

# BETTER LAWN -- HARVESTS

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991 WEST FIFTH STREET  
MARYSVILLE, OHIO 43040  
PHONE: (513) 642-1777  
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## YEAR ENDS ON UPTICK

Two well received reprints ("Curious About Cultivars" from Weeds, Trees and Turf, and "How Stands Your Grass" from Club Management) mark the ending of the 1976's final quarter, with other items "in the works" ("Lawn Logistics" for Changing Times Magazine, "All Season Lawn Seeding" for Flower and Garden, as example). Our contribution to the Supplement (issued in tandem with four other associations, through Pflaum), and our own Press Kit, have been prepared: they will be in production during January for February issuance! We have received a nice "thank you" from Francina Johannson, for our help on the Maryland Center for Public Broadcasting Consumer Survival Kit (entitled "Lawn and Order"), and the preliminaries are out of the way for presentation of a paper entitled "Evolution of Lawn Cultivars in America" before the Third International Turfgrass Research Conference, at Munich, July 11-13, 1977.

The Marysville Staff thanks all the membership for its support and interest during 1976, and wishes everyone a prosperous New Year. Some modest physical changes to the Institute are expected in 1977, what with Seed Technology (with whom we have shared the present building for 20 years) having built a new laboratory east of town, expected to be occupied momentarily. Our office will retain the same, rural delivery address, letterhead, and telephone, but we will not enjoy the technical interchange and exchange of facilities had in the past. On the bright side we will doubtless gain some additional storage space in the present building, even if a new companion tenant is secured for the vacated quarters. Unfortunately the cost of maintaining our operations is bound to be affected adversely since utilities will not be covered and expenses on many essentials can no longer be shared.

It appears as if the New Year will be off to a good start, in a slowly rising economy. Power equipment sales gained modestly in 1976, and are projected to gain similarly in 1977. Commercial exhibits at trade shows have seemed to be bigger and better than ever, with commercial interest (including several seed firms) aggressively active. And the price of wheat has dropped sufficiently so that wheat-growing is not so competitive to lawnseed in the producing areas.

Again, a hearty thanks to everyone, and our very best wishes for the year ahead, from the Marysville staff.



## CONSUMER SURVIVAL KIT APPEARS

"Lawn and Order" is the title given the newly developed Consumer Survival Kit, issued by the Maryland Center for Public Broadcasting in conjunction with its television release about lawns. The CSK contains background information, attractively edited from authoritative sources. The Institute is favored with a number of mentions and excerpts.

A PBS objective is to educate consumers so that they may purchase more intelligently. Miss Johansson notes on the cover, "if the buying citizenry is purchase wise, the time will come when all businesses will have to produce quality products, - - -".

This 24 page booklet opens with an inside front cover summarization, "Lawn Care", as researched in-house. The first facing page, "Improved Grasses for the Lawn", originated with the Institute, first appearing in Changing Times in 1973. The Institute is fully credited, and all of the "Institute varieties" as of that date are itemized in bold face, and described. A dozen select bluegrasses, four fine fescues, several bentgrasses and perennial ryegrasses are all emphasized, their use regionally related to the map prepared for the Changing Times story.

Next comes "Grass Seed Labels", researched in-house. Then a lengthy item condensed from a 3M publication of 1975, "Planting and Caring for your Lawn". This is well illustrated with drawings, but unfortunately so details lawn tending procedures as to make them seem more burdensome than they need be (a homeowner can dispense with such things as hand spading the seedbed, mixing an extender with the seed, using elaborate checks for levelling the soil, aerifying, dethatching, etc., etc.).

Briefer, helpful items follow, including "A Mini-Course in Chemistry" (about fertilization), "If you use Pesticides" (a warning to be careful), "Ingredients of a Pesticide" and "Weed Control", all from authoritative sources.

The Institute story appearing in the May 1975 issue of Horticulture follows, this time under the title of "The Worst Weeds" (it appeared originally as "A Bakers Dozen of the Worst Lawn Weeds"). Then come discussions of "Outdoor Power Equipment", "Easy-Care Ground Covers", and "Those Companies that Promise Prettier Lawns" (the new lawn service industry). The booklet winds up with a "Selected Reading List" of 14 titles, of which two are books by Dr. Schery and two others encyclopedias for which Dr. Schery prepared the sections on lawns.

We are not certain how "Lawn and Order" is distributed, or if copies can be obtained upon request. But Miss Johansson states, "The 'Kit' is finding its way into homes, schools and libraries from coast to coast, as well as in Guam and Hawaii. Canadian viewers, watching the series on cable television, are also requesting the 'Kit'." So it should provide a lot of fine coverage stressing use of improved grass cultivars and topflight care.

## STORY ON FERTILIZATION

"Lawn Fertilization", an Institute story by Dr. Schery, appeared in a winter 1976 issue of the Turf Bulletin (Massachusetts Turf and Lawngrass Council). The story emphasizes changes arising from the "energy crisis" and increasing cost of fertilizer. Tables comparing cultivar performance under low fertilization show some of the top varieties performing no better than others which normally rate farther down the scale. For coaxing the best out of most topflight cultivars, at least moderate fertilization seems called for and should be encouraged.



### SUPPLEMENT PREPARED

The 1977 spring "Supplement", issued in cooperation with several other associations, through William Pflaum, was completed in November. The Institute, with help from the Lawn and Turfgrass Division of ASTA, contributed 16 pages of text, embracing 24 titles, about lawns and the usefulness of lawn seed. Seven photographs were included, although probably seed trade illustrations will be restricted to 4 or 5 unless other cooperating associations do not fill their quotas. As in past years, the "Lawn and Garden Supplement" is intended for a broad mailing in newspaper column format, to several thousand newspapers, trade magazines and other publications nationally. It is designed especially for the smaller dailies and weeklies not large enough to have their own garden editor who would compose and organize gardening materials.

### BOOK REPORT APPEARS

Dr. Schery's report on the Morton Book, Folk Remedies of the Low Country, appeared in the October issue of HortScience. Although only indirectly concerned with lawngrass, the item does reflect the Institutes broad interest and participation in affairs of the professional horticulturists.

### FLORIDA TURFGRASS

Harvests has cited previously a Florida turfgrass survey, which is concisely summarized again in the September/October Turf-Grass Times. Home lawns account for nearly 2/3 of the acreage, with highways and golf courses a distant second and third. In total expenditures (maintenance and new turf) homes account for about 3/4, with golf courses about 1/10, apartments and condominiums a distant third. This expenditure is equivalent to nearly 1/4 of the cash receipts from the sale of all farm commodities in Florida, and establishes turf as second only to citrus in importance.

In acreage, bahia was the most used turf species, followed closely by st. Augustine, and distantly by centipede; considering only home lawns st. Augustine constituted 46% and bahia 36%. Bermuda, Zoysia and other less used species shared only 11% of the turf planting acreage, a rather surprisingly low figure.

### DEMAND HEAVY FOR REPRINTS

"Curious About Cultivars", from the October Weeds, Trees and Turf, has enjoyed heavy demand for reprints. Several members and correspondents have requested over 1000 reprints since the story appeared.

### AN APPRECIATION

A December 16 letter from Francia Faust Johannson from the Maryland Center for Public Broadcasting to Dr. Schery states, "It's the interest and assistance from people like you that make [Consumer Survival Kit] possible. The entire staff joins me in thanking you".

### LAWN GRASS STORY

Paul Trachtman, editor of Horticulture, telephoned around New Year that the magazine would prefer to use drawings from The Lawn Book in a story authored by Dr. Schery for late winter appearance. This will be a simplified presentation about useful lawn species.



### STORY APPLAUDED

We have this kind comment from Dr. C. R. Skogley, Professor in charge of turfgrass research at the University of Rhode Island: "Just a note to say what a tremendous job you did with your article "Curious About Cultivars" in the October issue of Weeds, Trees and Turf. It is the most comprehensive and valuable update I have ever seen. What a task you had!".

### LAWNSEED LABELING

The "Fall" issue of the Massachusetts Turf Bulletin carried a story by Dr. Rice, University of Massachusetts asking whether changes are not needed in lawnseed labeling? The item is of interest more as a reflection of changing attitudes than for imparting vital information. Rice opens by comparing how deficient is knowledge about individual grass varieties to purchasers of lawnseed, compared to farmers who purchase crop seed. He implies that more information should be made available concerning a variety's fertilizer and moisture requirements, response to pesticides, etc., etc. He exhibits "labels" contrasting present requirements with proposed new ones that do not require "fine textured" and "coarse kind" categories. He doubts that many states will be anxious to give up the "fine textured" distinction.

Rice favors better identification of troublesome seeds, crop as well as noxious. He suggests that there soon may be a new concept of what is "noxious" in lawnseed, following adoption by the Association of Seed Control Officials of the Northeastern States of the following list (all of which would be considered "noxious" if contained in a lawnseed mixture): *Agrostis*, *Allium*, *Bromus*, bermudagrass, Canada thistle, foxtail, Junegrass, meadow fescue, meadow foxtail, orchardgrass, *Poa annua*, *Poa trivialis*, quackgrass, tall fescue, timothy, and velvetgrass. Rice feels that new rules and regulations will be forthcoming, that better enable a purchaser to judge the real quality of lawngrass seed by scanning the label.

### STORY IN METRO LAWN AND GARDEN SECTION

We recently received copy from Metro Newspaper Service, of their Lawn and Garden section that goes to more than 4,000 daily and weekly newspapers across the United States and Canada in the Metro Communications Network. A story had been prepared for the "section" last spring, and appeared along with an Institute photograph and mention of the Lawn Institute in the text. A portion of the text reads, "Many of the new lawngrass varieties are bred for an extended growing season - - -." Fine fescues, bluegrasses, bentgrasses, perennial ryegrass are then mentioned.

The Institute's item was accepted at no cost. Commercial interests are charged \$24 per column inch. Scotts appears to be the only lawnseed firm subscribing, although Burpee, Toro (lawnmowers) Dow, Ortho, and various fertilizer interests are represented. A number of stories deal with landscaping, swimming pools, sprayers, chain saws, equipment, terrariums, planters, pest traps, - even grooming aids (Gillette).

### REPRINTS AT WORK

Typical of the uses to which Institute reprints are put, is this request from the "office of the principal", Romeo, Michigan, high school: "I teach a high school 'Plants & Soils' class. Much of our time is spent on lawns and gardens. I have 50 students. Please send any pamphlets you think would help us. We will pay postage".



## OHIO SEED DEALERS ANNUAL MEETING

Dr. Schery was banquet speaker at the annual meeting of the Ohio Seed Dealers Association, November 8, Columbus, Ohio. The day-long program included presentations on seed cleaning, lawns in Europe, activities of the Association, review of trends by the Director of Agriculture, a review of garden seed production (Northrup King) and laboratory seed testing (by Dale Kern of Seed Technology). Of particular interest was Harold Doellinger's (Scotts) presentation "Lawns - Programs and Problems in Central Europe".

Doellinger, now back from a lengthy stay that chiefly involved West Germany and Switzerland, is pessimistic about the European situation and its "creeping socialism". He feels that racially related troubles lie ahead, now that unemployment is increasing while "cheap labor" from the Mediterranean countries is "taking jobs" from the local populations.

Doellinger pointed out that the idea of lawns in this part of Europe is relatively recent, and because of dense populations (and expensive land) tend to be quite small (perhaps averaging about 800 sq. ft.). Seed was traditionally bought from "mom and pop" stores, hand dipped from bins, but in recent years there has been a trend to garden stores in shopping centers much as in the USA. This has become resented, and the government is now putting restrictions on shopping centers to protect the individual, small retailers.

Doellinger points out that many of the outstanding American varieties do less well in the milder European climate than in the USA, Manhattan and Pennfine ryegrasses being case in point. There is no crabgrass in Germany, so little market for chemical preventers. Because of the milder climate, lawns remain green all winter, the weather paralleling that of Oregon more closely than any other part of the United States (Scott varieties for Europe are thoroughly tested in Oregon before being committed to sale there). As has been well recognized, the Europeans like a light green color (to better mask *Poa annua*, prevalent throughout Europe), in contrast to America's desire for a dark green color.

Most breeding is by private firms and the cultivars resulting must be tested several years at the University needing approval there before being permitted on the restricted sales list. Because of the high quality of American seed, about 1/3 qualifying cultivars come from the USA, even though European production (as in Denmark) is considerably more economical. In Europe collusive pricing is not frowned upon as in the United States, so that lawnseed selling is regulated rather than operating as a free market.

Throughout Europe there is much less freedom than in the United States; even moving from one canton in Switzerland to another requires getting permission to leave the first and enter the second. Costs are quite high (\$5 per pound for coffee, taxes on t.v. or radio usage, etc., etc.). Throughout Germany now, large corporations must have labor representation on the board, with veto power over management. Recently inflation and costs have mounted so outrageously in Europe, that the United States has rapidly gained price advantages.

## INTERNATIONAL TURFGRASS PROGRAM

Dr. Schery has been informed by Prof. Boeker, Chairman of the Third International Turfgrass Research Conference, that the Institute paper "Evolution of Lawn Cultivars In America" has been accepted for presentation and publication in the proceedings.



#### INSTITUTE TO BE LISTED

The Institute has received notice from the American Horticultural Society that it will be listed in the forthcoming Directory of American Horticulture. We are pleased to appear in this illustrious directory.

#### INTERNATIONAL TURFGRASS CONFERENCE PROCEEDINGS

The American Society of Agronomy had undertaken publication of the Proceedings of the first and second International Turfgrass Conferences, but because of a considerable financial loss had turned down invitation for publishing the Proceedings of the third, to be held in Munich, July of 1977. The International Turfgrass Society countered with a proposal to contribute \$7000 towards defrayment of this project, whereupon ASA reconsidered. It is now agreed that American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America would collectively contribute 2/3 of the cost of publication, with ITS contributing the remaining 1/3. Thus it now appears that papers presented at the third conference will be published, as in the past. Dr. Schery has scheduled "Evolution of Lawn Cultivars in America", as a presentation in behalf of the Institute at the Munich meetings.

#### HORTUS THIRD ANNOUNCED

MacMillan Publishing Co. is initiating sales of HORTUS THIRD, the standard reference for cultivated plants of the United States and Canada, prepared from two decades of endeavor by the staff of Bailey Hortorium of Cornell University. Dr. Schery was asked to contribute the section having to do with lawns, giving an extensive review of lawngrasses and their care in a modern context.

#### CIBA-GEIGY SERIES

An extremely attractive series called "Weed Tables" has been prepared for CIBA-GEIGY, that includes exquisite color plates of various species, and elaborate tabular descriptions for identification. It is a work of art, requiring the talents of highly trained botanists. The series received at the Institute covered genera 81-127, embracing the mint and nightshade, figwort, broom-rape, madder, valerian, teasel, blue-bell, and composite families.

#### CULTIVAR STORY

The October Weeds, Trees and Turf magazine carried the Institute's story, "Curious About Cultivars", which has been reprinted and distributed to members, as well as serving for Press Kit inclusion and response to inquiry. The story has been well received, even though it is impossible to include even a fair proportion of ratings in the tabular space available for magazine presentation. The short discussion of the individual cultivars represented by the Variety Review Board listing provides condensed information about the selections.

#### CHANGING TIMES' PLANS

A call from Margery Crane, Changing Times Magazine, indicates that a review of Lawn Keeping and an in-house story by her, based upon background material supplied from the Institute, will definitely appear in the late Winter issue of Changing Times Magazine. Additional background material is being supplied Ms. Crane.



## FOR THE GOLF COURSE WORLD

A story entitled "How Stands Your Grass" (title courtesy of editor Eldon Miller) appeared in the November issue of Club Management magazine. The magazine audience consists chiefly of golf course managers, who are made aware of the advantages of new grass cultivars by appearance of stories such as this.

## OHIO TURFGRASS CONFERENCE

The 1976 Ohio Turfgrass Conference and Show was held December 7-9, in Columbus, Ohio. It was very well attended, with abundant commercial representation including several Institute member firms.

The opening session began with several presentation of the "greetings" sort, and two golf course experiences. Dale Kern, Seed Technology, wound up the session talking about "New Developments in Testing Programs for Seed Quality".

The second-day divided into Golf Course and General Grounds sessions, some of the speakers alternating between both. In the general sessions Dr. Martin, Ohio State, dealt with thatch decomposition, and reported no significant differences where purported thatch decomposing materials had been applied. Other than topdressing (difficult for a home lawn), best means for thinning thatch was "grooving" (thinning with a vertical mower).

Houston Couch, Virginia, dwelled upon Fusarium Blight. He acknowledges that all cool-season grasses can suffer from F. tricinctum and F. roseum; but of these diseases isolates can be found that are saprophytic and passive (causing little damage or spread of disease), and others which are highly aggressive and parasitic. Variability is great; some are active at low temperature, others at high; some rot the grass crowns (after which it will not recover), others bother only foliage. Couch was emphatic that the disease is not caused by nematodes (the Michigan State position).

Couch noted that benomyl has sometimes not given control of the disease, but it does upset the soil ecology (eliminates earthworms, for example). He noted the similarity in appearance of various diseases, and stated that laboratory identification under the microscope was essential to be certain. As a rule Fusarium has a reddish margin with a pink mycelium on the crown where rotting may be taking place. Couch thinks that high fertility and heavy thatch encourage Fusarium, which he terms a "rich man's disease", the "gout" of turfgrass.

Light watering seems to help hold down Fusarium, and systemic fungicides have proven useful (but resistant strains of the disease are building up). A clue as to when Fusarium will become virulent is when night temperatures are high (two or three days above 70° F), a clue for immediate spraying. Six to eight oz/M. is the top rate of systemic fungicide that should be used, to avoid phytotoxicity.

Richard Miller, Ohio State, reviewed the increasing incidence of bluegrass billbug in Ohio. This year collections in April gave all males, but in May females showed up with egg laying in late May: by June 7 adults were found on sidewalks, larvae in lawn: by late June there were many larvae but not yet imbedded in stems (so could be killed by spraying). Miller suggests April-May sprays for adults, early summer sprays for grubs.

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## OHIO TURFGRASS CONFERENCE - Continued

Tom Evans, Welsicol, spoke about the difficulty of countering EPA utterances, even when incorrect or questionable. The general press plays up government actions when they are taken, scarcely mentions rebuttal by pesticide producers. Nick Christians, Ohio State, reviewed lawnseed size variations, a repeat of his presentation to the agronomy meetings (reviewed elsewhere in this issue of harvests). Paul Henderlong, Ohio State reviewed the reasons behind late autumn and winter nitrogen fertilization.

The afternoon sessions were given over to professional lawn services. Don Waddington, Penn State spoke about nitrogen sources. Robert Miller, Chem-Lawn, spoke about compatibility of materials in tank mixes. Other presentations had to do with monitoring toxicity, landscaping problems (William Davis, California), lawn services using dry rather than liquid materials, and use of surfactants to improve penetration of pesticides.

The final day was oriented to pesticide application training, with general resumes on insect identification and control, disease identification and control, and weed control. Ohio State faculty members reviewed the pesticide laws and regulations, safety factors, and proper use of equipment. Several hundred people attended these sessions, indicative of the high interest in applicators who were to take their tests for certification by the afternoon.

### REPRINTS FOR TEACHING

Dr. Duff, University of Rhode Island, requested 70 copies of the reprint "Curious About Cultivars" for classroom use in his teaching program at the University.

### COOPERATION WITH NATIONAL ASSOCIATION OF REALTORS

We have this reaction from Dennis Brown, of the National News Media Relations, Chicago: "Thank you for your prompt response - - -. The reprints you sent are perfectly suited to my needs - - -. Lawn Care is a subject of great interest to homeowners. I would like to provide timely and accurate information on the subject - - -. I will gladly gear my column to the appropriate time of year - - -. It appears that the Institute will have an additional outlet for its informational releases through Mr. Brown.

### BACKGROUND MATERIAL SENT

Al Radko, USGA Green Section, telephoned asking for Institute background material for a portion of his presentation to the Agronomy Society Annual Meeting in Houston. His presentation concerns educational programs, especially those of a specialized nature going beyond the extension service. Radko states: "National agencies will have to gear to provide more and more direct services to their members if they expect to continue to thrive."

### DR. SCHERY REAPPOINTED

Incoming President, Dale N. Moss, has reappointed Dr. Schery as liaison representative with the Institute of Ecology (TIE), for the period 1976-1979. Such society activities enhance the Institute's image in the professional field.



## THEORETICAL SECTION

### AGRONOMY MEETINGS 1976

Thirty Seven papers were entered for presentation before the Turfgrass Division of the Agronomy Society, at the 1976 annual meeting. Not all will be of interest to members, but a resume grouping papers according to general orientation may be of interest.

General - Beard, Texas, looks towards the future, and suggests new research approaches to meet the changing American life style. He queried all states (replies from most) as to man-years invested in turfgrass research (Virginia lead the nation at about 5 1/2, partly because of Highway Department sponsorship, and partly because of more exhaustive assessments of "research" time by the Virginia respondent).

Kilsheimer, Scotts, foresees restrictions due to limited energy supplies, which calls for: less expensive seed; grasses bred for lower maintenance; better growth regulants, fungicides and insecticides; and more selective herbicides for taking one perennial grass out of another. He feels environmental considerations will weigh heavily, and that more efficient fertilizer nutrient usage is especially needed.

Grass Cultivars - Not a great deal of attention was given individual cultivar response, although Callahan, Tennessee, evaluated 16 creeping bentgrasses of which Penncross and Arlington C-1 were among the top 5 (ARC-1 led). Ohio State research compared seed size in various cultivars, and noted a range from almost 2 million seeds per kg. for Birka to more than 4 1/2 million seeds per kg. for Merion. Texas A & M research investigated grass performance under low light intensity, with inconclusive results except that the two shade tolerant bluegrasses (Nugget and A-34) both seem to accumulate food reserves more in stem tissue than in leaf tissue, possibly of some significance.

Fertilization - Research at Southern Illinois (Carbondale) noted the advantage of November fertilization for Kentucky bluegrass as compared to December-March applications. In Nebraska different nitrogen carriers were judged, with IBDU and coated materials rating well, better than UF, Milorganite and SCU (at a lower dissolution rate). In Florida overseeded ryegrass was not significantly affected by fertilization variables except when plots receiving nitrogen every week received no phosphorus, potassium or magnesium; differing interrelationships could be found, but seemed not to have material influence. Also in Florida, fertilization through the irrigation system provided slightly more consistent ratings than separate fertilization, and is heralded as a "coming thing".

Thatch - University of Illinois investigations showed thatch to be superior to the soil beneath it in many values by which soils are judged. But where the soil had been treated with calcium arsenate, a number of physical qualities deteriorated, probably at least in part because earthworm activity was eliminated. In Arizona cation exchange values increased as thatch accumulated through the years, and was greater for bermudagrass than for bentgrass; sufficient organic nitrogen occurs in thatch to provide turf nitrogen requirements for two to three months. Nitrogen mineralization in the thatch greatly affected distribution of available nitrogen and root development during heat stress.

Breeding - Investigations at Beltsville focused on the need for developing new cultivars suited to low pH, where exchangeable aluminum becomes toxic. Present cultivars differ greatly with respect to aluminum toxicity. Powell, Beltsville,

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AGRONOMY MEETINGS 1976 - Continued

(Breeding - con't)- cited the newer techniques available for creating genetic variation, and for better screening of selections tailored for specific environments.

Herbicides - Texas A & M research confirmed usefulness of gibberellic acid for maintaining color in certain "chilled" bermudagrass cultivars, especially Pee Dee. Johnson, Georgia, found napropamide to be quite effective in controlling spurweed in bermudagrass. Spurweed (Soliva) is an increasingly serious winter weed in southern turfs.

Penn State experienced excellent success using glyphosate for turfgrass renovation, especially elimination of mature stands of bentgrass and tall fescue, or replanting in bluegrass and perennial ryegrass. Even a slight rain soon after spraying nullified glyphosate activity. In North Carolina tricalcium arsenate was deleterious to bermudagrasses, common more so than the hybrid varieties. At Penn State growth regulators were only moderately successful in controlling *Poa annua* (as a weed in other turf), and generally caused winter discoloration of the desirable turf; an autumn application followed by overseeding gave best results.

Soil - In Virginia soil mixed equally with sand gave somewhat better results with creeping bentgrass than did a 90% sand mix. At Texas A & M it was found that sand particle shape made considerable difference, and that fine sand of uniform texture gave best results. At the University of Massachusetts soil conditioners had some influence, although the grass responses were generally minor. At Ohio State it was concluded that "dry spots" on sand greens resulted from a water-repellent coating on the sand presumably secreted by fungi.

Physiology - At Cornell University Merion and Nugget bluegrasses grew best at about 78° F, with Nugget showing greater heat tolerance (at around 100°F). It was concluded that shoot growth cessation at high temperature is under control of a process in the roots, and may be offset in part if the soil remains fairly cool. In Arizona heat markedly influenced root decline of creeping bentgrass (up to 80% loss), apparently more so with established sod than newly seeded turf. Higher nitrogen fertilization intensified root decline, although not so importantly as heat.

In North Carolina bermudagrass rooting was reduced by high nitrogen levels, as was winter hardiness. Earlier seedings were more tolerant of cold than later plantings. At Texas A & M improved metal halide lighting was recommended for more consistent growth chamber results than conventional fluorescent types give.

At Penn State individual tillers of Merion bluegrass showed injury at about 113° F. and complete kill at about 118° F. In California several grasses were exposed sporadically to ozone (as in smog), which set back both clipped and unclipped meadow fescue and Kentucky bluegrass, but only the clipped plants of tall fescue. Manhattan ryegrass exhibited toxicity symptoms, but dry matter production and tillering were not reduced.

Miscellaneous - Burns, Georgia, showed that bermudagrass sod could be successfully grown on sludge. Deal, Maryland, surveyed agricultural administrators, who on the whole see a bright future for turfgrass programs. Huffine, Oklahoma, reviewed the

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## AGRONOMY MEETINGS 1976 - Continued

(Miscellaneous - con't)- origin of the turfgrass custom. Radko, New Jersey, noted the need for increased advisory services in the turfgrass field. Georgia researchers acknowledge a greatly varying tiller count with roadside bahiagrass, depending upon season. Illinois research showed turfgrass clippings to be a valuable protein nutrient for animals. Vermont specialists commented on an excellent new slide set developed for identification of individual turfgrass species (one of the series meant for sale by the Society, e.g. Morgan committee).

## SPECIES AND CULTIVARS RATED IN CALIFORNIA

An exhaustive series of scorings made in California by six specialists from the University in all parts of the state, are summarized in the "Fall 1976" issue of California Turfgrass Culture.

In the state as a whole Kentucky bluegrass ranked slightly better than perennial ryegrass, which in turn was slightly better than colonial bentgrass and appreciably better than red fescue. Surprisingly, Kentucky bluegrass was significantly better in the warm season than in the cool (perennial ryegrass was about the same both seasons, colonial bentgrass and red fescue poorer in warm weather than in cool). Considering only the cool season, Kentucky bluegrass rated a shade lower than either perennial ryegrass or colonial bentgrass; it was its exceptional performance in warm weather that caused bluegrass to rank well ahead in "average ratings."

On the whole differences were not great between bluegrass cultivars, nor between coastal and inland locations. Very closely grouped in statewide average were: Victa, Fylking, A-34, Baron, Primo, Sodco, Cougar, Pennstar, and Windsor. There was then a moderate falling off to Nugget, Merion, and various "common" types.

With the perennial ryegrasses Pennfine lead, followed by Manhattan, Lamora, NK-200, all distinctly better than common. Nor was there a great deal of difference between fescue cultivars, the limited comparisons showing Golfrood slightly ahead of Jamestown, Illahee, Pennlawn and Ruby, with Highlight and Wintergreen a step less adequate. Holfior lead Highland and Astoria bentgrasses very slightly, with Exeter last in the four cultivar race.

The results of these ratings can be viewed to support the conventional usage of perennial ryegrass in the cooler coastal locations, with more emphasis being put upon bluegrasses or bluegrass mixtures in the coastal valleys some distance from the ocean.

## ESTABLISHING CENTIPEDEGRASS

Johnson, Georgia, reports in the Nov.-Dec. 1976 Agronomy Journal, on various herbicidal treatments to restrain weeds when sprigging centipede grass. If initial weed competition is reduced, centipede prospers greatly and is able to compete with later weed growth. Single applications of DCPA, atrazine, simazine, and oxadiazon did not injure centipede grass significantly. Repeated herbicidal treatment usually restrained weeds more, but did not result in better centipede coverage at the end of the season. Repeat treatments of herbicides could prove injurious to the centipede grass.



#### PENN STATE TURFGRASS PROGRAM

Dr. Schery spent October 7 with Dr. Duich, visiting the Penn State turfgrass research grounds. Dr. Duich's activities have centered this year on remaking much of the test area to assure uniform comparative conditions, installing automatic irrigation apparatus. Breeding work has centered on bentgrasses, of which several excellent selections have been made (including a rhizoming type, which, unfortunately, does not carry over this recessive characteristic in seed). One new bentgrass with certain advantages over Penncross is ready for release. Penncross is on a 4 year certification schedule, and Duich is concerned that other Penn State public varieties (particularly Pennlawn fescue) are not being maintained up to foundation seed standards in the production fields in Oregon. He has made side-by-side plantings of Pennlawn fescue from various sources, a number of which are quite inferior to standard Pennlawn. He has come to the conclusion that the future lies not in public varieties, but in exclusive releases which can be better policed.

Duich is searching for a reasonably light colored bentgrass (to better camouflage *Poa annua*), of moderate vigor (not requiring such intensive management as Penncross), with an upright growth habit. He is not worrying overly much about familiar diseases such as dollarspot (quite prevalent on the grounds at time of visit), since these are rather routinely controlled with fungicides such as daconil, dyrene and a new Rhodia product.

At time of visit all the regional bluegrasses looked very much alike, and it was even difficult to distinguish Merion (used for borders) from the vigorously growing grass at this time of year. One of the chief problems with bluegrass is the spot invasion with bentgrass colonies (also velvetgrass), prevalent in the high elevation climate of Penn State. Duich forced ryegrass growth this summer with heavy fertilization in order to encourage disease and better earmark differences between varieties. Most cultivars had a brown undercast at time of visit, Citation being one of the better performers. Under this type of management the perennial ryegrasses are not the equal of the bluegrasses. Duich notes that a "new" major problem with bluegrass from Penn State eastwards is *Fusarium*, which is not of so much consequence in the rest of the country. It appears that breeding programs should take into consideration regional emphasis.

#### RUTGERS TURFBREEDING PROGRAM

Dr. Schery spent October 5 with Dr. Reed Funk and his colleagues at Rutgers University, with a visit to the Adelpia substation about 25 miles from New Brunswick. Here are some of the highlights: Dr. Funk's turfgrass breeding program, the most extensive in the United States, is most impressive if for nothing more than the sheer volume of select cultivars that have been released and are continuing to be produced. The granting of exclusive rights to a cultivar for a royalty has worked out well, and has aided departmental income sufficiently so that necessary help can be secured to maintain this massive program.

Dr. Funk realizes that sufficient improved turfgrasses are now available essentially to provide a good quality proprietary cultivar for anyone interested. Funk speculates what turn his breeding program should take at this juncture, since a significant breakthrough with a new cultivar would be needed to interest proprietors in utilizing

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## RUTGERS TURFBREEDING PROGRAM - Continued

it instead of present cultivars in which they have already invested. Obviously there will be some attrition, as present cultivars become susceptible to newly evolved races of disease (or other problems), and through competition in the market place (particularly relating to seed yields).

Dr. Funk acknowledges that his releases have mostly been screened under rather high fertility conditions, and that the tenor of the times calls for a lesser fertility regimen. High fertility has been maintained as an encouragement to disease, thereby making selection against leafspot and suchlike more "visible". It was also suggested that perhaps perennial ryegrass from steppe climates might be used to introduce greater hardiness into perennial ryegrass releases.

Dr. Funk is actively pursuing collection of bluegrass germplasm from southern locations, looking towards better cultivars for the southern extremes of the bluegrass belt. Bill Dickson, working with Funk, has screened out a useful Poa trivialis (Sabre) which should be useful for southern golf green overseeding. Like other breeders, Funk has sorted out a good many fine textured tall fescues by recurrent selection, which may have heat tolerance in the transition zone that fine fescues and bluegrasses lack. At Rutgers the Michigan State meadow fescue suffers more brownpatch disease than is desirable for a low-maintenance turfgrass.

Funk does not find tall fescue the pest in New Jersey that we run into in the Midwest. He indicates that low (3/4 inch) mowing will gradually eliminate the tall fescue, especially in competition with ryegrasses. Ryegrasses are better colored and quicker to fill in the New Jersey climate, leaving little need for a tall fescue there.

A graduate student, Bangalor, from India, is studying means for breaking dormancy of bluegrass and other turfgrasses, for quicker germination. Combinations of gibberellin, ethrel and other hormones, which could be sprayed onto seed in an acetone solvent rather inexpensively, has caused bluegrass to sprout much more adequately than it would otherwise at high temperatures.

### UPDATE ON UF

We were most pleased to receive from John Hayes, Hercules, two excellent reports, "Long-Term Evaluation of Slow-Release Nitrogen Sources on Turfgrass", by a group of Penn State researchers; and Hayes' own presentation before the American Chemical Society, "Release of Nitrogen from Ureaforms".

The Penn State report, appearing in the July-August, vol. 40, no. 4, Soil Science Society of America Journal, is especially interesting in that it embraces observations over a seven year period. Over that span it compares urea, UF, IBDU, a urea-paraffin combination, plastic coated urea, Milorganite, and two formulated complete fertilizers. The urea was applied each second week, the other materials at more remote intervals, the total nitrogen of each being equivalent on an annual basis. Some of the slow-release sources are notably "inefficient" in the early going, but build up reserves in the soil of considerable benefit later. The authors conclude, "At the end of the 7-year period, determinations of yield, color, and total soil nitrogen indicated that [UF] had the greatest residual effect."

The Hayes report is unusually lucid and comprehensive, providing an excellent summarization of the behavior of nitrogen sources used for turf. Hayes notes the dependence

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## UPDATE ON UF - Continued

of coated fertilizers upon dissolution mechanisms, IBDU upon hydrolysis, and UF upon biological degradation. Each has its advantages, but biological degradation most nearly matches plant growth needs, both being maximized by the same conditions. Biological decomposition proceeds in two steps, ammonification and nitrification. Ammonification is usually the "bottle-neck" (nitrifying organism generally being ample), but it is not very sensitive to pH and temperature (while nitrification is). UF has proven to be completely biodegradable when properly selected microorganisms are involved. When nitrification is not sufficiently rapid to "consume" all of the ammonia from ammonification, plants are generally able to utilize the ammonia nitrogen nonetheless (as is proven by tree response to UF fertilization on very acid southeastern soils).

### POTPOURRI FROM THE AGRONOMY MEETINGS

Search continues for dryland grasses, useful for unirrigated golf course roughs in the plains. The Air Force has come up with crested wheatgrass, buffalograss, bluegrama, western wheatgrass, saltgrass (*Distichlis*) and smooth brome, all able to survive on less than 15 inches annual rainfall. A mixture of western wheatgrass and buffalograss seems to have gained favor.

Two small watersheds in Michigan were studied to determine fertility loss. Results support findings reported previously in Harvests, that very little nutrient loss occurs in surface runoff (not over 3% nitrogen, 0.3% phosphorus). Most losses were due to erosion (sediment).

In Washington, Canode and Law investigated bluegrass seed production field burning further. About half as much thatch remained where burning was practiced, as where mechanical removal of straw was undertaken. Increased seed production seems directly related to thatch, and thus to field burning. Thatch apparently stifles robust tiller regrowth in autumn.

Research continues on attempts to inoculate grasses with nitrogen-fixing bacteria (*Spirillum lipoferum*), at the University of Florida. Success has been achieved with buffelgrass (*Cenchrus ciliaris*), with the nitrogen-fixing organism observed both in the rhizosphere and the outer root tissues.

Studies have also been undertaken at the University of Florida to determine salt tolerance of Pensacola bahiagrass. About 400 ppm sodium chloride proved the breaking point so far as survival was concerned, but salt concentrations greater than 200 ppm reduced growth, and levels above 100 ppm resulted in eventual decline, (which for practical purposes would represent the upper level of salt tolerance for bahiagrass).

Crop residues, in Washington, suppressed wheat root growth. An extract from bluegrass straw was the least toxic in autumn, but most toxic in the spring (causing a 50% wheat root inhibition in April). The authors suggest keeping straw of any kind away from the seed row in order to minimize toxicity.

### BIOLOGICAL DETHATCHING MATERIALS

The Fall 1976 issue of California Turfgrass Culture reports that biological dethatching materials tested (including Bio-dethatch and Thatch Away) were not influential in reducing thatch, paralleling findings reported in the eastern part of the country and at the Lawn Institute.



## TECHNICAL SECTION

### LAWNSEED SIZE COMPARISONS

Nick Christians, Ohio State University spoke on "Seed Size Variations of Kentucky Bluegrass and Fine Fescue Cultivars", at the American Society of Agronomy meetings in early December. At the Ohio Turfgrass Conference in Columbus he kindly provided the Institute with copies of pertinent data from his research.

Seed counts were determined by two methods, - counting the seeds per unit weight, and determining the weight of 100 individual seeds. The results paralleled quite well. Having most seeds per unit weight was Merion (4667 expressed as seeds/g), ranging down to Birka with the fewest (1867 seeds/g). In between (from more abundant to less abundant) were: Windsor, Brunswick, Vantage, A-34, Sydsport, Delta, Adelphi, Galaxy, Parade, Majestic, Park, Glade, Cheri, Victa, Baron, Fylking, Nugget, Aquila and Pennstar.

Of the cultivars tested only Merion averaged more than two million seeds to the pound; Fylking, Nugget, Aquila, Pennstar and Birka all ran less than a million. Obviously, when seeded according to a poundage rate, Merion would be about twice as abundant as Pennstar or Birka.

Test plantings were made at usual poundage rates (thus reflecting the deviations noted for seeds per unit area), and the same seed was planted according to seed count. As might be expected, the more abundant the seed the greater the initial impression of coverage (autumn), difference tending to disappear by the following spring with cultivars such as Merion having a more abundant seed count when based on weight. The difference was still significant with cultivars such as Nugget and Pennstar having the lesser number of seeds per unit weight. The quality of the plantings also rated more highly where the seed was more abundant.

The research recognizes that considerable variation may occur within a single cultivar, comparing one lot of seed with another. Differences of around 20% were found with Merion, Fylking and Pennstar, and no set of comparisons was without at least 3 or 4% discrepancy.

Strength of the sod resulting from the various seedings showed no significant difference between cultivars, nor consistently with the heavier seeding rate (compared to the lighter resulting from large-seeded cultivars).

The same trends occurred with fine fescue cultivars as were noted with bluegrass. Erica was the smallest seeded cultivar tested (at 1272 seeds/g), followed by Scaldis, Centurian, Sonnet, Z-26, Menuet, Bolero, Banner, Dawson, Koket, Jade, Highlight, Atlanta, Wintergreen, Jamestown, Polar, Durlawn, Mariet, Pennlawn, Novarubra, Encoda, Fortress, Patio, Golfrood, and Boreal (620 seeds/g).

When seed mixtures were formulated according to poundage (utilizing extreme seed sizes as examples), the discrepancies were marked. Using a 25% bluegrass-75% fine fescue combination, seed numbers would be close to equal with Merion-Erica, but almost 3 to 1 with Merion-Boreal; Birka-Erica would result in a 1 to 2 bluegrass-fescue ratio, but Birka and Boreal would be 1 to 1.



#### MORE ON SLOW-RELEASE FERTILIZATION

Waddington and Duich, Penn State, report in the September-October Agronomy Journal, on "Evaluation of Slow-Release Nitrogen Fertilizers on Pennpar Creeping Bentgrass". A single annual application (spring) of the slow-release material at about 6 lbs. of N/M was compared with multiple applications of urea totalling the same amount of nitrogen. The authors make several observations, but refrain from deciding what is "best" (the comparisons involved plastic-coated soluble fertilizer, SCU, IBDU, and UF). Clipping weights and color were the criteria utilized; obviously there is no advantage to increased clippings unless this portends improved quality (which seems not necessarily to have been the case here). The authors found greatest initial response with IBDU. Yields from all slow-release sources equalled or exceeded the urea treatments for about 14 weeks, whereafter the situation reversed. Performance of the coated fertilizers was intermediate between IBDU and UF. None was considered satisfactory from a single application annually, although two applications would provide acceptable quality. IBDU, which produced greatest growth during the first eight weeks, had the poorest color in autumn. Residual carry-over from autumn to spring was best with urea, poorest with IBDU. Nitrogen uptake during the "control-release period" decreased faster with IBDU than with either UF or SCU. Although total yield with UF was lower than with the other treatments, its consistency (limitation of growth peaks) was better.

#### DISTINGUISHING FINE FESCUE CULTIVARS

A report by Nittler and Kenny, Cornell, in the September-October Agronomy Journal described investigations for distinguishing cultivars of fine fescue. Chewings fescue cultivars such as Cascade, Highlight and Jamestown developed long, narrow leaf blades when treated with ethephon, while other cultivars (cf. Rainier, most seedlings of Ruby, and various proportions of Arctared, Illahee and Pennlawn) develop short, wide leaves. The technique doesn't serve to identify a particular cultivar, but would show up faulty claims if the particular cultivars were of one type and the test showed seedlings with the opposite characteristics.

#### SUCCESS WITH OXADIAZON

Research by Johnson, Georgia, on pre-emergence weed controls with bermudagrass and Kentucky bluegrass, is reported in the September-October Agronomy Journal. No single herbicide controlled all weed species satisfactorily, but oxadiazon was superior to present commercial and other experimental crabgrass preventers for keeping crabgrass out of either bermudagrass or bluegrass turf, and doing quite well in eliminating winter weeds in dormant bermudagrass (especially Alchemilla, and about as good as pronamide for annual bluegrass). Johnson is quite enthusiastic about oxadiazon for weed control in the Southeast, and butralin for several weed species, both of which he considers superior to the presently available range of commercial herbicides.

#### OKLAHOMA RESEARCH PROGRESS

During the quarter we were pleased to receive the 1975-76 "Turfgrass Production and Management Research Progress Report", from the Department of Agronomy, Oklahoma Agricultural Experiment Station. Most of the items were quite epitomized, and there is some difficulty in identification of coded materials (especially with herbicides). In weed control several reasonably effective compounds have been

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OKLAHOMA RESEARCH PROGRESS - Continued

found for stopping crabgrass, goosegrass and *Poa annua*.

Perhaps of more interest than herbicides would be results from seeding different northern turfgrass varieties, under the rather stringent Oklahoma conditions. Surprisingly good results were obtained with some of the newer bluegrasses, and Wayne Huffine writes, "We are quite delighted with the results we are observing, particularly with the varieties Baron and Victa as well as Adelphi and Bonnieblue. It appears as though with these new varieties we are able to hold them quite well through the summer months and, therefore, will afford our people additional choices in the selection of grasses for their homelawn."

In a comparison of seeding rates with tall fescue, no advantages in density were found for rates higher than 4 lbs/M. Best density was obtained with Kentucky 31 and Kenwell varieties. No significant differences were noticed in density of bluegrass varieties, although there were decided preferences in color (Baron and Victa led, followed by Adelphi and Bonnieblue, with Nugget not far behind). The perennial ryegrasses fared much less well than did the bluegrasses, but the results would certainly seem to be somewhat confused by the high ryegrass seeding rate (44 lbs/M compared to 1 1/2 lbs for the bluegrasses). This was in a test for "shaded lawns", where, of the commercial varieties, Merion led the ratings for both density and color. Good results were also obtained with a French orchardgrass.

Good control of *Poa annua* in dormant bermudagrass was obtained with formulations of Probe (methazole) and Kerb (pronamide). Trimec failed to give good control of henbit and dandelion in a winter treatment, being more effective when the same amount of chemical was used in a limited quantity of water than in higher gallonages. Two quarts of Trimec in 40 gallons (the most concentrated rate in the test) gave best results, suggesting that an even stronger solution would be better for winter weed control.

"TURF ANNUAL" PUBLISHED

The August issue of Park Maintenance contained a somewhat changed "Turf Research and Irrigation Annual", with several contributors rather than a single invitational editor.

Dr. Daniel, Purdue, spoke for the Midwest. He dealt chiefly with research that has been previously reported in Harvests. About half of his coverage dealt with new turfgrass varieties, and he offered three tables about bluegrasses, successively: "Some Turf-Types", "Common Types" and "Some Varieties Being Phased Out". Among the latter he lists Arboretum, Fylking, Merion, and Windsor, as well as Pennstar and Sodco (concerning which this is truly the case).

Other comments concern a more careful look at fertilization requirements (because of higher costs), the fertility value of sulphur (especially iron sulphate), and new eruptions of disease (primarily because of restrictions on fungicides, especially mercurials).

Dr. Gibeault speaks for the West. Here again most of the research reported has been reviewed in earlier Harvests. Near San Diego a coded creeping bentgrass (UCR-13) rated first, with Emerald second (ahead of Penncross and Seaside). glyphosate and galapon were successfully used in Arizona for conquering common bermudagrass before sodding select varieties. Sodding in October resulted in good



"TURF ANNUAL" PUBLISHED - Continued

initial rooting, but no further root activity was noted from November through February.

Goss's studies in Washington, showing the value of sulphur, are mentioned, and it is noted that the benzimidazoles seem to be losing effectiveness for control of snowmold. The importance of soil temperature for performance of Kentucky bluegrass in California is recognized, and a number of varieties are rated for susceptibility to smog (ozone and PAN; Newport and Fylking were but slightly affected by both constituents, while Baron, Merion and Glade were highly affected by at least one).

Another table summarizes 1973 results on variety performance, without a lot of difference between prominent bluegrasses (Fylking and Victa led, followed closely by A-34, Baron, Primo and Sodco). Pennfine and Manhattan were the leading ryegrasses, Golfrood and Jamestown the leading fine fescues.

Murray, Beltsville, was spokesman for the South (including the lower East). Much of his report was derived from the Southern Turfgrass Workers Group meeting in Arkansas in June.

After a 4 year study, there is encouragement that Kentucky bluegrass varieties suited to the upper South can be had. High ranking were Baron, Victa, Adelphi, Vantage, Bonnieblue, Majestic, Pennstar, Windsor and combinations including one of these. Kentucky 31 tall fescue, of course, has always been highly serviceable in the upper South. Midiron bermudagrass continues to show excellent resistance to spring dead spot, a hazard in the transition zone. Floratam st. augustine-grass continues to prove outstanding in the deep South.

Glyphosate is extolled for turf renovation and for control of winter weeds. Glyphosate in combination with a pre-emergence "crabgrass preventer" helps to obtain better bermudagrass cover. Other, more involved studies, as those by Johnson in Georgia that have been reported elsewhere in Harvests, are reviewed. A table showing sod damage to Tifgreen bermudagrass in Tennessee indicates little or no trouble from the general run of pre-emergence herbicides on the market, while another table reviewing a shade study in Tennessee shows generally better quality of turf from zoysia than from any of the northern grasses or bermudagrass (the northern grasses were particularly hard hit with disease).

Research in Florida has shown the usefulness of gibberellic acid for maintaining greenness of bermudagrass during cold snaps. In Georgia fertilization with 1/2 pound of nitrogen/M/month gave best sod production, regardless of mowing height. Murray also mentions Dr. Gilbert's reports from N. Carolina on the usefulness of early sowing and adequacy of potassium for maintaining winter hardiness. Also in N. Carolina applications of chopped bark to the roadside berm proved adequate for restraining erosion, as well as providing a suitable surface for later seeding.

In several southern states centipedegrass decline was found to be preventable by a combination of low-mowing, low-fertility, and low pH (thatch was not influential).



#### GEOGRAPHY AND BLUEGRASS SEED PRODUCTION

Hovin and eight additional co-authors report on "Effects of Geographic Origin and Seed Production Environments on Apomixis in Kentucky Bluegrass", in the Sept-Oct Crop Science. This involved research concerned itself with observing aberrant plants produced by widely diversified selections of bluegrass when planted in many different locations. The authors conclude that seed produced outside of the normal range of a cultivar is not likely to have increased aberrant progeny.

#### VARIETAL TESTING OF RYEGRASSES

Bowling, McKee and Duich, Penn State, reported to the Agronomy Society of "Development of a Varietal Purity Testing System for Ryegrass" at the agronomy meetings. No single test serves to separate all varieties, but a series of tests have been worked out and a key to their use established. The tests involve seeds, seedlings, and technologically complicated chromatographic and electrophoretic patterns. They are said to be suited for distinguishing 57 different cultivars.

#### MORE ON THATCH DECOMPOSITION

An article by Murdoch and Barr appeared in the October issue of HortScience, entitled "Ineffectiveness of Commercial Microorganism Inoculum in Breaking Down Thatch in Common Bermudagrass in Hawaii". Bio de-Thatch and Thatch-Away were both employed unsuccessfully over a 50 month period to reduce thatch in the turf. The authors note that only a few wood-rotting fungi are capable of breaking down lignin, the resistant component of thatch.

#### MORE ON TURF GROWTH SUPPRESSION

An investigation by Watschke, Penn State, reported in the September-October Agronomy Journal, deals with "Growth Regulation of Kentucky Bluegrass with Several Growth Retardants". Watschke concludes that none of the materials, including experimentals to which he had access, were suited for use on fine turf, primarily because of discoloration. At reasonable rates some of them, although retarding growth initially, increased it after several weeks in comparison to untreated turf. He feels that presently available growth retardants might have some use on turf that could not be mowed easily, or was of little esthetic importance so that discoloration would not make much difference.

#### HELP IN SPRIGGING CENTIPEDEGRASS

Johnson, Georgia, reports in the September-October Agronomy Journal on experiences in using activated charcoal to protect newly sprigged centipedegrass from later herbicide application. Establishing centipedegrass is difficult because of its sensitivity to most herbicides, and its inability to compete well with weeds (at least in its first year). Dipping the sprigs in activated charcoal afforded some protection, although the benefits were questionable for DCPA (which is generally not so deleterious to the centipede plantings as are most other herbicides). All other herbicides (terbutol, bensulide, simazine, atrazine, benefin, pronamide and butralin) caused diminution of centipede turf vigor after seven weeks, but all of them enhanced vigor ratings if the centipede had received the activated charcoal treatment. Except for bensulide, herbicide effectiveness (i.e. weed control) was not influenced by the charcoal treatment.



## 1976 TURFGRASS RATINGS IN MASSACHUSETTS

The winter, 1976 issue, of the Turf Bulletin (Massachusetts Turf and Lawngrass Council) contains many summarizations of performance of turfgrasses at the University of Massachusetts test grounds, by Carrow and Troll.

Among the perennial ryegrasses Manhattan and Pennfine, and combinations of these cultivars with others, continue to prove outstanding. Every year since 1974 both Manhattan and Pennfine have rated strongly at a 3/4 inch mowing height, and generally moderately ahead at 1 1/2 inches. Blending seems to have been advantageous.

Among fine fescues Jamestown has continued to rate highest, both at 3/4 and 1 1/2 inches. It has been closely followed by Banner, Atlanta and Waldorf for "average quality".

Among Kentucky bluegrasses, Nugget led at 3/4 inch mowing, followed closely by Touchdown, Parade and Merion; at 1 1/2 inches Touchdown led, followed closely by Nugget, Parade, Baron and Victa. Most common types fared poorly. In a separate bluegrass planting made in 1974 Galaxy showed up well.

The data charted in this issue of the Turf Bulletin is more extensive than can be reported here, and reflects ratings each summer month, plus special ratings on diseases that may be of special interest to proprietors.

## GROWTH RETARDANTS ON BERMUDAGRASS

Oklahoma researchers report on "Chemical Retardation of Bermudagrass Turf" in the Nov.-Dec. 1976 Agronomy Journal. While optimum conditions and rates produced significant retardation, on many occasions and under varying conditions grass injury, failure, or erratic results occurred.

## RYEGRASS-BLUEGRASS COMBINATIONS SUCCESSFUL

Niehaus, Ohio, reports upon "Effect of Cultivar, Seeding Rate, and Nitrogen Fertilization on Kentucky Bluegrass-Perennial Ryegrass Turf Mixtures", in the Nov.-Dec. 1976 Agronomy Journal. Niehaus finds that quality of the resulting turf is not decreased by including ryegrass in the mixtures, while there are benefits from having both the ryegrass and a bluegrass present.

Niehaus used approximately 2 pounds of bluegrass to the thousand square feet, one-fourth, one half and equally as much ryegrass. Even where bluegrass and ryegrass were of equal weight, the bluegrass generally constituted 80-90% on a seed count basis. Because of greater aggressiveness, the ryegrass was disproportionately represented in the initial grass population. High-quality "turf-type" ryegrasses were preferable to hay types, and select bluegrasses competed better against the ryegrasses than did common (Kenblue).

This research suggests that the newer turf-type ryegrasses are excellent components for seed mixtures, but that restraint should be shown to hold down the ryegrass percentage (in most cases 20-25% ryegrass provided a better balance of the species, by the second year, after which ecological factors would determine which was most likely to prosper).