

Southern California Turf Culture

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THE USE OF 2,4, 5-T FOR CLOVER CONTROL IN TURF

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Many of the current turf management practices of today tend to encourage the growth of clover in turf. The close cutting, excess watering, weed removal, low nitrogen feeding, disease attacks, turf cultivation, crabgrass control and compaction all may indirectly favor clover infestations. Under lawn conditions, particularly with bluegrass, it is hardly possible to fertilize heavily enough with nitrogen to prevent clover infestation.

Considerable success in clover control has been obtained by using one to three pounds per acre of sodium arsenite as a weekly spray to repeatedly defoliate and weaken the clover, particularly as winter approaches. By the same treatment, chickweed and *Poa annua* may be greatly reduced. Research by Nutter and Cornman of Cornell University showed good results with Endothal, a product now on the market. Both Endothal and the sodium arsenite give temporary leaf burning to the turf.

In 1951, several turf superintendents in the Chicago area began using a mixture of 2,4,5-T (2,4,5 Trichlorophenacetic acid) and 2,4-D (2,4 Dichlorophenacetic acid) for clover control. This report is a summary of various tests conducted at Purdue University using 2,4,5-T for clover control. Fairway plots, located on the Purdue Golf Course, sprayed with 2,4,5-T in June, 1951, at the same time as various rates of Endothal were used, have shown definitely lesser clover percentages than those treated with Endothal during the following year. Where one pound of 2,4,5-T acid equivalent was used, there was less than 2% clover one year after treatment compared to 25% for untreated areas.

We have tried fall and summer clover control on a practice putting green through cooperation with the Elks Country Club of West Lafayette, Indiana. The presentation of these results is not to be considered a general recommendation for its use but to suggest it as a possibility when management has allowed clover infestations. One quart of 2,4,5-T solution, or one pound of acid equivalent, applied on October 10, 1951, gave an estimated 95% control of existing clover within one month,

while a mixture of one quart 2,4,5-T and one pint of 2,4-D, one-half pound acid equivalent, gave 98% control. On April 23, 1952 or later that year no clover could be found on either treated area. Lesser rates were only partially effective.

On June 16, 1952, applications of .75 pound, .5 pound and .25 pound per acre of 2,4,5-T and .5 pound 2,4,5-T plus .25 pound 2,4-D were used on the north half of the Elks Country Club practice green. Temperatures for the following two weeks were high, up to 100' F., with very high humidity. There was considerable reduction in the vigor of the bentgrass, but no extended injury, and it responded to nitrogen applications made five days after spraying. The summer applications gave only 90% control of the clover and regrowth began before fall.

On June 18, 1952, three grasses maintained as lawn areas—Merion bluegrass, F-74 fescue and Astoria bentgrass—were treated with 2,4,5-T alone and in combination with 2,4-D. Table 1 shows that clover in bentgrass was reduced from 18% of the turf to 2% by a summer treatment. This table also shows that the vigorous Merion bluegrass was restricting the invasion of clover. Considerable regrowth has taken place on these plots during the fall of 1952.

TABLE 1
PERCENT OF CLOVER IN TURF ON JULY 18, 1952
WHICH WAS SPRAYED JUNE 18

Gasses	1.5 Pts.* 2,4,5-T/A	1 Pt. 2,4,5-T&* .5 Pt. 2,4-D/A	None
Marion bluegrass	0.5	1.5	10
F-74 fescue	2	4	17
Astoria bentgrass	2	2.5	18
Unseeded	3	3	36

* 1 qt. of both materials is equal to 1 pound of acid.

In the fall of 1952 a series of three applications 10 days apart were made on a lawn area containing approxi-

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TURF WEED EXHIBIT

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Those who attended the last turf conference will remember that a living exhibit of the common turf weeds attracted considerable attention. A similar exhibit was assembled by Dr. Jesse Skoss and displayed in the Educational Section of the California International Flower Show held at Hollywood Park, Inglewood, March 14 to 22. Living plants of the chief turf weeds were displayed in attractive containers together with a card listing the common and scientific names, and recommendations for the most practicable method of control.

One organization had planned to make an educational exhibit of the various turf grasses, but circumstances prevented the execution of this plan. This was most unfortunate, for we believe that such a presentation of the modern ideas in turf maintenance would attract an unusual amount of attention. Such an exhibit could not be sponsored by the University, since it would result in an avalanche of telephone calls and letters on turf subjects which could not be handled.

It has been necessary to increase the printing of Southern California Turf Culture to 4500 copies. This publication is distributed almost entirely through the various organizations represented on the Advisory Committee. This publication is becoming known throughout the whole world of turf culture. From the beginning, our aim has been to supply useful information, preferably original, in each issue rather than mere chit-chat. Your suggestions for improving this publication will be appreciated.

TURF AREA SURVEY OF LOS ANGELES COUNTY

Information on the area of turf in the various categories of usage is not available for California but is urgently needed. The Advisory Committee has succeeded in initiating a turf area survey of Los Angeles County which will indicate the amount of turf which is currently in use. If this project is successful, it is hoped that something similar can be done for the other counties of the state. However, information of this type for the several counties of the state having large metropolitan areas would be very useful. It is hoped that the results of the survey can be announced later in the present year.

In a recent book, "Marching With the Grasses" by Raymond Pool, he stated that the total acreage of turf in the county is enormous and estimated that there were over twenty million home lawns in the county Los Angeles is a horizontal, spacious city, and it is our belief that the amount of home lawn turf will equal and possibly exceed the national average.

**THE USE OF 2,4, 5-T
FOR CLOVER CONTROL IN TURF**

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mately 25% clover in the turf. Clover control of applications made at all three times, as shown in Table 2, were satisfactory for the higher rates, while no rates of less than one-half pound of 2,4,5-T acid equivalent per acre gave complete control.

TABLE 2

PERCENT OF CLOVER IN LAWN TURF AT PURDUE UNIVERSITY
AVERAGE OF 3 DATES OF APPLICATION
AUGUST 29, SEPTEMBER 10 AND SEPTEMBER 19

Treatment, lbs. Acid Equivalent	Time After Spraying	
	1 Month	2 Months
None	28	23
..... 1, 2,4-D	4r	fr
1# 2,4,5-T	0.3	0.3
1# 2,4,5-T & 1/2# 2,4-D	0.3	0.1
1/2# 2,4,5-T	2	1.5r
1/2# 2,4,5-T & 1/4# 2,4-D	2	2r
- New Leaves on old stolons		

Observations on golf courses where these materials have been used lead to one precaution. If applied on dense matted areas of creeping bent which have dry soil below, these can be injured by 2,4,5-T.

Based on these observations, the current recommendation for clover control in fairways and lawns is a fall application of one pound of the amine form of 2,4,5-T acid equivalent. In most formulations this is equal to one quart of 2,4,5-T solution. If broadleaf weeds need to be controlled, then add one-half pound of 2,4-D acid equivalent, one pint solution, to the 2,4,5-T solution. Late fall applications, (October in the Midwest) have given the cleanest turf areas as treatments made at that time will also kill the fall growth of new weeds, including some *Poa annua* and chickweed. Clover control is only one step in turf improvement. Adequate nitrogen fertilization and soil cultivation should be included in the program.

EDITORIAL NOTE: Apparently only an ester form of 2,4,5-T is currently licensed for sale in California. Care should be exercised to avoid drift to susceptible plants until experience indicates the necessary precautions.

TURFCONFERENCEINFALL

Tentative dates of October 12 and 13 have been selected for the annual Southern California Conference on Turf Culture. Plans are being made to bring several nationally prominent authorities on turf culture for this event. Full details will be given in the next issue of this publication.

RECENT GIFTS

Vaughan's Seed Company
Chicago, Illinois
1 lb. Grass seed mixture

Wilbur-Ellis Company
Los Angeles, California
Transportation costs on
fertilizer

Pacific Toro Company
Los Angeles, California
Servicing of equipment

FIRST DOCTORATE IN TURF CULTURE

Another milestone has been passed in the development of investigational work in turf culture on the Los Angeles Campus, with the production of the first doctoral dissertation in this field. This was produced by Dr. M. Zaki Mahdi and is entitled "The Influence of Management on Botanical Composition and Quality of Turf." This included a number of very important discoveries which will be reported to our readers later.

Dr. Mahdi was a graduate of Fouad I University in Giza and afterward was a teaching assistant there. Later he spent six years in the Park Department of Cairo, Egypt. He was awarded a scholarship in 1946 and came to U.C. L.A., where he obtained his MS. in 1948. He returned to Egypt as an instructor at his University, but left the following year to come back and complete his work. He will return to the staff of the Agricultural College of the University.



DR. M. ZAKI MAHDI

EVALUATION OF BENTGRASS STRAINS FOR BOWLING AND PUTTING GREEN TURF

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CREEPING BENTS - Vegetatively propagated strains

1. Arlington bent (C 1). This is a slow growing, but very persistent bent. It is very resistant to dollar spot. In mixtures with other bents, it may tend to disappear if watered excessively. It needs close mowing to prevent characteristic swirl. The color is somewhat bluish green.
2. Dahlgren bent. This is a recent introduction of the U. S. Golf Association Green Section. It is very aggressive and vigorous and requires abundant nitrogen feeding. It is somewhat coarse in texture if used alone, but mixes well with Congressional bent and possibly others. It is very resistant to turf diseases.
3. Congressional bent. This is one of the outstanding bentgrass clones with fine color, texture and moderate resistance to dollar spot.

This bent mixes well with either the Arlington or Dahlgren strains to form a turf of high quality. It is without doubt one of the best all around strains for this area.

4. Old Orchard bent. This bent is very aggressive and may need a little extra brushing and combing to prevent matting. It is outstanding in texture, color, and vigor, and is moderately resistant to dollar spot. This is undoubtedly one of the best creeping bent strains for California.
5. Collins bent. A very beautiful bent of somewhat light color, but this grass is not reliable at all seasons of the year. We do not believe that it adds anything to mixtures as has been suggested in the East.
6. Cohansev bent. This has an attractive light green color and excellent texture, but is very susceptible to dollar spot. It will make a beautiful turf with fungicidal protection. This grass is said to stand hot weather well in the southeastern United States. This grass has been tried in some of the hotter areas of California - without impressive results thus far. We doubt if it has great value. The very light green color is disliked by some.
7. Los Angeles Country Club Selection. This bent has an attractive light green color and is the finest textured creeping bent in our collection. It will need a little fungicidal protection, but is decidedly worth trial. It will tend to crowd out other associated bent strains in time, although it is only moderate in growth rate. This grass needs high nitrogen and good care. This strain approaches the Velvet bents very closely in texture,

and is a very unique and distinctive creeping bent which should be preserved for possible use in breeding.

8. Toronto bent. The stock of this grass was obtained from the U. S. Golf Association, and since it has performed poorly, a new stock has been obtained from other sources to check trueness of strain. The winter color has been poor, and dollar spot has been a severe problem with this strain.
9. Penn State Polycross. This production of Prof. H. B. Musser has been available in limited quantities as seed. The winter color is excellent, and the texture is fine and uniform. Unfortunately, resistance to dollar spot is not quite comparable to that of the best available vegetatively propagated strains. It is, nevertheless, the best available creeping bent which can be grown from seeds.
10. Seaside bent. This grass is grown everywhere and owes its popularity to easy availability from seed. With proper feeding of nitrogen and with some chemical fungicidal protection, this grass will form an excellent putting green surface. The chief faults of Seaside are somewhat poor winter color and some susceptibility to dollar spot. There is some genetic variability, and some undesirable types of creeping bent can often be found in Seaside bent greens.

VELVET BENTS

The velvet bents are well adapted to the coastal area of southern California. They have a beautiful, fine texture. However, they are so slow to repair injuries that we do not believe that they should be recommended for use on putting or bowling greens. The Piper and Raritan Velvet bent plots were both established from seed. There does not seem to be much difference between the two.

COLONIAL BENTS

Except for the absence of stolons, these grasses resemble the creeping bents in vegetative characteristics. The Astoria bent is a type which is produced in the Pacific northwest. Highland is a more drought resistant type, which has naturalized on the higher elevations. The latter seems to be a grass of great potentialities which has not had sufficient attention.

This publication "Southern California Turf Culture" is sponsored and financed by the Research Advisory Committee. Communications should be sent to the Secretary, or to Dr. V. T. Stoutemyer, Department of Floriculture and Ornamental Horticulture, University of California, 405 Hilgard Avenue, Los Angeles 24, California.