
APRIL 1987

**LAWN
INSTITUTE**



Harvests

Volume 34 Number 1

THE HARVEST MIX

This issue of Harvests reviews 16 papers from the Fifth International Turfgrass Research Conference. The January issue was devoted to the other 78 papers. Together these reviews survey the recent research worldwide.

The University of Guelph, Guelph Ontario Canada offers a home study course in Turfgrass Management and related options which is a unique approach to a diploma in this field.

Four papers presented at the Texas Turfgrass Association and the Louisiana & Southern Turfgrass Association Conferences are reviewed.

An announcement of a new seeded bermudagrass, NuMex S-1, from the work of Dr Arden Baltensperger, New Mexico, is exciting for southern turfgrass enthusiasts.

An article that indicates healthy lawns reduce pollutants in water runoff is a positive statement.



THRESHING THE JOURNALS

(Published research results)



The Fifth International Turfgrass Research Conference

The January 1987 issue of Harvests was devoted in its entirety to the review of 78 research papers presented at the International Turfgrass Conference in Avignon, France in 1985. The remaining 16 papers are reviewed in this issue.

At the conference, papers were presented as follows:

- Keynote Addresses	- 6
- Breeding and Evaluation	- 17
- Establishment and Management	- 10
- Soil, Irrigation and Nutrition	- 22
- Plant Protection	- 12
- Herbicides and Growth Regulators	- 10
- Physiology	- 7
- Poster Presentations	- 10

Total 94

They are presented in the 870 page Proceedings in these categories.

Sixteen countries were represented in the release of research reports. Since there were jointly sponsored projects, the total amounts to more than 94 papers.

Countries	Papers
United States	62
France	11
England	6
Northern Ireland	2
Wales	2
Ireland	2
Canada	2
The Netherlands	2
Italy	2
South Africa	2
United Kingdom	1
Poland	1
Great Brittan	1
West Germany	1
Federal Republic of Germany	1
Tunisia	1

Total 99

Twenty four states in the United States were involved in the presentation of 62 papers. Nine states contributed 3 or more papers each. Texas was the leader with 8.

United States

8 - Texas	2 - Massachusetts
6 - New York	1 - Mississippi
6 - Virginia	1 - Colorado
5 - New Jersey	1 - Oregon
4 - California	1 - Arizona
4 - Florida	1 - New Mexico
4 - Maryland	1 - Illinois
3 - North Carolina	1 - Missouri
3 - Rhode Island	1 - Iowa
2 - Georgia	1 - Indiana
2 - Pennsylvania	1 - Ohio
2 - Michigan	1 - Minnesota

Total 62

Note: The Conference Proceedings are available from:

Dr R D Schmidt
Professor of Agronomy
235 Smyth Hall
Virginia Tech
Blacksburg VA 24061
(703/961-6305)



Herbicides and Growth Regulators

TOLERANCE OF CENTIPEDEGRASS, BAHIAGRASS AND TALL FESCUE TO HERBICIDES

M Lewis and J M DiPaola
North Carolina, United States
pages 717 - 726



The authors noted that:

- Tolerance of centipedegrass, bahiagrass and tall fescue to herbicides has been evaluated to determine if bahiagrass and tall fescue could be suppressed or controlled in roadside stands of centipedegrass.
- Centipedegrass was tolerant to from one to three applications of sethoxydim.
- Centipedegrass was also tolerant to from one to three applications of sulfometuron-methyl.
- Bahiagrass and tall fescue were effectively controlled with one to three applications of sulfometuron-methyl or to three applications of sethoxydim.
- Rates of herbicide application are of critical importance in obtaining satisfactory results.



GRASS WEED CONTROL IN LAWNS OF AMINOTRIAZOLE TOLERANT CULTIVARS OF FINE FESCUE AND COLONIAL BENTGRASS

D T Johnston and R Fisher
Belfast, Northern Ireland
pages 727 - 734



The results of this study are summarized as follows.

- The selective control of weed grasses in aminotriazole tolerant cultivars of Duchess Colonial bentgrass and Countess fine fescue has been demonstrated.

- Annual bluegrass, Yorkshire fog [Velvetgrass], cocksfoot [orchard-grass] and perennial ryegrass were totally killed with aminotriazole while Duchess suffered only a 50 percent reduction in ground cover.
- Control cultivars, Bardot Colonial bentgrass and Highlight fine fescue were severely reduced by aminotriazole while weed grasses were completely killed.
- Thus, use of aminotriazole tolerant cultivars, Duchess and Countess, make possible the selective control of weed grasses in fine turf.



TURFGRASS GROWTH AND SEEDHEAD SUPPRESSION BY MEANS OF A NEW PLANT GROWTH RETARDANT

P C Bhowmik
Massachusetts, United States
pages 735 - 744

The author reported:

- Monsanto Chemical Company Mon 4621 [flowable] and Mon 4622 [granular] have been evaluated to determine their effects on seedhead suppression and growth retardation of Kentucky bluegrass-red fescue turf.
- Both formulations when applied on May 3 [100 percent green-up but no mowing] or on May 12 [100 percent green-up plus 2 mowings] provided better seedhead suppression than the May 21 application [100 percent green-up plus 18 day growth].
- Phytotoxicity to the turf was minimal from these treatments. Turf quality was good to excellent.
- From 50 to 80 percent reductions in growth were observed during the initial 42 day period regardless of the time of chemical application.
- Sequential applications of Mon 4621 followed in 35 days by Mon 4622 reduced top growth up to 70 days.

EFFECTS OF EPTC ON SEED FORMATION IN TALL FESCUE

W E Chappell
Virginia, United States
pages 745 - 747

It was concluded that:

- Tall fescues grown in most of the eastern United States require seedhead removal by mowing or other means in order to produce a suitable turf.
- EPTC [S-ethyl dipropyl thiocarbamate] dates of application for good seedhead control generally run from March 1 to April 15 in the mid-Atlantic region.
- A method for more accurately pinpointing the proper application date by measuring the length of the developing seed producing structure in the sheath is proposed.
- EPTC will control development of the seed structure if applied when growth is from 0 to 6 inches [0 to 15 centimeters] in length.
- Leaf length is not affected by this treatment. Temperature and rainfall have no appreciable effect on the action of EPTC in controlling seed formation.
- Liquid formulations of this chemical have proven ineffective.



TURFGRASS QUALITY AND PHYTOTOXICITY AFFECTED BY GROWTH RETARDANTS

R W Duell
New Jersey, United States
pages 749 - 756

The following summary is presented.

- Preliminary field trials have indicated that mowing a week or two after proper application of plant growth regulators may increase turf injury.
- Fine fescues were thinned when mowed 10 days following an application of amidochlor.
- Manhattan ryegrass and Fylking bluegrass treated May 11 with mefluidide were mowed at 1 1/2 and 2 1/2 inches [38 and 63 millimeters] 5, 10, 15, 20, 25 and 30 days after treatment.
- Mowing at a normal 1 1/2 inches 5 to 20 days after treatment exposed an abundance of yellowing basal foliage.
- Higher/later mowing revealed less yellowing foliage.
- Suggested accelerated senescence did not develop on similar treated spaced nursery plants of tall fescue.





ROADSIDE VEGETATION MANAGEMENT

R P Freeborg, J D Morre and W H Daniel
Indiana, United States
pages 757 - 766

An abstract of research results demonstrate that:

- Plant growth regulators, mefluidide, flurprimidol, paclobutrazol, EPTC, chlorsulfuron and metsulfuron have been evaluated on tall fescue roadside vegetation.
- Applications made during October have caused unacceptable delayed green-up in spring.

- April and May applications of flurprimidol and paclobutrazol effectively reduced foliage and seedhead height but did not prevent seedhead development.

- Mefluidide and EPTC also reduced foliage and seedhead height and, in addition, prevented seedhead development and reduced foliage height at lower rates than when applied alone.

PHYSIOLOGY

PHYSIOLOGY: TURFGRASS PHYSIOLOGY RESEARCH: 1981 - 85

J B Beard
Texas, United States
pages 81 - 104.

The author noted:

- During the years 1981 - 1985 significant results of turfgrass physiology research have been presented in accordance with the following outline:

- Turfgrass Physiology, Growth and Development
 - Cell Biology
 - Root Growth and Physiology
 - Spring Root Decline
 - Species and Cultivar Variation
 - Cultural Influences
 - Shoot Growth and Physiology
 - Tillering
 - Cultural Influences
 - Seedling Growth
 - Radical Growth
 - Temperature Effects
 - Carbohydrate Physiology
 - Flower Development

- Turfgrass Stress Physiology

- Low Temperature Kill
 - Species and Cultivar Hardiness
 - Cultural Influences
- Chilling Injury
 - Symptom Development
 - Physiological Responses
- Heat Stress
 - Hardiness Assessment Techniques
 - Species and Cultivar Hardiness
 - Heat Injury Mechanism
- Evapotranspiration ET
 - Modeling Resistances to ET
 - Species and Cultivar ET Rates
 - Cultural Influences
- Drought
- Shade Stress and Adaptation
- Atmospheric Pollutants
- Traffic Stress
- Salt Tolerance
- Sod Heating.



A RAPID SCREENING TECHNIQUE FOR GENETIC VARIABILITY IN TURFGRASS ROOT SYSTEMS

V G Lehman and M C Engelke
Texas, United States
pages 769 - 776



The following summary is presented.

- Under present management systems, turfgrass root systems are concentrated in the upper 4 inches [10 centimeters] of the soil profile.
- Expansion of root systems into lower soil profiles would effectively supply more moisture to the plant resulting in drought avoidance.
- St Augustinegrass, buffalograss, and zoysiagrass have been found to have genetic variability in root morphology.
- The number of roots and the total root mass of St Augustinegrass were greater than either buffalograss or zoysiagrass.
- Differences in root number and mass occurred between accessions within both St Augustinegrass and zoysiagrass.
- No differences were found among the buffalograss plants with regard to root length.



SPRING ROOT DECLINE: DISCOVERY, DESCRIPTION AND CAUSES

S I Sifers, J B Beard and J M DiPaola
Texas and North Carolina, United States
pages 777 - 788



The results of this study are summarized as follows:

- Spring root decline occurs on eight major warm season turfgrass species.
- Spring root decline was noted in Texas in 4 of 8 years when soil temperatures at a 4 inch depth [10 centimeters] rose to 63 degrees Fahrenheit [17 degrees Centigrade].

- At times when spring root decline was not observed, shoot growth during the initial one to two spring months was extremely slow because of cool soil temperatures.
- In controlled experiments, spring root decline only occurs at the higher temperatures. This indicates that the rate of temperature rise subsequent to spring green-up is an important factor in determining whether the root decline will occur.

Blades of Grass

I was standing
here minding
my own business
when "whoosh"-
I had a new
hair cut!



INFLUENCE OF THE MOWING FREQUENCY ON THE RESPONSE OF TWO TURFGRASS SPECIES

F Lemaire, J L Papin, M C Pinson and
J Coulaud
Angers, France
pages 789 - 800

An abstract of research results demonstrate that:

- Frequent clipping practiced on turf results in decreasing dry matter yield of the aerial parts and root systems. It also modifies root distribution in the soil.
- Nitrogen and phosphorus nutrition also have an effect on the shoot/root ratio.
- With Pennfine perennial ryegrass and Ludion tall fescue a depressing effect of phosphorus on the root systems was noted when clipping frequencies were high.
- This phosphorus response was noted in solution culture with immature turf [three months old].

CLIMATIC ADAPTABILITY OF THREE COOL SEASON GRASSES IN NORTHEASTERN UNITED STATES BASED ON GROWING DEGREE-DAYS

T K Danneberger and A J Turgeon
Ohio and Michigan, United States
pages 801 - 806



The authors noted that:

- Calculations of growing degree days and temperature stress degree days have been used to evaluate the adaptability of Kentucky bluegrass, creeping bentgrass and annual bluegrass.

Thirty year averages of minimum and maximum daily temperatures from 72 locations throughout the northeastern and northcentral United States were used.

- Based on temperature stress degree days, creeping bentgrass and Kentucky bluegrass had the least number of stress zones.
- Annual bluegrass had the greatest number of temperature stress zones with the greatest number being in the southern part of the region. Under temperature ranges for the southern part of the northeastern United States, 40 percent of the growing season was stressful to annual bluegrass.



Spring

SOD STRENGTH AND TURFGRASS QUALITY OF KENTUCKY BLUEGRASS CULTIVARS, BLENDS AND MIXTURES

J R Hall III, L H Taylor and J F Shoulders
Virginia, United States
pages 807 - 820



An abstract of research results demonstrate that:

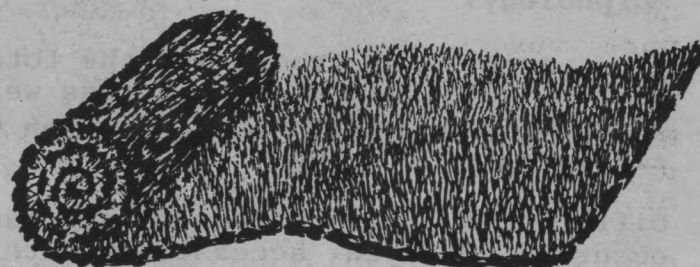
- Spring harvested sod has twice the strength of mid-summer harvested sod.
- Of the Kentucky bluegrasses Birka, Cheri, Enmundi, Holiday, Merit, Mosa, Mystic, Sydsport, Vanessa, Vantage and Victa had greatest sod strength.

- Individual cultivar performance did not always serve as a reliable indicator of that cultivars ability to affect desirable blend performance.

- Good turfgrass quality ratings did not insure good sod strength.

- Sod strength was best with those grasses that rated highest for percent ground cover and turfgrass quality seven to nine months after seeding.

- Younger sod [14 months] generally had less sod strength than older sod [21 months].



A COMPARATIVE STUDY OF TURFGRASS PHYSIOLOGICAL RESPONSES TO SALINITY

C H Peacock and A E Dudeck
Florida, United States
pages 821 - 830



It was concluded that:

- Seashore paspalums maintain less of a differential between leaf osmotic potential and solution osmotic potential than do bermudagrasses. This means that less energy is utilized for osmotic adjustment.
- The more salt tolerant grasses are those that maintain a smaller difference in osmotic potentials, using some mechanism other than osmotic adjustment to negate effects of salt stress while conserving energy for growth.
- In screening for salinity tolerance in turfgrasses, osmoregulation alone cannot be used as an indicator of salinity tolerance since growth under saline conditions may be severely inhibited.

THRESHING THE JOURNALS CONTINUED



INFLUENCE OF DROUGHT STRESS AND FALL NITROGEN FERTILIZATION ON COLD DEACCLIMATION AND TISSUE COMPONENTS OF PERENNIAL RYEGRASS TURF

M S Welterlen and T L Watschke
Pennsylvania, United States
pages 831 - 840



Recommendations may be based on the following.

- Cold acclimation of cool season grasses begins in the fall and reaches a maximum in January.
- Deacclimation occurs in the spring.
- Turfgrass management, microclimate and genetic background influence the level of acclimation attained and the rate at which acclimation and deacclimation occur.
- Grasses that lose their winter hardiness early in the spring are more susceptible to injury from prevailing freezing conditions.
- With Pennfine perennial ryegrass, drought stress lowered water content of both crown and leaf tissue.
- Cold hardiness of Pennfine perennial ryegrass was higher in drought stressed plants than in those which were irrigated.
- Fall-applied nitrogen decreased cold hardiness in Pennfine perennial ryegrass sampled in early April.



EFFECT OF PROLONGED USE OF UREAFORM FERTILIZER ON TURFGRASS IN COMPARISON WITH OTHER NITROGEN FERTILIZERS

R K A H Helmig, H D van Nieukerken and I R L Veegens
Dusseldorf, Federal Republic of Germany
pages 855 - 856



The following summary is presented.

- A poly methylene urea, synthetic organic nitrogen ureaform fertilizer, has been researched for turf. It contains 38.6 percent nitrogen and has an average activity index of 60. This nitrogen becomes totally available to plants because of a

breakdown by soil microorganisms - Azotobacter, Nitrosomonas, Nitrobacter. Ninety three percent of the nitrogen is mineralized within 34 weeks at soil temperatures of 64 to 68 degrees Fahrenheit [18 to 20 degrees Centigrade]. The remainder becomes available at a slower rate.

- Turf damage caused by Fusarium was less where ureaform was used than where ammonium sulfate was applied.
- Thatch development was less on turf fertilized with ureaform. Ureaform apparently has a positive influence on the development of bacteria known to decompose thatch.
- Turfgrass fertilized with ureaform had less than 1 part per million nitrate in the ground water compared to 78 parts per million nitrate from turf fertilized with calcium ammonium nitrate.



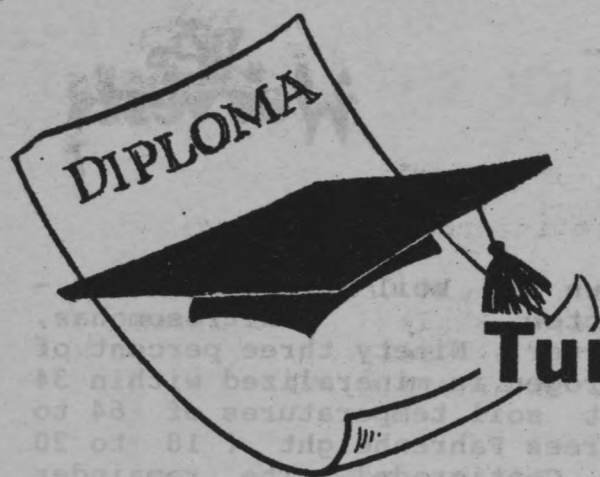
LONG TERM EXPERIENCE WITH ISODUR AND OTHER SLOW RELEASE NITROGEN FORMS IN INTENSIVE TURF MANAGEMENT

H Will and E U Belger
Limburgerhaf/Pfalz
pages 853 - 854

The results of this study are summarized as follows:

- IBDU [isobutylidene diurea] has provided the steadiest source of plant available nitrogen in comparisons with UF [ureaform-based fertilizers] and SCU [sulfur-coated urea].
- Sulfur coated urea did not provide as good color as IBDU.
- Ureaform produced measurably inferior color and growth compared with IBDU and sulfur coated urea.
- Where sulfur coated urea had been used for a five year period, the soil pH was lower. This acidifying effect produced more thatch which caused hydrophobic conditions in the upper soil layer. Unfavorable conditions for germination of turf seed was noted in this layer.





Home Study in



Turfgrass Management

The University of Guelph in Guelph, Ontario Canada offers a Home Study Course leading to a Diploma in Horticulture with options in five areas of special interest to grounds personnel.

- Cemetery Management
- Landscape Contracting
- Landscape Maintenance
- Park Management
- Turf Management

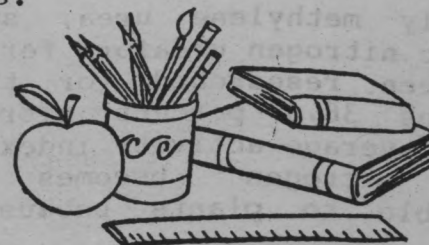


ABOUT THIS HOME STUDY PROGRAM:

- It is learning and teaching at a distance. Mailbox education, correspondence study, open access learning, distance education, self-learning, guided independent study and home study are just different names for the same thing.
- Motivated adults, especially personnel in agriculture, horticulture and allied industries have much to gain. Geographic remoteness, job or family commitments or physical disability makes it impossible for many adults to attend regular classes. Independent study is an alternative approach to career upgrading, professional certification or general interest needs. Independent study students are a diverse group: full- and part-time farmers, horticulturists, landscape contractors, gardeners, golf course superintendents, greenhouse operators, cemeterians, urban foresters, hobbyists, homemakers; adults from 19 to 80.
- A study package in your own home is the key to success. When your Enrollment Application has been processed, you receive a complete learning package by mail. Many courses are multimedia and include filmstrips or microfiche with hand viewer, lectures on audio tape cassettes as well as illustrated

manuals. Some subjects are available on videotape. Some courses have self-marked questions. All diploma courses have written assignments that you submit to the Independent Study Office. Assignments are graded and returned with comments, allowing you to evaluate your progress. You submit final exams to the office and receive course completion cards after assessment.

- Motivation and self-discipline are required for success. Depending on the individual and the course, a course can take 50 to 120 hours to complete. You need initiative to plan and carry out your study schedule. But you aren't completely alone - counseling is as close as a telephone call, letter or visit to the Independent Study office. Whether you are satisfying a special interest or pursuing an Ontario Diploma in Horticulture or Agriculture, it's important to have a goal in mind. Our counselors are here to advise you on course planning.
- The Ontario Diplomas in Agriculture and Horticulture [ODA, ODH] were designed to provide any adult, regardless of educational background, with the opportunity to learn the principles and practices of agricultural and horticultural science. The courses help you understand the reasoning behind methods and procedures that you apply in your vocation. The ODA and ODH programs are sponsored by the Ontario Ministry of Agriculture and Food and are offered through the University of Guelph School of Part-time Studies and Continuing Education. They are the only diploma level correspondence courses in agriculture and horticulture offered in Canada. With minor exceptions, course content applies to all areas of Canada and the United States. Since the first ODH was awarded in 1963 and the first ODA in 1980, almost 600 students have graduated. At present almost 5,000 individuals are enrolled in one or more courses.



HOME STUDY IN TURFGRASS MANAGEMENT-

continued



- A diploma can usually be completed in three years without interfering with your employment. You have five years to complete the program, but extensions may be granted in special cases. Students with less than grade 10 academic achievement may experience difficulty in completing the program within three years.

For more information, contact:

Professor Harold Crawford
Independent Study - South House
University of Guelph
Guelph, Ontario N1G 2W1
Canada

519/824-4120 Ext 3400



THESE COURSES ARE REQUIRED OR
SUGGESTED AS ELECTIVES FOR EACH
OF THE OPTIONS LISTED

COURSES

OPTIONS

Course Number

Cemetery Management
Landscape Contracting
Landscape Maintenance
Park Management
Turf Management

2	Soils for Horticultural Crops	r	r	r	r	r
4	Introductory Entomology and Pathology	e	e	r	e	s
5	Woody Plants and Their Uses	r	r	x	r	x
6	Plant Use in the Home Landscape	x	x	r	x	s
8	Elementary Plant Propagation	x	e	s	x	s
10	Nursery Management	x	s	x	e	e
11	Fundamentals of Garden Design	x	r	s	e	e
16	Introduction to Turf Mgt	r	s	r	r	r
17	Plant Nutrition	x	x	s	x	s
19	Landscape Design & Installation	e	r	s	x	e
21	Indoor Landscaping	x	e	r	e	x
22	Arboriculture	e	e	r	s	e
26	Irrigation	e	s	e	s	r
28	Landscape Planning of Large Areas	x	e	x	e	x
33	Machinery for Turf	r	s	s	e	r
37	Detailed Landscape Construction	x	r	e	x	x
42	Office Management for Parks	e	x	x	r	x
45	Public & Labor Relationships for Parks	x	x	x	r	x
51	Urban Tree Management	r	s	r	r	s
52	Tree Care Equipment: A Manual	s	r	s	e	e
55	Horticultural Machinery	e	e	e	x	e
60	Psychology of Grief	r	x	e	e	x
138	Weed Control in Turf	r	e	r	e	r
199	Qualified Plantsman	r	r	r	r	r

KEY:

- r - required
- s - suggested elective
- e - may elect for study
- x - may not elect for study



HOME STUDY IN TURFGRASS MANAGEMENT-

continued



BRIEF DESCRIPTIONS OF SELECTED COURSE OFFERINGS

- 16 Introduction to Turf Management Turfs were developed to enhance the environment. This study of turf considers species and cultivars of turf grasses; their establishment, maintenance, nutrition and soil requirements. Weed control, pests and diseases are also covered.

A multimedia package: 156 slides in filmstrip; 2 audio tapes.

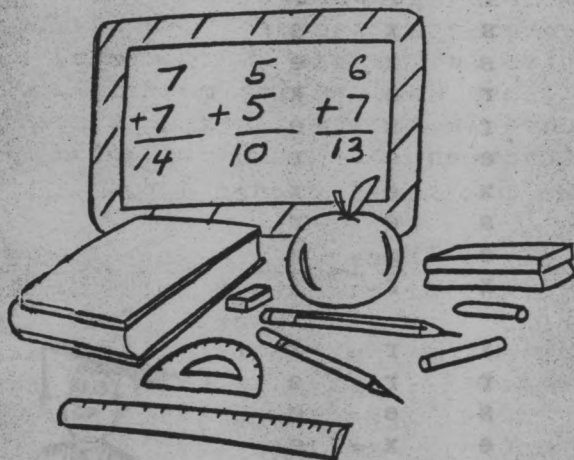
- 138 Weed Control in Turf A weed is a plant growing where it's not wanted. This course covers all aspects of turfgrass weed control from identification to cultural and chemical methods. The course is suited to the needs of greenskeepers, park gardeners and garden maintenance persons.

Text: Ontario Weeds, Alex and Switzer, Ontario Ministry of Agriculture and Food.

A multimedia package: 378 slides in filmstrip; 3 audio tapes.

- 33 Operation and Maintenance of Machinery for Turf Designed to familiarize you with most aspects of machinery required in the maintenance, development and construction phases of turf. Machinery discussed: tractors, mowers, small engines, aerators, sod cutters, seed and fertilizer distributors, spraying equipment and allied machinery.

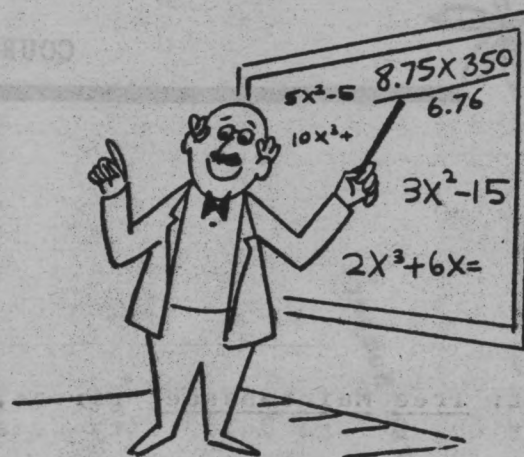
A multimedia package: 3 audio tapes.



- 26 Irrigation Designed to help you purchase and use irrigation systems with confidence. Topics include soil-water relationships, water supply and system capacity, sprinkler patterns, spacing and selection, sprinkler systems, pump calculations, irrigation cost analysis, portable system design, underground and automatic systems for turf, trickle irrigation, mechanized sprinkler systems and special applications.

- 218 Plant Nutrition An advanced study of soil-plant-air-water relationships. The course deals with factors affecting plant growth, nutrient uptake, soil colloids, supply and availability of the major nutrients, soil-water-plant relationships, and mineral nutrient deficiency symptoms.

Text: Nature and Properties of Soils, Brady, MacMillan Publishing Co.



- 4 Introductory Entomology and Pathology This course concerns pest management. You study the anatomy and physiology of insects, methods of control and chemical insecticides. Common diseases, their effects on horticultural plants and control measures are also discussed.

Text: Diseases and Pests of Ornamental Plants, Pirone, 5th Edition; John Wiley and Sons, Inc.

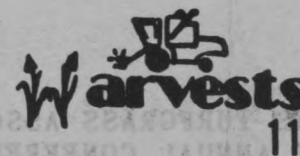
- 400 Pesticide Safe Handling and Storage If you sell insecticides and weed killers to home owners, this manual will tell you what you need to know about transporting, storing and displaying the products and handling emergencies. Also explains label information, your legal obligations and how to respond to questions on pesticide safety.

- 2 Soils for Horticultural Crops Soil is the main medium for growing horticultural crops. Soil composition, physical and chemical properties are examined with an emphasis on preparation for greenhouse, turf and park conditions. Availability and supply of major nutrients, air-water-soil relationships and soil acidity are explained.

A multimedia package: 39 slides in filmstrip; 1 audio tape

HOME STUDY IN TURFGRASS MANAGEMENT

continued

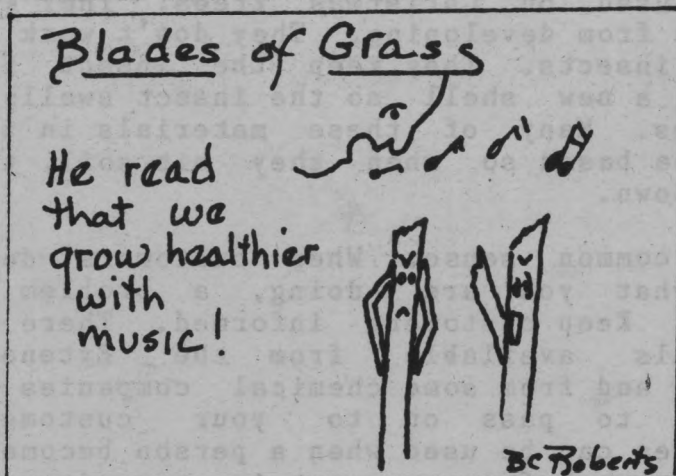


- 51 Urban Tree Management The urban forest is a highly visible resource valued in the billions of dollars across North America. This new course introduces an important aspect of urban forestry - tree management. Properly managed trees can provide both aesthetic and economic benefits in the urban setting. Sample topics: appraising a tree, how to do an inventory, planting, trees and the law, training and education. Foresters, arborists and anyone interested in trees will find this course useful.

A multimedia package: 80 slides on microfiche; 1 audio tape.

- 22 Arboriculture Through only 3.5% of North America is forested, trees dominate the landscape wherever they grow. This course studies trees in relations to their structure, propagation, soils, water and fertility needs; wound treatment, cavity work, bracing, cabling and landscape specifications. Shade tree evaluation and selection and tree disorders are included.

Text: Tree Maintenance, Pirone, 5th Edition, Oxford University Press.



- 52 Tree Care Equipment: A Manual As tree maintenance programs become more sophisticated, so does the array of specialized tools and equipment for tree care. This course guides you through the confusing selection and helps you choose, use and maintain these items wisely. The manual is divided into three parts: heavy equipment, personal equipment and general equipment, including a detailed section on knots.

A multimedia package: 60 slides on microfiche, 1 audio tape.

- 28 Landscape Planning of Large Areas Site analysis is the first step in landscape planning of large areas. The course also investigates maintenance and design, landscape details [water, paving materials, benches, etc] as related to industrial sites, picnic and park areas.



- 19 Landscape Design and Installation Plants and structures constitute a total living environment. This course presents design philosophies of space and circulation, varieties of ground patterns, pavement types, plant combinations and installation for large projects [parks and industry] as well as for home landscaping.

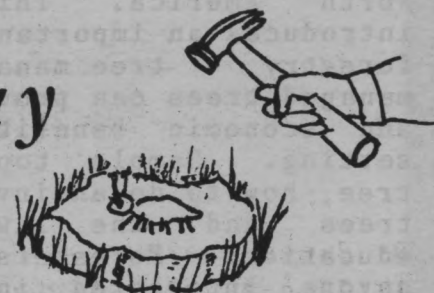
A multimedia package: 483 slides in filmstrip; 8 audio tapes.

- 37 Detailed Landscape Construction To the landscape designer soil is a design material. This course details the engineering properties of soils, grading and drainage and provides information relative to the use of concrete, asphalt and other hard paving materials. Also included in the text are sections on the construction of swimming pools, small garden pools and garden lighting.

- 42 Office Management for Parks Good management depends upon the efforts of a reliable work force. This course examines the systematic allocation and performance of work, personnel management and public relations procedures, as related to park administration.

Texts: Developing the Municipal Organization, Powers, Brown and Arnold, International City Management Association. Administration of Recreation, Parks and Leisure Services, Rodney and Toalson, John Wiley and Sons.

When Not To Spray



Dr Pat Cobb
Auburn University

The Lawn Care Industry is new. People work hard themselves or hire someone to establish a lawn. They are working and busy so need help to protect this investment.

Insects may eat you up, but hopefully, insects are responsible for only a small part of what you do for your lawns. Nine out of ten problems are PEOPLE problems rather than pest problems. YOU, AS A LAWN CARE OPERATOR, ARE IN THE PEOPLE BUSINESS.

When pest problems occur, you want to get the problem off your back. There are alternatives to consider. We are concerned now that the alternatives are shrinking, but we still do have alternatives.

There are times to spray, but don't spray when you don't have a problem. More call backs mean more money spent by you and your customer. Sometimes it is easy to soothe a customer by spraying whether the lawn needs it or not. Disease organisms are there all the time. Conditions allow these to become problems. But, insects move in. Only spray when you have them.

Education is our business. If you are in the people business, you are an educator. Some lawn care businesses now check on pests - selling this service. By using written materials and word of mouth, customers are told that the lawn care operator is scouting. If nothing is there to spray for, they won't spray.

When you have not diagnosed a problem, do not spray. Basic to any control problem with insects is diagnosis. Do it. Diagnose. Check for the problem. Use soap and water to see what is there. Measure what you find. Take a sample to send to a laboratory. You may have to wait for an answer, but usually this is a basis for more reliable service. Insect control is only one part of what you do, but if you don't know what is there, you don't know how to treat.

Timing is important. Don't spray at the wrong time. Target applications at the right time or you waste time and money.

There are alternatives. Don't spray when you have "something else". A hammer works every time. The resistant turfgrass varieties buys some time. There is good research going on. When we have the choice of using resistant varieties, it is a "something else" that we should use.

Some turf varieties contain endophytes - a plant within a plant - a biological control. Some of the turf type tall fescues and perennial ryegrasses have endophyte content. Endophytes resist surface feeding insects. We don't know what the story is but it goes a long way to protect lawns from surface insects. An alternative to spray.

Certain nematodes attack mole crickets - another biological control. Hopefully in some areas they may be a "something else".

Insect growth regulators are experimental. One is used on Christmas trees. They keep insects from developing. They don't work on mature insects. They keep the insect from forming a new shell so the insect swells up and pops. Many of these materials in turf are urea based so when they hit soil, they break down.

Use common sense. When customers don't know what you are doing, a problem is caused. Keep customers informed. There are materials available from the Extension Service and from some chemical companies to reprint to pass on to your customers. Brochures can be used when a person becomes a customer or before a certain procedure is used.

Use common sense. Don't spray when pets and people are on the lawn.

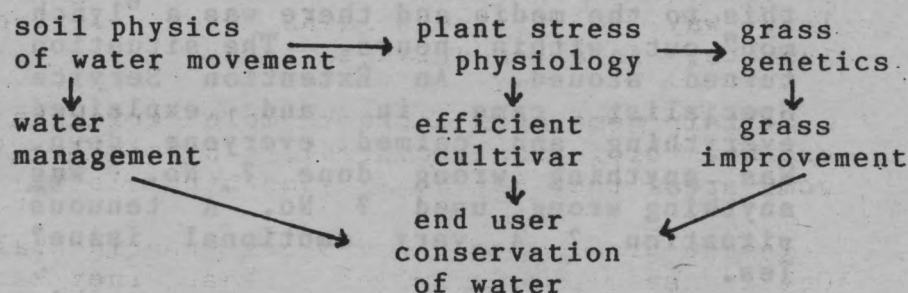
What are you selling? A service or a spray program? Consider alternatives. Start a scouting program. You are becoming a more professional profession. I don't see lawn service going down the drain. We may have to look at the fine print a little more and sift out what we can use. There are all sorts of alternatives. Keep your mind open. Do you see a sun rise or a sun set; are you an optimist or a pessimist? See a sun rise. With all the bad public relations received, it's time to place emphasis on good public relations and come out smelling like a rose.

CONSERVING WATER WITH EVAPOTRANSPIRATION CONTROLS

Dr James Beard
Texas A and M University

Lack of water is the most significant threat to the turfgrass industry in Texas and countrywide.

Research on turf Water Conservation VIA Evaporative Control has a goal of 50 - 70 % reduction in water use rate of turfgrass. There are many aspects to research in this area:



"Water use rate" has distinct properties. Evapotranspiration is the procedure that results in water loss from the soil by evaporation [E] and by transpiration [T] from plants. In effect, evapotranspiration is the moisture use rate.

Turfgrasses use water at rates varying from 0.1 to 0.3 inches per day. This amounts to about 1 inch a week.

The optimum temperature for growth of cool season grasses is 70 degrees F, while warm season grasses grow best at about 86 degrees F. The cool season grasses generally have a high moisture use rate. The hard, chewings and red fescues are all about the same. Warm season grasses generally have a lower moisture use rate - bermudagrass, bahiagrass, St Augustinegrass, hybrid zoysiagrass and seashore paspalum.

Grasses with rapid leaf extension, low density, broad leaves have high water use rates. Turfgrass canopy resistance to moisture loss can account for 60 to 65 percent of the total. Small leaf area means less moisture loss. A vertical extension of leaves increases moisture loss. A more horizontal leaf orientation in the canopy

conserves moisture. Research indicates that Texturf 10 and Bayshore bermudagrass have a low water use rate. Tiflawn, Pee Dee, Midway, Rifway, Vamont, Everglades, Midiron, Tifdwarf, Common, Sunturf, Texturf II and Tifway II bermudagrasses have a medium water use rate. And, Ormond and Santa Ana bermudagrasses have a medium high water use rate.

Cultural practices affect water use rates. In general, anything that stimulates leaf growth will increase water use. An increase in the clipping height will increase water use. Nitrogen fertilization will increase water use.

If the height of cut is so low as to restrict root development, the turf may be unable to obtain water in what would be considered a normal root zone. In this instance, increasing the frequency of irrigation to provide more moisture in upper soil levels is necessary. It is likely that the more you irrigate, the more you will have to irrigate. A deep root system is the best possible means of drought avoidance and water conservation.

Evapotranspiration may increase 25 % - 35 % over 5 days with leaf extension. Anything you do culturally to increase leaf extension increases water use rate.

Growth regulators: - Cutlass- brings about a significant leaf reduction. St Augustine may have a 10 - 35 % reduction in water use rate; bermuda - 5 - 30 % less. This may be a new dimension to growth regulators that will help make them more cost effective.

Stomata that close earlier will conserve water, since moisture vapor diffuses out of the leaf through the stomata.

Low water use for turfgrass and associated cultural systems will result in: 1] water conservation; 2] reduced mowing; 3] more effective use of fertilizer; 4] less weed problems, i.e. poa annua; 5] less disease problems; 6] reduced soil management problems; 7] better playing surfaces; 8] reduced management costs.

Most important research to insure future of turfgrass industry as water becomes of limited supply, particularly in urban areas.

Environmental Protection Agency laws and regulations

Barry Troutman
ChemLawn Corporation

There are many regulatory issues these days. The basic science issues are easier to understand and deal with and the political issues harder. Some examples:

- State transportation departments deal with intrastate regulation. Lawn care firms can't just load a tank and go out. All vehicles with gross weight over 10,000 lbs are regulated. The bill of lading must be updated for each lawn serviced. The driver has to be over 21 and have a valid medical examination each two years and pass a state examination. State DOT regulators will inspect. Reporting of violations causes an inconvenience. Transportation of insecticides is often an issue.
- Brown water: In southern Florida an underground aquifer is often the sole resource of drinking water. Regulations that deal with potential polluters are in force. Established free zones around well heads help keep water pure. Ft Lauderdale, [Broward County] businesses have had to move in some instances. Lawn care businesses and filling stations are regulated. Originally they wanted to regulate amounts of fertilizer per application and yearly applications and to ban pesticides, etc but this was negotiated. The ability to analyze water to parts per quadrillion creates a political issue. Small amounts of chemicals may be detected but harmless. This is difficult for the public to understand.
- LUST - leaking underground storage tanks. Fuel tanks are a problem. Both wells and underground leaks are monitored. There is a large bill to pay for the clean up of ground water if a tank leaks. Double wall tanks or concrete coffins are necessary at times.



- Example of what can happen: In a mid-sized city in a neighborhood that understands pesticide use, the school board contracted for a lawn care company to spray the school grounds. The company contacted the principal about the date and about keeping the children off the playground. At 10 AM the operator was on the job spraying and everything was OK. About that time a mother came to the school to pick up her child and saw the sprayer. She asked "What are you doing? What are you using?" 2,4-D was in the spray. She reported this to the media and there was a "lynch mob" out within hours. The situation turned around. An Extension Service Specialist came in and explained everything and calmed everyone down. Was anything wrong done? No. Was anything wrong used? No. A tenuous situation? A very emotional issue? Yes.

The Lawn Care Industry in trying to create a more beautiful environment can come out with a black eye.

Local regulations in some places require a company to notify people and neighbors ahead of spraying and post signs. How you make decisions based on these regulations is important to your business.

Chemicals create concerns. Scientific studies may contradict and arrive at different conclusions but questions are raised and people react.

Turf is an effective filter on the ground surface to help purify ground water, control erosion, allow more rain water into the soil. It has an intrinsic value that enhances our quality of life.

Everything has its toxic level. There is about 20 % oxygen in this room. If it were increased to 95 %, within several hours it would be life threatening. Vitamin D is added to milk and is beneficial but at a 95 % level, it is rat poison. Toxicity is a part of everything around us. The question is, what is reasonable toxicity? This has to be balanced with the positive aspects of the landscape.



New Seeded Bermudagrass Has Superior Performance

Keeping a nice looking, green lawn in the Southwest will be a little easier with a new bermudagrass variety released from the New Mexico State University Agricultural Experiment Station.

Named NuMex S-1 by turf breeder Arden Baltensperger, this new variety has good spring and summer green color. Quality and performance tests indicate it will grow and look better than the variety Common in much of the Southwest.

According to Baltensperger, NuMex S-1 is suitable for general turf use throughout the bermudagrass belt. It has medium texture, density and plant height. It is denser- and shorter- growing than Common.

NuMex S-1 is a seed propagated cultivar. Baltensperger, along with graduate students, started development of NuMex S-1 from a polycross of 16 parental clones selected for high turf quality characteristics and good seed production. Based on performance, eight of the 16 original clones were intercrossed. Two additional cycles of selection for shorter internode length and increased density resulted in the new variety.

Performance testing was made at 12 sites in the southern part of the United States.

Some breeder seed is available. Seed increase will be on a three generation basis and grown under the supervision of the New Mexico Crop Improvement Association.

Turf Trivia

What was the Palouse region named for ?

University of Wisconsin
Leonard Johnson

"The hauntingly beautiful Palouse region was not named for the Palouse River, nor for an Indian tribe of that name. Instead, all three names were derived from the French noun 'pelouse,' which means 'lawn' and was probably used by early French explorers to describe the grass-covered hills of that region."

ANSWER:

Thick, Healthy Lawn Reduces Pollutants in Water Runoff To "Next To Nothing"

By George Wiegel, Patriot News *

Pesticide runoff from lawns may not pose nearly the threat to water pollution that some believe, a Penn State University research says.

Dr Thomas Watschke, a professor of turfgrass science, says studies under way at University Park show a thick, healthy lawn reduces runoff "to next to nothing."

"Thick lawns slow the velocity of runoff and allow the water to infiltrate," he said. "We've found differences of the magnitude of 15 times between runoff from a high quality lawn and that from a patchy lawn with a lot of weeds."

What that may mean to homeowners is that concerns about pesticides running off into water supplies may be overblown.

"Claims are being made about the runoff from turfed land without data to back them up," Watschke said.

The Penn State study involves 12 sloped plots of seeded and sodded lawns. The 1,300 square foot plots range in quality from thinly vegetated to thickly vegetated.

When it rains, water runs into a catch basin, where automatic equipment measures the rate and amount of runoff every 60 seconds.

Water samples are collected so the nutrient and pesticide content can be analyzed.

Herbicides were applied to the test plots last fall, but the amounts found in the runoff have not yet been analyzed.

Watschke said the research so far has concentrated on the rate of runoff.

"The next step will be to add commercially available, registered pesticides and nutrients to study their effects," he said. "This will finally put the horse before the cart. It will tell us what we don't know about what has already happened and is happening."

Watschke said he believes the research will show that when a homeowner has a thick, dense lawn, almost all of the pesticides he or a lawn-chemical company applies stays on the site.

He said infiltration into the ground is much more desirable environmentally than having the pesticides run off because microbes in the soil break down the chemicals into harmless materials.

In the runoff tests, Watschke found that the highest-quality plot - a sodded plot without soil patches showing through - registered a runoff rate of about a half gallon a minute during peak rainfall.

By comparison, 7.5 gallons of water a minute ran off a neighboring plot that was thinly seeded and had bare areas separating clumps.

The tests showed that sodded plots did a much better job of reducing runoff than seeded plots four months after the lawns were established.

Watschke said the study also is the first to document the actual amount of runoff coming off lawns.

Civil engineers now must rely on figures from pasture runoff studies when designing water-collection systems for residential developments.

Watschke said pasture runoff figures are much greater than lawn runoff figures because pastures are more compacted and not as thickly vegetated as lawns.

He said as a result, the water-collection systems in developments probably are designed to handle more water than is likely to occur - at least that water coming from vegetated areas.

"It doesn't particularly bother me, though, that water-collection systems are probably overdesigned," he said. "That serves as a fail safe."

The study is being conducted at Penn State's Landscape Management and Water Quality Research Center and is being funded by the university, the Pennsylvania Turfgrass Council and the professional lawn-care industry.

* This summary of Dr Thomas Watschke's research is from "The Patriot," Harrisburg, PA, July 1, 1986.

BOOKS AND REPORTS OF IMPORTANCE



In order to help keep subscribers to Harvests up-to-date on important sources of new information related to lawns and sports turf, several relatively new releases are called to your attention. Additional information may be obtained from the publisher.



THE DOSE MAKES THE POISON

by Dr M Alice Ottoboni

Vincente Books

P O Box 7388

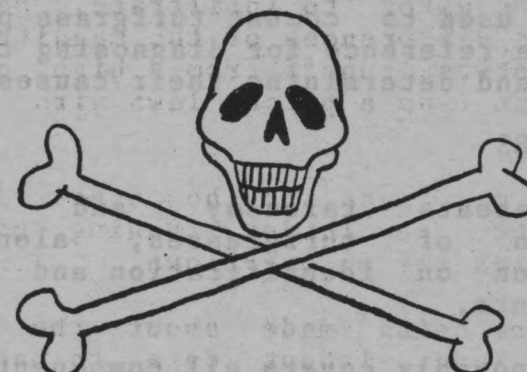
Berkeley, California 93707-0388

222 pages - 1984

"M Alice Ottoboni, PhD, wrote this book to demystify, for the public at large, the science of toxicology. Readers with little or no science education will soon be able to make sense of news stories about toxic threats and, more important, come to understand the significance of their own exposures to chemicals in the home and work environments.

"What are chemicals? How are they classified? How can they damage us? These questions are answered in the opening chapters in straightforward language, with a simple definition provided for every technical term introduced. Early in the book, Dr Ottoboni begins to dismantle the framework in which the public is accustomed to operating. Chemically speaking, 'natural' does not equate with good and 'man-made' with bad. Nor is biodegradability always a desirable trait.

"What factors influence the toxicity of different substances? Dr Ottoboni discusses the roles of dose, frequency of exposure, species, individual susceptibility, and other factors and explains the difference between acute and chronic toxicity in the book's middle chapters. Then three chapters are devoted to the more emotion-laden issues of mutation and cancer. The balance of the book



deals with some widespread misconceptions, such as that once a chemical stores in the body it remains there forever, and topics of general interest, such as Agent Orange and indoor air pollution.

"In keeping with her aim to educate the public, Dr Ottoboni has incorporated into her book a generous amount of useful reference material. In the text are a table of antidotes and a table of the federal agencies that regulate chemical substances. An extensive glossary and a table of abbreviations appear as appendices, along with a recommended reading list. Finally, there is a detailed index.

"The Dose Makes the Poison" is not a tract for or against chemicals, but an objective exposition of what makes them harmful or harmless. Dr Ottoboni urges us to look at our present-day situation from a new perspective:

"All living organisms since the beginning of time have had to deal with exposure to numerous noxious substances. No animal on earth could survive a day, much less live to reproduce future generations, if it were not capable of handling small amounts of a wide variety of foreign chemicals. It is only when we overwhelm the natural defense mechanisms of our bodies, by taking in too much at one time, or too much too often, that we get into trouble."

TURFGRASS MANAGEMENT-

Revised Edition



by Dr A J Turgeon

Reston Publishing Company
A Prentice-Hall Company
Reston, Virginia 22090

416 pages - 1985

"The updated version of this practical, comprehensive text helps turfgrass management students develop effective cultural programs. Dozens of new illustrations augment this already heavily illustrated text to clearly convey important concepts, processes and relationships. Provides specific recommendations for applying the newest pesticides, fertilizers and other materials used to combat turfgrass problems. A valuable reference for diagnosing turfgrass problems and determining their causes.

"FEATURES

- "Presents taxonomy and climatic adaptation of turfgrasses, along with information on identification and cultural requirements.
- "Thoroughly covers all components of the turfgrass environment [atmospheric, edaphic, and biotic.]
- "Clearly explains how to establish and sustain turf at a desired level of quality.
- "Reviews, then gives directions for construction of a cultural system based upon specific objectives and prevailing conditions.
- "Adds more than 30 new illustrations of seed heads and blade characteristics to show the latest turfgrass varieties.
- "Includes discussions of all the new pesticides.
- "Updates section on turfgrass diseases to include recently discovered organisms, new disease names, and more.

"TEACHING/LEARNING AIDS

- "Examples are taken directly from observations of live samples selected from field turf.
- "Hundreds of illustrations include line drawings, plant diagrams, and charts.
- "Thorough glossary defines all technical terms.
- "Appendix includes information on pesticide chemistry, calculations, and conversions."

LABORATORY MANUAL FOR

TURFGRASS MANAGEMENT

by Dr Mark S Welterlen

Prentice Hall Inc
Englewood Cliffs, New Jersey 07632

202 pages - 1987

"Laboratory Manual for Turfgrass Management is a compilation of practical exercises which provide beginning students with the hands-on experience they need to become proficient in the area of turfgrass management. Beginning chapters introduce students to turfgrass uses and botanical characteristics. Other chapters include exercises in turfgrass establishment, renovation, mowing management and irrigation. Students are also introduced to the basic calculations used in sprayer and spreader calibration; cost comparisons for purchasing pesticides, fertilizer and turfgrass seed; and determining seeding rates, as well as fertilizer and pesticide rates, based on label information. The last three chapters emphasize turfgrass pest identification, and the last chapter reinforces information presented in earlier chapters by introducing students to diagnostic techniques.

"This book is intended as a companion text to Turfgrass Management authored by A J Turgeon and published by Reston Publishing Company, Reston, VA. An instructor's manual, list of references for further reading, and a glossary are included to aid the instructor and student in meeting the stated educational objectives for each exercise. This book is ideally suited to beginning students enrolled in turfgrass management courses offered by colleges and vocational/technical schools, and it may also act as a core text in professional turfgrass manager employee training programs."





CONTROLLING TURFGRASS PESTS

Harvests
19

by Dr Malcolm C Shurtleff
Dr Thomas W Fermanian
Dr Roscoe Randell

Prentice-Hall Inc
Englewood Cliffs, New Jersey 07632

449 pages - 1987

"Designed for the practicing professional turfman and those in allied professions, this book provides you with the most up-to-date information available on the identification, biology, control and management of every type of turfgrass pest.

"Those of you who strive to achieve a dense and uniform turf, free of weeds, insects, diseases, and other pests, will find this book a valuable resource. By writing this reference in every-day language, and not loading it with unnecessary scientific terminology, the authors enable a wide range of individuals to benefit from its contents:

- Golf course superintendents
- Professional lawn care company personnel
- Home lawn enthusiasts
- Managers of athletic fields, parks and cemeteries



- Students in turfgrass management, landscape architecture, plant pathology, and economic entomology
- Entomologists, weed specialists, and plant pathologists
- Garden store personnel.

"The aim of this book is to show you how you can successfully manage all types of turfgrasses - proper planting, fertilizing, watering, mowing - and how you can successfully control those elements that damage all that hard work. You'll find out how to accurately diagnose the onset of infestation. Also, you'll gain a knowledge of the pest's life cycle, when and where the pest will attack, and how the pest can be eliminated.

"Sixty color plates plus some 400 photographs and line drawings make this one of the most heavily illustrated books of its kind. Comprehensive tables on management practices and current turfgrass materials, lists of disease-resistant turfgrass cultivars, and charts listing control chemicals used to keep turfgrass pests in check will make this book a valuable and long-lasting reference."

INTERACTIONS OF SOIL MINERALS WITH NATURAL ORGANICS AND MICROBES

Edited by Dr P M Huang
Dr M Schnitzer

Soil Science Society of America
677 South Segoe Road
Madison, Wisconsin 53711

606 pages -1986



This Soil Science Society of America publication number 17 has compiled the proceedings of a symposium sponsored by the Society in Washington DC in August of 1983. The subjects covered in this publication relate to reactions of organic compounds at the soil mineral surface. Scientists studying reactions between organic and inorganic compounds occurring in various soils are utilizing nature's laboratory to determine why and how these reactions take place. It is the only way such reactions can be studied in most instances because of the small amounts of the compounds undergoing change, or the long time needed to detect the change. Carbon-containing compounds, in particular, are subject to degradation and it is an unusual compound that does not undergo appreciable change over time.

"Society has many environmental concerns, particularly in the disposal of synthetic organic compounds that have various biological toxicities. Many of these compounds require careful handling and disposal. It is in the best interest of society to know that many of these toxic compounds have the least chance to persist in their toxic form if exposed at the soil surface. In fact, evidence is accumulating which leads some to believe that many organic compounds have a predictable half-life in surface soil. In other words, their toxicity is reduced to half over a period of time. It would serve society well to accumulate all of the evidence possible in such matters of great concern to many people so the most practical and economical decisions are reached."

NORTH CAROLINA TURFGRASS SURVEY

Conducted by - North Carolina Crop and Livestock Reporting Service
- Turfgrass Council of North Carolina

Turfgrass Council of North Carolina
P O Box 5395
Cary, North Carolina 27511

76 pages - 1986

"The Turfgrass Council of North Carolina sponsored a survey to determine the size and value of turf in North Carolina. The survey was conducted by the North Carolina Crop and Livestock Reporting Service of the North Carolina Department of Agriculture.

"The turfgrass universe was broken down into 15 segments or strata for sampling and summarization purposes. The segments, number in each segment and percent tabulated are as follows:

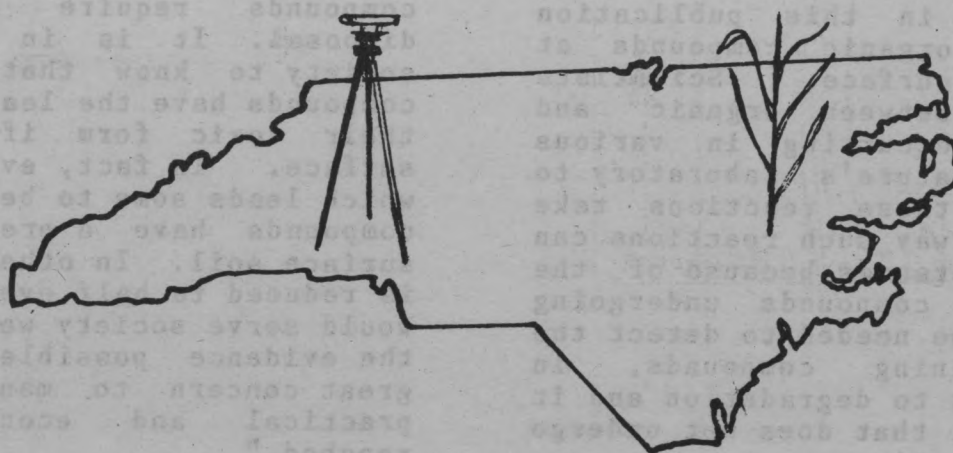
Segment	# Mailed	% Returned
Airports	144	28
Athletic Fields	202	11
Cemeteries	158	21
Churches	6939	11
Commercial/Mult Dwellings	-	-
Garden Centers	1652	50
Golf Courses	478	81
Homes	-	-
Institutions	707	25
Landscapers	941	21
Lawn Care Firms	110	25
Parks	385	19
Roadsides	-	-
Schools	284	18
Sod Producers	11	82

"Four questionnaire versions were developed to collect the information from all segments. One version was used for golf courses, one for garden centers [sales], one for homes, commercial and multiple dwellings, and one for all other segments.

"A land area sample was used to estimate the homes, commercial, and multiple dwellings portion of the universe. Personal interviews were conducted in 140 selected area samples by trained enumerators from the North Carolina Crop and Livestock Reporting Service. A total of 1,090 home owners were interviewed and the data were expanded by the land area expansion plus the reciprocal of the sampling rate in areas that contained over 15 homes.

"The North Carolina Department of Transportation provided data for all state maintained roadsides. All other segments were mailed three requests of the questionnaire and a telephone follow-up was conducted for golf courses and sod producers.

"Churches were the only segment that was sampled. Since there were over 6,900 churches on the list, a sample of 695 was drawn and mailed the questionnaire. In constructing the mailing list for the survey, each county school system was treated as one unit and mailed one questionnaire. The same was true for parks and athletic fields. City and county parks and athletic fields were treated as individual units for sampling and reporting. Most segments are reasonably complete with the exception of cemeteries. A total of only 158 cemeteries were on the mailing list which is probably only a small portion of the total in the State."



TURFGRASS INSECTS OF THE UNITED STATES AND CANADA

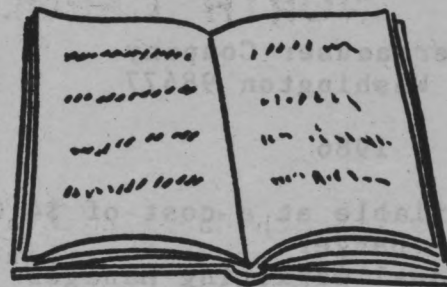
by Dr Haruo Tashiro

Cornell University Press
124 Roberts Place
Ithaca New York 14851

391 pages - 1987

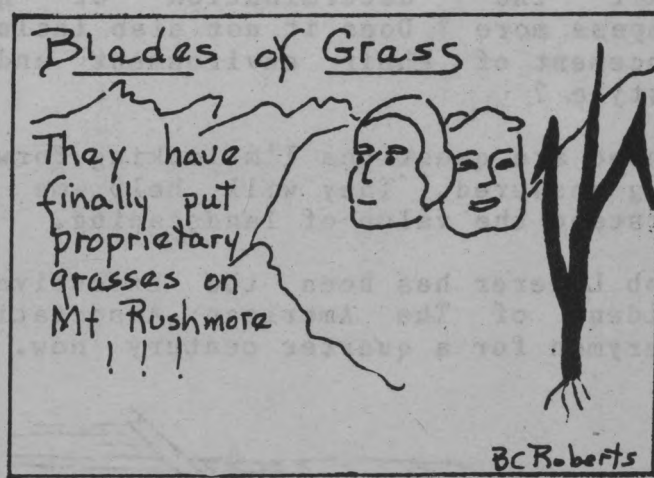
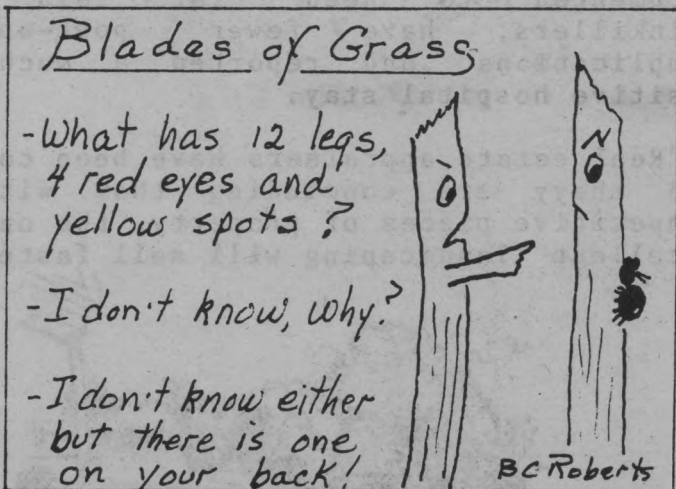
"This book is the only comprehensive English-language text-reference on turfgrass pests - insect, related arthropod, and vertebrate - in the continental United States, Hawaii and southern Canada. It should prove invaluable to both the professional entomologist and the commercial turf manager.

"Haruo Tashiro first discusses the turfgrasses that are the most important agronomically and offers fundamental information on insects and their near relatives. In following chapters he treats each major insect or group in the same sequence, covering taxonomy, importance, history and distribution, host plants and damage, description of stages, life history and habits, and natural enemies, making it easy to compare a given subject between different groups. He also considers the destructive vertebrate pests that are attracted to turfgrass by the presence of insects, and he provides an overview of turfgrass-insect associations, detection and diagnosis of insect infestation, survey techniques, and principles of strategy and control.



"In 64 full-page color plates, more than 475 photographs depict some stage of practically all turfgrass insects found in this country and Canada, making possible the identification of pests and promoting understanding of their habits. The book also contains more than 200 illustrations in 90 figures including many distribution maps, life history charts, and identification line drawings.

"Containing substantial technical material for the professional entomologist as well as information for turfgrass managers with limited or no entomological training, this book fills a long-standing need."



THE VALUE OF LANDSCAPING

by The Weyerhaeuser Company
Tacoma, Washington 98477

28 pages - 1986

Copies available at a cost of \$4.00 each
from: Steve Barger

National marketing Manager
Nursery Products Division
The Weyerhaeuser Company
Tacoma, Washington 98477

The introduction to this excellent publication poses the question, "What is the value of the products we produce and market?"

"Now that's a question we would all like to have answered. Armed with such information, we can better market our products and I for one am eager to find these answers.

"Recently a term has come to the forefront in today's marketplace. Value. What is value and how is it determined? I've heard that value is a perception of the customer when the factors of price and quality are taken into consideration.

Quality factors are hard to determine. What are they and what do they mean to different people? No one in this industry has ever purported to grow or sell less than quality products. Does quality mean that the plants offered will live longer, grow bigger - maybe greener and fuller - or is it a combination of all of these? To our customers, and our customers' customers, doesn't the determination of quality encompass more? Does it not also include the enhancement of their environment and their lifestyle?

"These are questions I'm looking forward to having answered. They will help me better understand the value of landscaping.

"Bob Lederer has been the Executive Vice President of The American Association of Nurserymen for a quarter century now. He's

seen our industry grow and knows the importance of our products. Here is what he recently said:

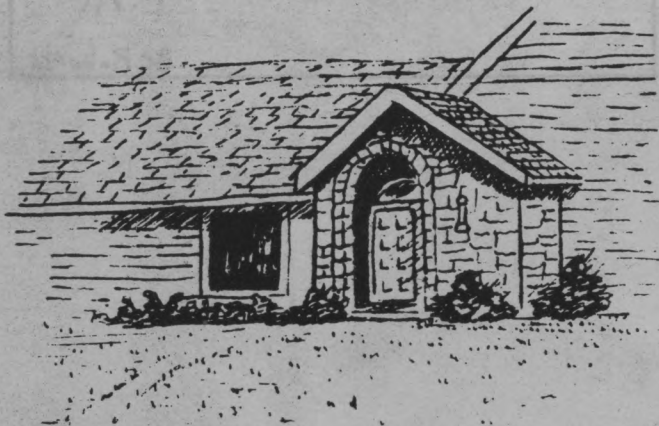
- 'America's acceptance of living plants in the landscape is about equal to that of motherhood and apple pie. There are various reasons for this. There's the human need which has existed since creation for man to be near green, growing trees and shrubs in the environment. There is also the service performed by those gifts of nature such as sight screens, sound barriers, air purifiers, wildlife refuges and more.
- 'Research has shown two benefits to be the strongest purchasing motivators. On an emotional level the most powerful stimulus is beauty. Most people just simply like to have a nice looking yard. The strongest practical inducement is the increase in property value made by attractive landscape plantings.'

The September 1986 issue of The C A N Bulletin provided the following summary:

"In 1985, 84 %, or a total of 74 million U S households participated in one or more forms of lawn and garden activities, an increase of 6 million households in the last four years. According to the 1985 Gallup Organization's Audit of Leisure and Sports Activities, gardening ranked as the number one outdoor leisure-time activity of American households.

"It has been documented with a nine-year study by Dr Roger S Ulrich that hospital patients with a view of a landscaped area spent only 7.9 days convalescing compared to 8.7 days for those who did not have a view. In addition, those with a view were documented to need far less potent painkillers, have fewer post-operative complications and reported a much more positive hospital stay.

"Real estate appraisers have been consulted and they are concluding that with two competitive pieces of property, the one with excellent landscaping will sell faster than



The Value of Landscaping continued

the one with average landscaping. To establish an opinion level, appraisers were asked whether they agreed or disagreed with two basic statements about landscaping. The statement was 'does landscaping add to the dollar value of residential real estate?'; 95 % said 'yes'. 'To commercial real estate?'; 86 % said 'yes'.

"A report by one of America's leading forecasters of social change, the firm of Yankelovich, Skelly and White, Inc, notes the following: 'We expect that gardening will to some degree benefit from the renewed emphasis on home-based leisure, and that this will extend to vegetable, ornamental, lawn care and flower/plant cultivation. The character of leisure time is changing...' This firm's 1985 survey reported that 35 % of the people said that having a beautifully landscaped or exceptionally well cared for lawn and garden is associated with success.

"The Gallup landscaping survey determined that overall new home buyers, and buyers of previously owned homes estimate that landscaping, on the average, adds 14.87 % to the value or selling price of their home. 62 % of all U S homeowners felt that landscaping is as good or better an investment than the investment in other types of home improvement such as remodeling.

"Types of plant material planned for home landscapes were in this order from # 1 to 9: annual or perennial flowers, ornamental leaf or flowering shrubs, patio container specialty plants, ornamental or shade trees, evergreen shrubs, groundcovers or vines, evergreen trees, fruit trees and last, other plant material.

"The nursery and lawn and garden market is full of opportunity and nothing points this out better than a review of the demographics of today's buyer.

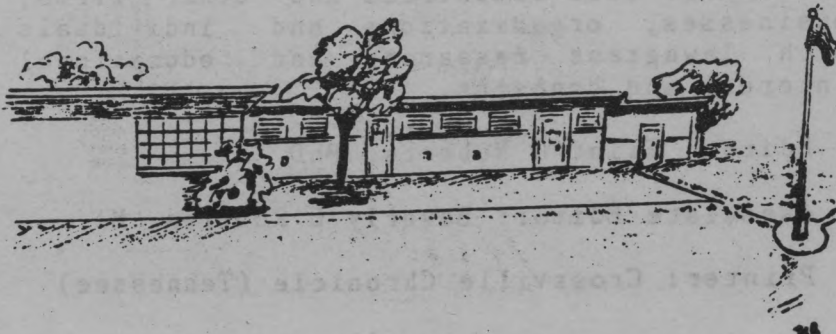
"As baby-boomers become an increasingly larger segment of the U S household population, they also become the most important customers for lawn and garden products. 1985 was the first year that household age groups of 30 to 49 year-olds emerged as the nursery and lawn and garden

industry's most important consumers. In that year, 50 % of all lawn and garden retail sales were made to this age group.

"For the rest of the decade, U S population growth will create an extremely favorable climate for increased lawn and garden participation. Between 1980 - 1985, the U S household population increased by approximately 7.5 million, from 80.4 to 87.9 million. From 1985 to 1990, the U S household population is expected to increase another 15 % to an estimated 101.1 million.

"In fact, between 1980 and 1990 the number of households age 35 to 44 is expected to increase by 54 %, a rate that is more than double that of any other age segment of the U S population.

"Interesting statistics include this: the sex of the purchaser is 49 % female, 51 % male; age of purchasers is 16 % 50 years and over, 27 % 18-29 years old and 56 % 30-49 years old. Education of the purchaser is 48 % high school graduates and 49 % college graduates with 3 % grade school graduates. Occupation of purchaser is 36 % manual labor, 9 % retire, 26 % business, 25 % professional, 1 % farmer and 1 % other. Size of community lived in by purchaser is 5 % small town, 12 % city, 35 % rural and 50 % suburb."





THE LAWN INSTITUTE

County Line Road
P. O. Box 108
Pleasant Hill, Tennessee 38578-0108

Bulk Rate
U. S. Postage
PAID
Pleasant Hill TN
Permit No. 3

ADDRESSEE....
HELP US KEEP
YOUR ADDRESS
CORRECT.....
If address is wrong
in any respect, please
correct directly, and
return to us.
THANK YOU

K T PAYNE
MI ST UN
CROP & SOIL SCI
E LANSING
MI 48824

Lawn Institute Harvests is published four times a year by The Better Lawn and Turf Institute. The headquarters office address is P O Box 108, Pleasant Hill, Tennessee 38578-0108. Phone: 615/277-3722. Inquiries concerning all aspects of this publication may be addressed to the headquarters office.

The Better Lawn and Turf Institute is incorporated as a nonprofit business league formed exclusively for educational and research purposes concerned with agronomic, horticultural and landscape concepts.

Lawn Institute Harvests is dedicated to improved communications among turfgrass seed and allied turf industries and other firms, businesses, organizations and individuals with lawngrass research and educational interest and concerns.

Editor: Eliot C Roberts, PhD

Associate Editor: Beverly C Roberts, MA

Printer: Crossville Chronicle (Tennessee)