surprised to learn that you don't know the answer to this vital question.

Machines that wear out prematurely through improper care and maintenance cause unnecessary increases in parts and maintenance costs. The improper machine for the job and abuse will result in early replacement of the equipment.

Here's a simple formula which might help you determine whether or not you are getting your money's worth from your mowing machinery. Machinery operating costs=

$$\frac{\text{Original cost + Repair costs}}{\text{Operating Time}}$$

Let's examine this formula. Why does a tractor cost so much money and still need repairs and replacing? Actually, they cost around $2,600.00, which is about the same as you pay for a medium priced car, less accessories. On the average, you turn that car in at 30 to 35,000 miles. What happens to the tractor during its life-span? Tractors usually run about 7 hours a day and 5 days a week. This totals to about 1,820 hours per year. When pulling gang mowers, the tractor travels approximately 5 m.p.h. which equals 9,100 miles per year. However, tractors pull mowers in second and third gear.

Tractor time in third gear (70% or 1,274 hrs/yr. @810 r.p.m.)
Tractor time in second gear (30% or 546 hrs/yr. @ 1480 r.p.m.)

If you combine the engine speed with the hours run in each r.p.m. category and apply the result to an average (high gear) of an automobile, the net result will be equivalent to more than 40,000 miles per year. If tractors are used for 5 years this is equivalent to 200,000 miles. The $2,600.00 tractor now appears to be doing its share for the budget.

Well, maybe the above is true, but $395.00 for the 21" Power Greensmower sounds high. And besides, we are always buying bedknives and bushings for it. Statistics for Greensmowers are of little value unless applied in such a manner that they compare against some other piece of equipment. Greensmowers actually run substantially more than you might think.

a. Five cuttings per week @ 3 hrs. per cutting equals 15 hrs. per week.
b. Fifty-two weeks per year of cutting equals 780 rolling operative hours per year.
c. At an average mowing speed of 3 m.p.h. the mower travels a total of 2,340 miles per year.

These rolling 2,340 miles mean actual operating wear. If we adjust downward 10% for transporting purposes – green to green, the following figures begin to come to light:

a. 2,106 operating miles means the reel bearings must deliver accurate to within .002" some 15,899,600 revolutions per year.
b. The bedknife receives 111,196,800 cuts per year and a lot of that cutting is being done under wet, and sandy, hot and dry conditions, not to mention loose spikes dropped from some member's golf shoe.
c. The front rollers, which are constantly being exposed to sand and grit, along with the corrosive effect of chemicals, must deliver to within 1/64" accuracy some 4,410,984 revolutions.

Assuming that your department has six power Greensmowers, we multiply the above unit statistics by six and an obvious pattern of wear shows up. Six Greensmowers cost approximately $2,400.00. This is nearly the same cost as that $2,600.00 tractor. However, the 6 Greensmowers travel a total yearly mileage of 14,040 or nearly 5,000 more miles than the tractor (actual rolling miles) or about 35% more mileage than the tractor.

These figures are quite realistic and certainly give us an idea as to the type of performance that is expected of your equipment. Building this performance into mowing machinery is the manufacturer's job. Manufacturer's experimental and product engineering departments are continually striving for QUALITY-PERFORMANCE AND LONGEVITY. They subject the machines to many tests such as:

Dropping them from various heights, driving them down flights of steps, mowing nails with reel mowers, mowing down 2 x 4's with rotarys as well as regular grass mowing.

Ask yourself, "ARE WE GETTING OUR MONEY'S WORTH?" We don't know until we look at repair costs.

During the last war, it was discovered that automobiles would perform for several thousand miles more than was anticipated. Prewar cars were junked at 30 to 35,000 miles. These same cars were run 100,000 and more miles when it became necessary. This, of course, was due to proper care and maintenance. The same is true with grass cutting machinery. Naturally, there are certain moving parts that are going to wear out, but we can offer suggestions to help prolong their life. These suggestions are for the most part outlined in the Owner's and Operator's manual, which comes with each machine.

We have outlined procedures which, if followed, will assist you in prolonging the life of your equipment. Bear in mind that these suggestions are not only our suggestions, but are an association of ideas picked up in our travels among customers throughout the country.

A. Daily checks
   1. loose bolts and nuts
   2. belts and chains
   3. cleaning mowers

B. Lubrication
   1. oil level and air cleaners
   2. zerk fittings
   3. check gear case levels

C. Adjustments
   1. follow factory recommended procedures
   2. use correct tools
   3. adjust according to weather conditions
   4. make adjustments regularly

D. Training of operators
   1. difference in operators exist
   2. give correct instructions through demonstrations
   3. correct operational methods will cut down operating time
   4. induce personal pride

DAILY CHECKS

Part of the operators job should include a daily check of his entire machine.

1. Check for Loose Bolts and Nuts

Loose bolts and nuts, if ignored, can cause considerable damage. Holes become enlarged or elongated due to vibration which causes excessive motions. Studs and fasteners, when lost on the machine are usually found again between the bed knife and the reel. As a specific example, while visiting one of our distributors, a call was received by the service department stating that an engine had burned out during the warranty period. It seems that the revolving screen which rotates with the engine crankshaft loosened and made considerable noise. Its function is to keep grass clippings from clogging the air passages between the engine shroud and fins on the cylinder. Instead of having the screen fastened securely it was removed and in a relatively short period the engine required a complete overhaul. Needless to say it was not done under warranty.

2. Check Belts and Chains

Belts should be checked for grease, grass and dirt. Care should be used in the adjustment of belt tension. It is possible to adjust the belt too tight. This is a very important factor in that a tight belt puts a terrific strain on bearings. This will naturally cause excessive wear on bushings and bearings. The belt should be just tight enough for the machine to operate without slipping.

Chains should be checked daily for alignment, proper tension, and signs of excessive wear. Contrary to belief, chains should not be oiled or greased when not fully enclosed. This applies only to grass cutting machinery, of course. Dust, grit, and dirt will adhere to a chain when oiled, acting as a grinding compound accelerating wear of chains and sprockets. To clean a chain, remove from machine and cleanse in a solvent or gasoline. Dip chain in kerosene and hang to dry. I might add that the manufacturers of chains recommend that chains run in an oil spray or bath and that they be fully enclosed. This is impractical on a lawnmower, and we have found that you will experience longer wear with a dry chain.

3. Cleaning Mowers

The operator has not completed his daily task the moment he is finished cutting. The mowers are to be cleaned after each day's operation. This can be done with a low pressure water hose or an air pressure hose. Care should be taken so that water will not hit any vital parts of the engine. As an example, water splashing against a hot cylinder may result in a cracked cylinder. Too much pressure on a water hose will sometimes force water into bearings causing rust. Grease the machine after cleaning to force any water out of the bearings.

4. Proper Storage

After cleaning the mowers it is also important to store the equipment in a good dry equipment shed. Raised flooring is important, particularly in the wintertime. Do not store oil, gasoline, paint or any inflammable material in your equipment shed due to the fire hazard.

LUBRICATION

1. Engine Lubrication

Tied in with your daily inspection is the inspection of the engine. Check the oil level in the crankcase each morning. The oil should be changed every 20-24 hours of operation. A park in Los Angeles had trouble with five large engines. We were called and the information was passed on the manufacturer. A representative was immediately sent because the difficulty was local and not national. The five engines had to be completely rebuilt because the operators had neglected to put in the last pint of oil to fill the crankcase. Check the oil level in the air cleaner daily. Only non-detergent oil should be used. Under normal atmospheric conditions the air filters should be cleaned once a week, and oftener under dusty conditions. When cleaning an air cleaner do not attempt to dry with an air pressure hose. This will tend to create passages in the air cleaner allowing free passage of grit and dirt. Nearly as bad as too little oil is too much oil, as it will tend to splash out if too full. All engine manufacturers publish an operation and service manual which is furnished with your equipment. Consult this manual for complete instructions and follow it faithfully.

2. Zerk Fittings

It has become more or less universal with the manufacturers to publish a lubrication guide in the front of the Owner's operating manual which is supplied with every machine. This will usually inform you as to the fittings needing daily care. There is a tendency to over-grease on many occasions. Grease is put in under pressure and will sometimes drop out on the grass when mowing. In almost every instance the manufacturer will caution you on greasing a bearing where a grease seal is used. Too much pressure will blow these grease seals.

3. Checking Gear Cases

As a rule the gear cases do not need attention required by zerk fittings and engines. Usually about once or twice a season is sufficient for refilling. However, it is important that the correct level is maintained for adequate lubrication. Oil level plugs should be removed occasionally and checked.

ADIUSTMENTS

1. Follow Factory Recommended Procedures

Included in the Owner's manual is a suggested procedure for making adjustments. In almost every instance the engineers who designed a piece of machinery have also drawn up procedures for adjustments. The difficulty is that too few of us read and follow the manuals. It should be standard practice to read and consult these manuals frequently. It will save you time in labor and money in parts.

2. Correct Tools

In the long run it will save money to invest in a complete set of good tools. In some instances the factory makes up special tools to assist in the removal and reassembly of certain parts. Too many times a pair of pliers and a screwdriver are substituted for a correct wrench or tool. Many bolts are sheared with too large a wrench. Carburetor seats are damaged with a large screwdriver used incorrectly. Files, when properly used can smooth out a nick by a stone, but can also result in the need for a complete reel grinding job. I believe we are all guilty of rounding off a hex head capscrew with a pair of pliers. A few drops of penetrating oil, the correct tool, and a little patience will prevent abuse of the machine.

3. Weather Conditions

Varying temperatures have much to do with settings on reel type mowers. As a specific example, when an operator adjusts a mower in the morning the temperature may be in the 60's or low 70's. By noon the temperature may have increased 20 degrees or more. This will cause expansion of the reel which will therefore need adjusting. On fairway units the reel and bed knife should be adjusted as closely as possible without any actual interference. To do this, back the adjusting screws off so that the reel just creases, not cuts, a newspaper. This is about .005 of an inch in thickness. The whirling reel will expand due to centrifugal force by approximately .005 and will be correctly adjusted. In the afternoon the reels may expand an additional .005 and the pressure should be relieved. Usually an 1/8 turn on front adjusting screw will do it. Correct adjustment should allow the reels to turn without binding. This will prevent ripping of bed knives and cut down on sharpening.

Balance rotary type blades after sharpening to prevent shaking the machine to pieces.

4. Regular Adjustments

Have a specific time each day for machinery adjustments. As a specific example, the machines should be adjusted in the morning and immediately after lunch. Observe this maintenance schedule for all operators.

TRAINING THE OPERATORS

Training the operator is another important part of the maintenance program. It is very difficult to get a well-qualified operator these days, particularly when so many individuals do not have a mechanical background. Certain people are hard on machinery. We have this same problem with company automobiles. Two cars may receive the same amount of lubrication and maintenance and yet we get only half as much mileage on one of the cars, simply due to the operator.

1. Correct Instructions through Demonstrations

When new equipment is purchased, a demonstration should be made by some representative who is familiar with the machine. If trouble is encountered during the warranty period, the owner should check with the supplier. Free demonstration and advice from your supplier is available on new or old equipment.

2. Correct Operational Methods

All of you are familiar with time and motion study used in manufacturing. Part of a Time and Motion Engineer's job is to study operational methods to do an operation with the least amount of effort and to save time, the most valuable asset we have. By applying this same technique in grass cutting, it is possible to cut down operating time on machines and still obtain the desired results.

3. Induce Personal Pride

Try to keep the same operator on each machine. This will instill in the operators a certain competitive spirit where they actually "baby" their machines. Once this personal pride is instilled, your maintenance problems will definitely decrease. An incentive will pay off and is cheaper than buying new equipment.

4. Choose the Proper Machine

Many manufacturers get into trouble with customers where the wrong machine has been purchased. In many instances the machine is not designed to do the type of work for which it is being used.

The sales division of the manufacturer investigates the market carefully to determine what machine is needed, the sales potential, and the approximate price the machine should sell for to remain competitive in the market. Money is then allocated in the budget and the engineering takes over. They know the size of the machine and the approximate selling price and with these thoughts in mind the machine is designed and produced.

A small machine is probably used by a home-owner about 6 months out of the year or about 26 weeks with an average use of 2 to 3 hours per week. The machine will last the home-owner perhaps 10 years which means about 800 hours. Running time for an institutional account means about 50 weeks of running and in many instances the machine may be worn out before the warranty has expired because the wrong machine for the job had been purchased.

1. Consider area to be cut. Is it weeds, rough, or hilly? What is the type of grass? You can then decide if a reel type, a rotary type, or sickle type machine is to be used.

2. Consider amount of usage. Perhaps the machine will be used in large extensive areas. Figures are available at your dealers as to the capacity of the various machines. If the machine is to be used for trimming purposes and the usage is not too extensive, a small light-duty machine can be used, but high maintenance costs must be expected.

3. Simplicity of design is very important as a complicated machine has many moving parts and will have a high maintenance cost. Also, it may be difficult to adjust and a trained expert may have to make the adjustments and repairs.

5. Construction and Durability

The machine should be substantially built, well braced with good bearings. The side frames, handles, or drawbars should be heavy enough to do the job. The bed bars, reels, and blades should be rigidly constructed.

In my opinion, a demonstration should be requested by the purchaser. Be certain that the piece of equipment is backed by the manufacturer's warranty and that parts are readily available.

RECENT GIFTS TO THE DEPT. OF FLORICULTURE AND ORNAMENTAL HORTICULTURE. U.C.L.A.

American Cyanamid Company, New York, $350.00.

U.S. Golf Association Green Section, $500.00.

Golf Course Superintendents Association of America, St. Charles, Illinois, $250.00.

Golf Course Superintendents Association of Southern California, $400.00.

The Upjohn Company, Kalamazoo, Michigan, $500.00.

The Zonolite Company, Los Angeles, 4100 lbs. unexpanded vermiculite, 160 cu. ft. graded vermiculite.

Milwaukee Sewerage Commission, Milwaukee, Wisconsin, 1 ton Milorganite

0. E. Linck & Company, Clifton, New Jersey, 1 liquid spreader

Kellogg Supply Company, Los Angeles, 100 cu. ft. Forest humus, 2 tons Nitrohumus.

Wyandotte Chemical Company, Los Nietos, California, 90 bags Zorba11 calcined clay.

The Pax Company, North Hollywood, California, 3 bags Pax crabgrass killer.

0. M. Scott & Sons, Oakland, California, 8 bags Scott's Halt Crabgrass killer, 2 Scott's fertilizer spreaders.

Eli Lilly & Company, Indianapolis, Indiana, $500.00.

Minnesota Mining & Manufacturing Co., St. Paul, Minnesota, $500.00.

Mallinckrodt Chemical Works, St. Louis, Missouri, 6 lbs. Kromad.

Excel Mineral Company, Los Angeles, 1 ton Excel Putt soil amendment.

Summary of Uses of Neburon (Kloben), 50% Formulation, for Turf Purposes in the Northwest*

Roy Goss

The chemical Neburon, now being marketed under the name Kloben, is manufactured by the du Pont Co. Chemically, it is 3-(3,4-dichlorophenyl) l-methyl-l-n-butyl urea and belongs to a group of the substituted urea herbicides.

Some of the favorable aspects of Neburon are:

1. Persists for some time in the soil (somewhat less than a year).
2. Has a high affinity for organic matter; therefore, the higher the soil organic matter, the less the the injury to the grass. (Putting green soils and old lawn soils are usually high in organic matter.)
3. Residual effect in soil is not permanent, since decomposition occurs.

Some unfavorable aspects:

1. It is nonselective if the rates used are high; therefore it must be used with care as is true of most herbicides.
2. It does not dissolve in water but forms a suspension which must be agitated constantly while being used.

Chickweed, both common *(Stellaria media)* and mouse-ear *(Cerastium vulgatum)*. --Apply Neburonto the chickweed any time during the season of rapid growth (May-August) or warm (not hot) sunny days (temperature 85 F or lower). Make the applications at the rate of 4 pounds of 50% active ingredient material per acre, or 1.4 ounces per 1,000 square feet in 5 gallons of water, or 4.1 grams per 100 square feet in 1 gallon of water. (See table of measures below.)

Since spot spraying is usually all that is needed, mix just enough material to wet the leaves of the chickweed. The kill should be complete within a week if weather conditions are good.

Pearlwort, *Sagina procumbens.* --Apply Neburon in the same manner and rate as for chickweed and observe the same weather conditions.

Individual plants of pearlwort are so small that they easily escape detection until they have multiplied into many. Therefore, it is important to extend the sprayed area slightly beyond the observed spot for complete kill.

Black algae.--Algae conditions usually occur in the coastal areas of the Pacific Northwest during the wet winter months and cause a considerable thinning of the turf and promote a scummy appearing surface condition. When the immediate ground surface dries, algae residues form a thin, tough crust which discourages re-establishment of grass in these places until this crust is broken.

A complete control of algae has been achieved on the Inglewood Golf & Country Club in Seattle (Jack Spalding, superintendent), by applying Neburon at the rate of 1 pound of 50% material per acre, or 10 grams per 1,000 square feet in 5 gallons of water. Treatments were made in November and control was complete in December. One application should do the job; however, if a second treatment is necessary, it should be apparent within 3 weeks. This rate of application is very low, hence the toxicity to grass is also very low.

TABLE OF MEASURES FOR NEBURON (KLOBEN) (50%)

1 teaspoon (level) Neburon	1.2 grams
8 tablespoons (level) Neburon..	1 ounce
28.3 grams	1 ounce
455 grams..	1 pound
3 teaspoons..	1 tablespoon

This material is not being recommended by the company for some of these uses, hence they are not liable. Therefore, do not go beyond the rates recommended here unless you are interested in some experimentation on your own.

You will find that by spraying chickweed or pearlwort when the spots are very small some grass is still present and the spots will heal rapidly, but older, large spots have eliminated the grass. Small spots will not have to be plugged out when dead, since the grass will fill in. Kill the large spots with chemical, then plug them out if necessary. This way, you are sure of getting all the weed.

Since these uses have been found for Neburon on turf, it is desirable to make this information available to interested persons in order to lick the three weed problems listed and to insure some degree of safety and accuracy in the use of the material.

***** *Reprinted from Northwest Turfgrass Topics Vol. 1, No. 1. 1959***

SOURCES OF PLANTING MATERIAL OF IMPROVED TURFGRASSES

Requests are frequently received at U.C.L.A. for information on local sources of the new turfgrasses recommended by U.C.L.A. Southern California nurseries are now growing these grasses as described below:

William H. Brown Nursery, 1221 S. Atlantic, Alhambra, California.

Improved bermudagrasses
- U-3
- Ormond (Everglades No. 3)
- Sunturf *(Cynodon magennisii)*
- Texturf 1F (T 35-A)

Cal-Turf Nursery, Box 182, R.R. No. 2, Camarillo, Calif.

Improved bermudagrasses
- U-3
- Ormond (Everglades No. 3)
- Sunturf *(Cynodon Magennisii)*
- Tifgreen (Tifton 328)

Improved creeping bentgrasses
- Old Orchard C-52
- Congressional C-19
- Arlington C-l

Also sod of cool season grasses, Dichondra and mixtures.

California Zoysiagrass Co., 8500 Rosemead Blvd., Pico Rivera, California.

Zoysiagrasses
Tifgreen bermudagrass

NEW PUBLICATIONS OF INTEREST TO THE TURFGRASS INDUSTRY

Grounds Maintenance Handbook by H. S. Conover F.W. Dodge, Corp., 119 W. 4th St., N.Y. 18. Price $10.75.

Land, 1958 U.S.D.A. Yearbook of Agriculture. Supt. of Documents , Washington 25, D.C. Price $2.25.

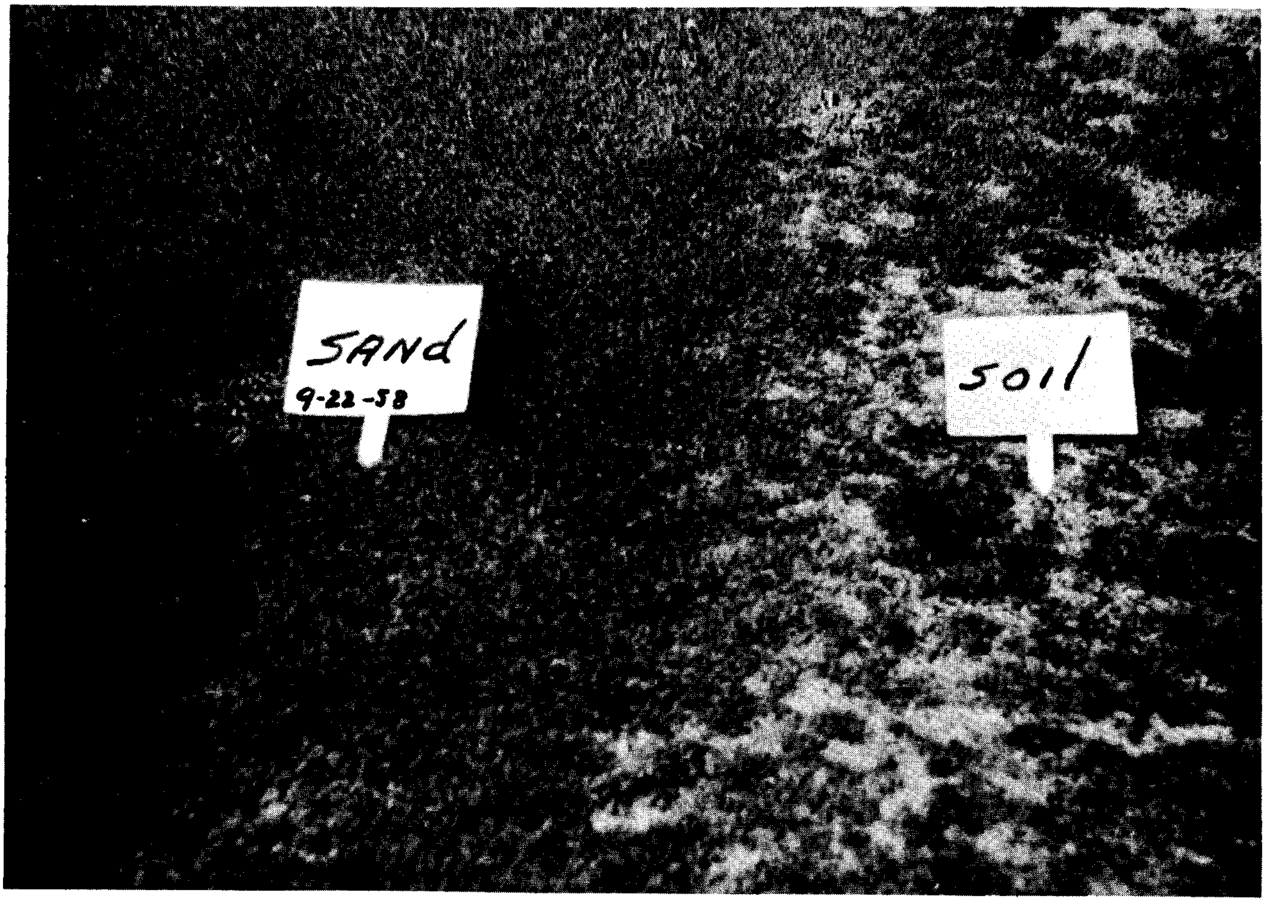
Merion Bluegrass Seed Production by D.C. Sumner, J.R. Goss and B.R. Houston. Calif. Agri. Exp. Sta. Cir. 470. Available from your local farm advisors office.

Controlling Field Rodents in California by T.I. Stover. Calif. Agri. Exp. Sta. Cir. 434 (revised). Available from your local farm advisors office.

New Ideas in Roadside Turf. American Seed Trade Association, 30 North La Salle St., Chicago, 111.

Turf Disease Handbook. Mallinckrodt Chemical Works, Mallinckrodt St., St. Louis 7, MO.

Guide for Preparation of Specifications for Turfgrass Establishment by H.B. Musser. The Pennsylvania Turfgrass Council. Tom Mascaro Secy., West Point, Pa. Price $ .50



RECOVERY OF DISEASED TURF GROWN ON SAND AND HEAVY CLAY SOIL

During August of 1958 disease, principally Helminthosporium, attacked the sand green at U.C.L.A. This 5-year old experimental green of Seaside bent is grown on plots of 2, 4 and 6 inch layers of sand and on the native soil which is a heavy clay. Disease was severe on all plots. Following applications of Kromad recovery was rapid on all sand plots but extremely slow on the plots of clay soil. In a few weeks time no injury from the disease could be seen on the sand plots, while thin or dead areas were still evident on the clay plots as late as December.

This publication "Southern California Turfgrass Culture" is sponsored by the Southern California Turfgrass Council and is currently financed through funds raised by the Southern California Golf Association. Communications should be sent to the editor, Dr. Victor B. Youngner, Department of Floriculture and Ornamental Horticulture, University of California, 300 Veteran Ave., Los Angeles 24, California.