

MICHIGAN

TURF GRASS

REPORT

SUMMER 1970

Michigan Agricultural Experiment Station

Michigan State University

East Lansing

(NOT FOR PUBLICATION)

WINTER TURFGRASS CONFERENCE

The 40th Annual Michigan Turfgrass Conference was held January 27-28, 1970 in the Kellogg Center. This is the second oldest state conference in the nation. There were 512 registered for the conference, the largest number ever to attend. Special topics included golf course irrigation, turfgrass cultivation, putting green establishment and maintenance, sod heating, drainage for sod fields, spraying equipment, turfgrass diseases, pesticide safety and compatibility and helicopter application of pesticides. The out-of-state speakers were Dr. Paul Alexander, formerly USGA Greens Section Agronomist and now Educational Director for the Golf Course Superintendent's Association of America; Jim Latham, Chief Field Agronomist for the Milwaukee Sewerage Commission; Dr. Robert Miller, Turfgrass Specialist, Ohio State University; and Dr. Mel Shurtleff, Turfgrass Pathologist, University of Illinois. Luncheon speakers were Dr. James Beard, Dr. Paul Rieke, and Mr. Al Dorow, M.S.U. Backfield Coach.

The conference was preceded by a half-day training school which was deemed quite successful by those who participated. The training program consisted of options in turfgrass diseases, turfgrass identification and uses; and soils and fertilizers. A similar program is planned for 1971, which would be held on Monday, January 25 followed by the regular conference on January 26 and 27.

1969 EAST LANSING TURFGRASS FIELD DAY

The 1969 East Lansing Turfgrass Field Day was held on September 4. There were 300 professional turfgrass managers present that participated in the biennial event. In addition to the turfgrass research plots at M.S.U., the newly installed synthetic turf at Spartan Stadium was viewed. Copies of the field day report may be obtained from Bob Shearman, Department of Crop and Soil Sciences, Michigan State University.

SOD PRODUCERS' FIELD DAY

Sod producers and those of allied fields gathered for the first M.S.U. Sod Field Day held September 10, 1969. They viewed the first concentrated university research effort in sod establishment and production ever initiated in the U.S. A Sod Field Day Report, containing information concerning the research viewed, may be obtained by writing Bob Shearman, Department of Crop and Soil Sciences, M.S.U.

AMERICAN SOCIETY OF AGRONOMY HELD IN DETROIT

The annual American Society of Agronomy meetings were held in Detroit on November 10-13, 1969. Turfgrass researchers and educators from throughout North America participated in a field trip to the East Lansing turfgrass research plots on Wednesday, November 12. In addition to the field plot visit, they viewed the M.S.U. Muck Farm sod production research plots, Halmich's Sod Nursery at East Lansing and the Oakland Hills Country Club. The M.S.U. turfgrass research group was pleased to review the turfgrass facilities with colleagues from other states.

MICHIGAN TURFGRASS MERITORIOUS SERVICE AWARD

This year's recipient of the Meritorious Service Award presented by the Michigan Turfgrass Foundation was Dr. Kenyon T. Payne. He was the fourth person to receive the award since its initiation. Dr. Payne's name will join the list of Dr. James Tyson, Charles Chapman and Clarence Wolfrom as those who have made outstanding contributions in our field. In addition to this honor, Dr. Payne served as a Senior Consultant in Agronomy to the Ministry of Agriculture in Brazil from September 2 to December 1, 1969, where he worked in designing a research program and facilities for a newly formed Federal Institute in two southern states of Brazil.

GCSAA SCHOLARSHIPS AND OUTSTANDING SENIOR AWARD

Recipients of this year's GCSAA Scholarships were Mark Fields, Anthony Tredente, and Duane Zienert. Mark Fields came to M.S.U. from Ft. Wayne, Indiana; graduated with a 3.86 G.P.A., and is working for the summer at Inverness Country Club in Toledo. Mark plans to enter the four year turfgrass management program at M.S.U. this Fall. Anthony Tredente had a 3.18 grade point average. He is from Bowling Green, Ohio and is presently employed at Blythefield Country Club in Grand Rapids. Duane Zienert from Washington, Michigan earned a 3.62 G.P.A. upon completion of the two year program; he is working at Maple Lane Golf Course. Duane has a brother who will join the technical program this Fall. It may well be that Duane has set a family precedent.

Mike Donahue was the recipient of the Outstanding Senior Award which is awarded for leadership and scholastic ability. Mike had a 3.33 G.P.A. He is a graduate of the Massachusetts Short Course program, and is presently employed by the Toronto Parks System.

ACTIVITIES OF M.S.U. TURFGRASS RESEARCHERS AND EDUCATORS

This past year has seen the M.S.U. researchers and educators involved in many activities. Dr. Beard and Dr. Rieke participated in the First International Turfgrass Research Conference held in Harrogate, England. Over 75 turfgrass researchers from 13 countries were in attendance. Both Dr. Beard and Dr. Rieke presented research papers for the conference. In addition, Dr. Beard served as chairman of the organizing committee and played an important role in the success of the conference. Dr. Beard was elected to the seven member Executive Committee of the newly formed International Turfgrass Society.

Dr. Beard received two other honors this past winter. He was elected to the Board of Directors of the American Society of Agronomy; he received a National Science Foundation Post-Doctoral Fellowship. There were only 120 fellowships issued throughout the U.S. in 1970. Dr. Beard is studying at Riverside, California in the Life Science Department at the University of California. He is conducting enzymatic studies in high temperature growth stoppage of creeping bentgrass, and should have some interesting results to report when he returns.

In January, 1970, a new researcher joined the M.S.U. turfgrass group; he is Dr. Chuck Laughlin, a Nematologist and Assistant Professor in the Department of Entomology. Dr. Laughlin brings excellent training and experience to strengthen our turfgrass program. He received his B.S. degree from Iowa State University and his M.S. in Turfgrass Management from the University of Maryland where he was an instructor for two years in the technical turfgrass management program. Dr. Laughlin received his Ph.D. from Virginia Polytechnical Institute working with Dr. Houston Couch, an eminent turfgrass pathologist. In addition, he has been a golf course superintendent at Ames Country Club in Iowa, a superintendent for a golf course construction company on the East Coast and an Extension Nematologist at the University of Florida.

Dr. Laughlin has already begun investigation into the effects of nematodes on Toronto Creeping Bentgrass and nematode associations with poor stands of Merion Kentucky bluegrass. We welcome Chuck to the M.S.U. turfgrass research group, and will look forward to including the results of his research in future reports.

In March, 1970, Robert Shearman assumed the turfgrass extension responsibilities within the M.S.U. turfgrass research group. Bob is a native of Oregon, received his B.S. degree at Oregon State University and came to Michigan State in January, 1969. He was employed at Columbia Edgewater Country Club in Portland, Oregon before coming to M.S.U. His Master's thesis study involves cultural and environmental factors affecting the water use rate and irrigation requirements of Penncross creeping bentgrass. Many of you met Bob at the winter conference.

GRADUATE STUDENT ACTIVITIES

Our graduate students have been turning in some outstanding research. John King completed his Ph.D. requirements in June, 1970. John made a comprehensive study of factors affecting the heating and damage of Merion Kentucky bluegrass sod under simulated shipping conditions. Dr. King has accepted a position as Assistant Professor of Agronomy at the University of Arkansas, Fayetteville, where he will be involved in teaching and developing a turfgrass research program. An abstract of John's thesis is included in the appendage of this report.

John Kaufmann completed his M.S. degree in March, 1970. John plans to continue studying at M.S.U. for his Ph.D. The research involved in John's program concerned the influence of temperature and other environmental factors on the activity of the enzyme-nitrate reductase. John made his studies on both creeping bentgrass and bermudagrass.

June was also the month that Dave Martin completed his M.S. degree. Dave's research program dealt with the composition of turfgrass thatch and the influence of several materials to increase thatch decomposition. A summary of his work with thatch problems will be upcoming in a future turfgrass research report. Dave will continue his studies for a Ph.D. degree as the recipient of the O.J. Noer fellowship.

IMPORTANT DATES

Here are several important dates for you to remember, and now is the time to get them on your calendar.

1. The Northern Michigan Turfgrass Field Day will be held on Wednesday, September 9, 1970, at Traverse City Country Club. This is a biennial event that promises to cover many areas of interest.

REPORT ON HELMINTHOSPORIUM

Dr. Joseph Vargas

In Michigan this May we had a severe outbreak of a disease called Helminthosporium leaf spot, or melting out. The disease is caused by a fungus called Helminthosporium. The environmental conditions that promoted this severe outbreak were the cool temperature and rainy weather which prevailed during the latter part of May. These conditions allowed repeated sporulation, germination and infection by the fungus on susceptible bluegrass varieties. This resulted in severe thinning and dying of the grass plants.

The "common type" Kentucky bluegrass varieties such as Kenblue, Park, Delta, Newport, etc. were the most susceptible to this disease and consequently were the most severely damaged. On the other hand, the Kentucky bluegrass varieties Merion and Fylking which are highly resistant to the disease came through this disease epidemic in good shape. This fact should be kept in mind when selecting bluegrass varieties for future plantings.

Where the disease has been severe, one of the following fungicides should be applied to help prevent new infection from occurring. (Daconil 2787, Fore, Manzate, or Actidone-Thiram). The diseased grass should also be well fertilized with nitrogen to help speed up the recovery.

In future years, to help prevent the disease from occurring it would be advisable to spray susceptible varieties with one of the above mentioned fungicides at the recommended rate. The first application should be applied around the first of May with two subsequent applications made ten days apart.

ABSTRACT

FACTORS AFFECTING THE HEATING AND DAMAGE OF MERION
KENTUCKY BLUEGRASS (Poa pratensis L.) SOD
UNDER SIMULATED SHIPPING CONDITIONS

By

John William King

Merion Kentucky bluegrass sod may heat and be damaged during shipment from commercial production fields to market.

The effects of cutting height, nitrogen rates, and N⁶benzyladenine treatments on sod heating and damage were investigated under simulated shipping conditions in a series of experiments. Shipping conditions were simulated by stacking 12 sod pieces in insulated plywood boxes (20 inches square by 30 inches deep) and placing 255 lb. of weight over the sod. Temperature, carbon dioxide, oxygen, and ethylene levels within the sod stacks were measured. Sod pieces were removed from the boxes at 24 hour intervals. Six inch diameter plugs were transplanted to pots in the greenhouse. Percent leaf kill, percent leaf cover, and root organic matter production data were obtained.

The effects of carbon dioxide, oxygen, and ethylene were investigated in controlled atmosphere studies. Sod pieces were removed from the chambers at 24 hour intervals and transplanted to pots in the greenhouse. Percent leaf kill, percent leaf cover, and root production data were obtained.

Inhibition of respiration from oxygen starvation or from high carbon dioxide levels was not a cause of sod injury. Carbon dioxide levels increased to 13 to 19% and oxygen levels decreased to 2 to 5% during storage under simulated shipping conditions. Controlled atmosphere studies showed that sod survived longest when stored at 18% carbon dioxide and 2% oxygen. The respiration rate of sod cut at 2 inches averaged 74 ml CO₂/kg/hr.

The decreases in total available carbohydrate levels were well correlated with increases in percent leaf kill and decreases in root production for a sod heating box experiment conducted late in the season. Carbohydrate levels were not reduced to a consistent low level before sod death occurred for sod stored in controlled atmospheres at 104 and 83°F. Available carbohydrates were not exhausted in either experiment. Direct high temperature injury occurred at 104°F.

Ethylene production is not a factor affecting sod injury in commercial sod loads. High ethylene production (2 to 5 ppm) occurred where high rates of nitrogen were applied. The ethylene production was usually less than 2 ppm where normal levels of nitrogen (150 lb/A/yr) were applied. Controlled atmosphere studies showed that a sharp decrease in root production occurred between 2 and 4 ppm of ethylene. Ethylene production was independent of temperature.

N⁶benzyladenine, a respiration inhibitor, did not affect carbon dioxide and oxygen levels, temperature, or injury of sod during storage.

Root production was higher for sod produced with below normal nitrogen fertilization. The application of a very high rate of nitrogen (215 lb/A) within a few days before harvest resulted in more injury and less root production than for sod produced with normal (150 lb/A/yr) nitrogen fertilization.

Sod cut at 0.75 inch within a few days before harvest survived storage longer than sod cut at 2 inches. The low cutting treatment reduced respiration rate and temperature levels during storage and resulted in reduced percent leaf kill and increased root production.

Sod injury increased progressively in relation to increased temperature levels occurring during storage. Sod survived 5 days with less than 10% leaf kill where storage temperature reached only 87°F. The percent leaf kill reached 80 to 90% after 3 to 4 days of storage where storage temperatures reached 95°F. The rate of sod injury was greater relative to temperature in early June when maximum seedhead production occurred and in early August when soil temperatures were higher. Ventilation tubes inserted into commercial sod loads did not reduce temperature effectively. High temperature was the most important cause of sod injury.