

# BETTER LAWN -- HARVESTS

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## ANDERSONS, NEW INSTITUTE MEMBER

We are pleased to welcome "The Andersons", Maumee, Ohio to supporting membership in the Institute. Mr. Ron Meier, General Manager Lawn Fertilizer Section, represents The Anderson Company with the Institute. The Anderson Company has extensive agricultural operations as well as outstanding garden centers in Ohio. President Osburn initiated contact with Andersons in October, Mr. Meier immediately responding. Mr. Meier states that he is looking forward to participation in the Institute program, with which he had not been well versed in spite of Ohio proximity.

## STAFF OFFICE

Mrs. Jane Ebright assumed responsibility for the Marysville staff office on a full time basis beginning November 1, replacing Mrs. Lynda Rudeen who resigned to have a family. Mrs. Ebright's husband Don is associated with the Scott Farm Seed Company in Mechanicsburg; her children are René 15, Steve 14 and John 6, all in school.

## QUARTERLY RELEASES

During the quarter the following items were prepared, in press, or reprinted for distribution:

### Brantwood Publications

(Turfgrass Times & Landscape Industry)

Bull Sheet (Chicago Golf Supts.)

Flower & Garden

Golfdom

House Beautiful

Horticulture

Ohio State University Turfgrass Proceedings

Parks and Recreation

Seedsmen's Digest

Weeds Trees and Turf

Weeds Trees and Turf

"New Varieties, Bane or Boon?"

"The Future For Fertilizer"

"Lawn Quake"

"About Fertilizer, And Feeding The World"

"Timely Turfgrass Topics"

"About Non-Farm Fertilizer Use"

"Trends In The Fine Turf Field"

"Leaves Of Grass For Any Setting"

"New Varieties For Fine Turf"

"Lawn And Garden Fertilizer No

Solution For World Food Shortages"

"Cool Weather Weed Control"

## NEW VRB APPLICATIONS

Variety Review Board Chairman Pepin announced formal application of two excellent new perennial ryegrasses, for inclusion on the Variety Review Board list of acceptances. The two new varieties are Yorktown, sponsored by Loft Seed Company; and Derby, sponsored by International Seeds.

#### DEMONSTRATION PLANTINGS

Plantings on the Institute grounds that include Variety Review Board selections performed very well this autumn. Once the hot weather and drought of summer gave way to nicely spaced rain and cooler weather, Kentucky bluegrasses and perennial ryegrasses (which had survived summer well in spite of dry weather) responded nicely, going into winter dense, attractive, and essentially free from disease. Fine fescues, which had suffered badly this summer, revived remarkably well, although not all varieties filled in completely before snowfall. Bentgrasses on the irrigated area entered winter in remarkably good condition. The autumn growing season was prolonged, with mowing necessary well into November. Heavy snow falling just after Thanksgiving protected turfs from desiccation and "burn" through late autumn.

#### CONCERN OVER FERTILIZER SITUATION

Serious efforts to reserve fertilizer for underdeveloped countries, instead of having it used for turf and ornamentals (non-farm use) in the United States, have been initiated on the national level. The movement was perhaps spearheaded by the series of Jim Grant stories in the New York Times. At least one senator has proposed legislation. The implications for turf performance are obvious, should fertilization be restricted, and many Institute members have expressed concern.

The Institute has an obligation to appraise the issue stripped of its emotionalism realistically. No one begrudges giving up fertilizer if this would translate into a cure for famine. Unfortunately, the small bit of fertilizer possibly saved from not fertilizing turf in the United States could have no consequential influence on world food production. Availability of fertilizer is seldom a limiting factor in underdeveloped lands, other problems being more important.

Dr. Schery, in a series of articles, attempts to point out that fertilizer used in the United States for non-farm purposes is not "wasted", but is vital (in many ways) for supporting the urban ecosystem, making city living tolerable. Yet, diverting this fertilizer for vaguely proposed "food production" in underdeveloped lands (having no system for its useful employment), merely raises false hopes. Prevention of starvation is a matter of bringing populations and resources permanently into balance in the regions of need.

Dr. Schery has been cooperating with a committee of the Fertilizer Institute on this informational program, acting in an individual capacity rather than as Director of an Institute whose main concern is lawnseed. However, the topic is one of national concern, and worthy of mention in Institute releases. A short item along the lines cited is planned for the spring press kit. In the listing of stories for the quarter several titles relating primarily to the fertilizer problem are included. These tie in nicely with increased usage of lawngrass proprietaries, which Dr. Schery recommends.

#### PRODUCT REVIEW BOARD ACTS

At the annual meeting, Mr. J. S. Skaptason was appointed to chair the newly created Product Review Board Committee, intended to parallel the Variety Review Board dealing with grass cultivars. Following several meetings with officers and staff, Mr. Skaptason has drawn up very helpful initial "by-laws" detailing, in general, the suggested procedures. The plan seems quite workable, and Mr. Skaptason is to be congratulated on his diligent efforts. A more detailed announcement will be made after formal consideration of the plan by the executive committee.

#### APPEARANCES SCHEDULED

On the agenda for early 1975 are two platform appearances by Dr. Schery, in which he will discuss trends in the fine turf field before the Ohio Nurserymen Association meeting in Columbus, and new bluegrass varieties at the Massachusetts Turfgrass Conference (University of Massachusetts) in March. President Osburn will also be appearing on the Massachusetts program, so that the Institute will be well represented. We are grateful to Charlie Mruck for arrangements.

#### TRADE PAPER USES ITEMS

Three Institute releases were used in the October 16 issue of Seed Trade News, including "Weed Control Concept Keeps Lawns Cleared", "Bluegrass Grows Most Through Autumn-Winter", and "Lawn Care Efficiency" as titled by the paper. Credit is given to Dr. Schery and to the Institute in these items, and the one about bluegrass lists all of the Variety Review Board approvals as part of the text.

#### INTERNATIONAL PROCEEDINGS SCHEDULED

A letter from Dr. E. C. Roberts, editor for the International Turfgrass Society's Second Research Conference Proceedings, states that all text is now in the hands of the printers, with a release date scheduled for January, 1975. The book will encompass about six hundred pages, with an index of over one thousand entries.

#### PARKS & RECREATION STORY

We are pleased to have had the Institute's story, Leaves of Grass for Any Setting, (so entitled by the editors), appear in the December issue of PARKS & RECREATION magazine. The story was attractively edited, and a feature of the issue. The table of contents "come-on" reads, "The abundance of modern lawngrass cultivars can only be described as a turf manager's delight." Page 19 carries a variety-by-variety listing of "Modern Lawngrass Cultivars", including thumbnail sketches of Variety Review Board approvals. The story has been reprinted for distribution. Its appearance in the official publication of The National Recreation and Park Association should result in much favorable exposure.

#### LANDSCAPE INDUSTRY COMMENT

A letter to editor Morey from The Institute, commenting on the "confusion" (of new turfgrass varieties) editorial in Turfgrass Times as well as Landscape Industry, was printed in the October-November issue. In part the comment reads, "-- complaining about today's abundance --- is looking the gifthorse in the mouth. Whether we can identify with each and every variety is relatively immaterial, since almost all of them are improved over 'common' grass, and in combination make excellent lawn seed mixtures--- a bit of 'confusion' is a small price to pay for a broad-front advance---". Mr. Morey will print an Institute rebuttal in future issues of his magazines.

#### IN SEED TRADE NEWS

The October 2 and October 9 issues of Seed Trade News carried pick-up of Institute releases, respectively "Autumn is Best Time for Seeding Lawns" and "Bentgrasses Are Best for Low-Mowed Lawn". The former emphasizes that "The best time of year to seed lawns with Kentucky bluegrasses, fine fescues, bentgrasses and perennial ryegrasses is autumn . . . ". The latter mentions "Colonial bents . . . grow fairly upright, and are not temperamental . . . Highland is a colonial bent, native to Oregon. Exeter is an excellent selection from the University of Rhode Island. Holfior originated in Holland . . . Creeping bentgrasses . . . a low clipping height. Emerald, however, is reported to do well even under lawn-like . . . care. Kingston is exquisitely fine-textured . . .".

INSTITUTE REPRINT MAILING SCHEDULED

Doris Watson, Hercules, sent samples of cover-copy which will be used in mailing out several Institute reprints to an extensive list of individuals and associates. We are very grateful for this extended mileage given Institute releases through the good offices of Hercules Inc.

COLUMNIST INQUIRY

A November 22 letter from Chuch Vance, "Your World" columnist, requested tidbits of information for use in his new feature. He wants news releases, fact sheets, speeches, brochures, etc., and says "I'll appreciate any exclusive material -- any unusual angles." There may be chance, here, to work in a few mentions of benefit to the Institute program.

JOURNAL OF THE CHICAGO HORTICULTURAL SOCIETY

The Institute has been requested to supply information for the Journal of the Chicago Horticultural Society, the winter issue of 1975 of which will feature a directory of organizations that public services of a horticultural nature. Sample reprints have been provided the society, mentioning that these would be available upon request and receipt of a stamped envelope.

GARDENS FOR ALL, INC.

Gardens for All, a nonprofit educational organization, which has listed Dr. Schery as a member of the "honorary board of directors", published an attractive color brochure. The corporation's objective is, "--- so that all who want to garden have the opportunity to do so." Membership is ten dollars, and of course larger donations are welcomed. The address of Gardens for All, Inc. is 163 Church Street, Burlington, Vermont 05401.

SCHOOL DISTRICT REQUEST

The East Allegheny School District, Pennsylvania, has written the Institute asking for suggestions about high school vocational training, including turf. Sample reprints have been sent Dr. Phillips, federal co-ordinator for the district, offering to supply same for classroom use.

TECHNICAL SCHOOL USES LITERATURE

Wayne Gurly, Instructor at the North County Technical School, Florissant, Missouri, asked for samples of Institute literature for possible use in class teaching. A sampling of reprints was sent, which Mr. Gurly read with interest: he telephoned the Marysville office requesting thirty copies of each for use in class work. More than twenty reprints are involved, representing over 600 copies put to this very worthwhile use.

INTERESTED IN BRITISH GRAVITY APPLICATORS?

"We have been given your name by the American Chamber of Commerce (United Kingdom). We are manufactures of the Driftmaster and Vortex range of sprayer equipment, full details enclosed, and we are currently investigating the possibilities of exporting our machines, particularly the Driftmaster to the U.S.A." --- Richmond Gibson Limited, Gonerby Hill Foot, Grantham, Lincs.

LITERATURE SENT TO SOUTH AFRICA

Interest in American turf cultivars has been evinced by C. May & Company (Pty.) Ltd., South Africa, in correspondence with the Institute. Upon request reprints about Institute varieties has been sent to Mr. Michael Zingle, Director.

ACKNOWLEDGEMENT

"We at the Gardener's Catalogue wish to thank you for the cooperation and the material used in the Gardener's Catalogue. A copy of the book is being mailed to you with our appreciation." --- Tom Riker, Horticulturalist

NEWSPAPER SUPPLEMENT

"Mike Wolfe of the AAN has passed along to me your materials for the Lawn & Garden Newspaper Supplement ---. The stories and photography are splendid." ----Paul Dawson, in charge of production.

SPRING PUBLICITY BEING PREPARED

The Institute is engaged in a two-prong effort to publicize lawngresses and their care through newspaper stories. One effort is in partnership with the National Arborists Assoc., the National Swimming Pool Institute, and the American Association of Nurserymen: a Supplement is issued, in newspaper column style, for easy pick-up by smaller newspapers and magazines which seldom have a garden editor to develop copy. The material can be simply lifted from the Supplement without setting of type. About a half dozen Institute photographs appear. The Turfgrass Division of the American Seed Trade Association has kindly shared our costs. This year the Supplement is being produced by Paul Dawson organization, at the suggestion of the AAN.

The Institute's own distinctive Press Kit in the "green grass" folder, will begin production during January. Coverage parallels that of the Supplement, but the materials are directed more to larger newspapers and established columnists who prefer to draw upon materials for their own composition. Of course many of the stories are used verbatim, frequently with full credit. We look for continued fine acceptance of this traditional release, with interest perhaps heightened because of the current ferment about shortages and environmental matters. The two issuances together pretty well blanket the newspaper and specialized magazine fields, as well as serving some radio and TV outlets.

PARKS AND RECREATION STORY

"Leaves of Grass for Any Setting" was the title the editors of Parks and Recreation bestowed upon the Institute story which appeared in the December issue. The article traces the evolution of modern turfgrass cultivars, and carries a full page alphabetical summarization of the Variety Review Board acceptances. The advantages of new varieties is stressed, - particularly how they fit modern maintenance. The usefulness of Trimec herbicide, and Nitroform fertilizer, receives mention. The story was reprinted for inclusion in the spring press kit, and sample copies were mailed to all the membership just before Christmas.

THANK YOU

Thank you very much for participating in the educational sessions of the recent Ohio Turfgrass Conference and Show. Due in part to your contribution, we again had a very successful Conference. ---- David P. Martin, Executive Secretary

TECHNICAL SECTIONSYMPOSIUM ON ENVIRONMENTAL CONSIDERATIONS IN TURFGRASS MANAGEMENT

Invited papers on the title subject were presented to a joint session of the Turfgrass Division and the Land Use Management Division, at the national agronomy meetings in Chicago, November 14. It represented a useful extension of information beyond the technical papers typically given on turf alone.

Dr. B. G. Ellis, Michigan State, spoke about utilizing sewage effluent for grass irrigation in humid regions. He mentioned that effluents vary greatly, sometimes contain toxic elements, and usually must be supplemented with nitrogen and potassium to provide balanced nutrition for turf. Boron and sodium may sometimes cause trouble. Biggest drawback, however, is that turf in humid regions can effectively use effluent only during the dry summer months, making it a poor disposal means year-round.

Dr. G. V. Johnson, Arizona, spoke of using effluent in arid regions. He wondered about sufficient effluent to match evapotranspiration, or whether supplementary irrigation might be needed (thereby increasing costs). While application of effluent to turf is quite effective in "purifying" the effluent, it would supply only about 40% of the nitrogen needs when used at a rate sufficient for water requirement. The practical problems in effluent use in arid regions are different from those in humid regions, but no less troublesome.

Dr. R. A. Mecklenburg, Michigan State, discussed the role of vegetation in moderating temperature and noise in the urban landscape. Plants can reduce infrared surface temperatures as much as 30°C, and air temperatures as much as 4°C. A plant canopy moderates the "heat island" characteristic of cities in summer. Needled evergreens are most effective for reducing low-frequency sound, broadleaf plants for high-frequency sound. Various types of plantings were reviewed, for their efficacy in sound control. Statistics show great benefit from urban plantings, including reduced child mortality, less suicide, and reduced energy consumption.

Dr. D. V. Waddington, Pennsylvania, related turfgrass fertilization to the environment. Depending upon how fertilization is done, it can be beneficial or detrimental (beneficial effects include noise abatement, heat reduction, air improvement, erosion control, beautification, etc.; detrimental effects can occur when nutrients enter water supplies). Less water pollution can be expected when controlled-release nutrients are employed, and with soils less subject to percolation. On the whole turf plantings are underfertilized rather than over fertilized: the averages for Virginia and Pennsylvania show only about 1/4 pound N/M used annually for lawns, considering the states as a whole.

Dr. V. B. Youngner, California, discussed air-pollution and its influence on grass. The smog problem in California has been due primarily to ozone and PAN (peroxyacetyl nitrate). Acute injury can occur to grass from these pollutants, the severity relating to the age of the tissue and the temperature. Differential susceptibility among varieties has been noted. Strains of common bermudagrass are relatively resistant, whereas the African bermuda hybrids (such as the Tifton group) are quite susceptible, (although the California selection,--Santa Ana, is smog resistant). Poa annua is quite susceptible, the ryegrasses and most bluegrasses moderately so, with zoysias and st. augustine most resistant.

WESTERN NORTHWEST SEED PRODUCTION

Impressions on seed production in Oregon and Washington were refreshed through a brief visit by Dr. Schery in mid October. In addition to visits with Vice President Doyle Jacklin, Variety Review Board Chairman Gerald Pepin, and board member Jim Carnes, Dr. John Thorne, Director of Research for Vaughan-Jacklin kindly set up meetings at the Puyallup station in western Washington (Drs. Roy Goss, Charles Gould, Stan Brauen) and at Oregon State University, Corvallis (Dr. Dave Chilcote and others). Dr. Alvin Law, Washington State University at Pullman was also met at Hangman's Valley golf course, where the eastern Washington counterpart of the bentgrass trials have been established.

Some discussion about the plethora of new turfgrass varieties coming on the market, now abundant enough to be "confusing" even to turfgrass professionals has taken place in the press. Judging from fields being readied for production, still more will make their appearance in the near future (although some of the older or less productive ones may be dropping out). Most of the new propriety varieties seem to be in "strong hands", so that their attributes will be fully investigated and the evaluations revealed. Other than that there may be some bias in favor of high-yielding varieties, the industry seems intent upon producing improved varieties with real advantages for fine turf. In time some may "wash out" due to new strains of disease or other deficiencies, at which time it should prove comforting to have a broad range of selections from which to choose. The wealth of proprietaries would seem a strength rather than a weakness (as the proponents of "confusion" seem to suggest).

The extensive Washington State University bentgrass comparisons are still too new to provide definitive conclusions. But already a great many "eliminations" have been made because of a susceptibility to disease or other deficiency. It is encouraging that a number of varieties available from seed were showing up nicely at the time the test plots were inspected, including particularly Emerald creeping bentgrass and Kingstown Velvet bentgrass. Observations by the experts will be eagerly awaited as these bentgrass tests continue to mature.

The Puyallup station has extensive bluegrass, fescues, and perennial ryegrass plantings, as well as bentgrass. Interestingly, quite striking differences were noted in these plantings at time of visit (Oct. 24) at the short mowing height (3/4 inch), while the taller-mowed grass (1-1/2 inches) showed almost all varieties to look very much alike. Among the short-mowed bluegrasses Majestic, Bonnieblue and P-59 were especially attractive, with Adelphi and Galaxy not far behind. Majestic was probably "best of show" on this date.

One of the diseases quite frequent in western Washington, seldom seen on eastern turfs, is Ophiobolus. Ophiobolus blemishes often resemble the "frog eye" stage of Fusarium seen in the East. The research men commented that Pyrenopeziza, not much in evidence yet, becomes severe during winter, and often severely attacks bluegrasses of the Sydsport-Victa-Vantage group. General tone of the grasses seems to be improved by sulphur applications at Puyallup: high nitrogen fertilization with no sulphur leads to trouble, and is a good argument for "balance" in the fertilization regimen. Dr. Goss has some interesting comparisons where sulphur applications have done much to eliminate Poa annua (a weed that phosphorus generally encourages).

Turfgrass activity at Oregon State University, aside from the well-known seed testing laboratory, centers these days chiefly on the field burning problems. Dr. Chilcote is investigating several approaches, none of them yet entirely feasible economically. He wonders if eventually some sort of "compromise" might not be reached, where field burning is not entirely abandoned but is reduced through a combination of

PACIFIC NORTHWEST SEED PRODUCTION (Continued)

briefier planting cycles (new plantings don't need burning until they become sodbound), straw removal (for other economical uses, perhaps partially subsidized), and more portable pieces of machinery (still to be perfected) that can be utilized if current research proves that the heat (rather than just straw removal) is necessary for the "physiological shock" that gives abundant seed yield.

Demonstration plots of turf in the Willamette Valley indicate great enthusiasm for the new turf type perennial ryegrasses in the area. Indeed, at time of visit, most varieties being considered for release looked as attractive in the plantings as does bluegrass. Many of the new perennial ryegrasses should prove very useful in milder, temperate climates similar to that of the Willamette Valley.

AGRONOMY MEETINGS, NOVEMBER 1974

The 66th annual meeting of the American Society of Agronomy was held in Chicago, Nov. 10-15. As customary, the American Seed Trade hosted a reception for the officers, the press, and other dignitaries. Dr. Schery represented the Institute. The overall theme of the conference was food production, concerning which there were several challenging symposia, in which a series of presentations on the fertilizer situation touched closely upon current Institute interests. Even the turfgrass division crossed discipline boundaries for a symposium that brought in discussion from land planners and landscapers, of considerable interest what with continuing urbanization. The turfgrass division devoted Wednesday to its usual tour of nearby facilities, which included the Warren sod farms and research center, two golf courses, and the new Chicago Horticultural Society facility now in final construction. Highlights of some of the papers presented to the turfgrass division may be of interest:

The opening series dealt with turf management. A Florida report indicated that "fertigation" (introduction of fertilizer into the irrigation system) was proving quite satisfactory, now that inexpensive but reliable fertilizer metering devices are available. Labor-saving was considerable. At the University of Rhode Island, potassium did not influence freezing tolerance of tall fescue.

At VPI, management (particularly mowing height) was related to incidence of leafspot disease. Contrary to the usual finding, low-mowed turf had fewer leaf lesions than high-mowed turf. Dr. Couch indicated that it is possible to turn a variety either resistant or susceptible to the disease by the kind of management given: by implication, present means for evaluating new lawngrass varieties are inadequate.

In North Carolina manganese toxicity was investigated, a risk with certain soils of the region. Anytime manganese exceeds 2 ppm damage can occur, with taller-mowed bentgrass being more tolerant than shorter. Research in Illinois relating to pre-emergence weed treatments for vegetatively established Kentucky bluegrass gave contradictory results, different in greenhouse compared to outdoors. In the greenhouse DCPA proved best, but outdoors oxadiazon gave best results. All treatments, at least in the greenhouse, were to some degree harmful to rooting, rhizoming, or other aspects of bluegrass growth.

In Virginia iron fertilization of bentgrass was found useful, often moderating stress (especially in summer). At Penn State heavier rates of nitrogen gave better recovery with Merion bluegrass after various kinds of stress, including scalping. Nonstructural carbohydrates were lower in fertilized than unfertilized turf, and were obviously influenced by the nitrogen treatment.



## AGRONOMY MEETINGS, NOVEMBER 1974 (Continued)

Dr. Wakefield of Rhode Island, spoke on the Competitive Effects of Turfgrass on the Growth and Development of Ornamental Shrubs. Even when amply fertilized, grass severely held back shrub growth (due to competition or allelopathy?). Bare soil provided better growth than a mulched surface, although possibly temporary competition for nitrogen occurred when mulch was used that could have been overcome by extra fertilization? Test grasses were bluegrass and fine fescue.

Mowing height was investigated on three perennial ryegrasses at the University of Massachusetts. Ryegrass outcompeted Merion Kentucky bluegrass at all cutting heights, but was less competitive in low-mowed bentgrass than in bluegrass. Ryegrass rooted more deeply, more quickly, than the other species: it is more vigorous at taller cutting heights than at lower ones. Johnson, Georgia, discussed use of EPTC for controlling grass in sandtraps; to a large extent both bermudagrass and crabgrass were kept out of the sand, without boarder damage to turfgrasses nearby.

Turgeon, Illinois, reported possible difficulties from repeated applications of preemergence herbicides on Kentucky bluegrass. Arsenate and bandane caused increase of leafspot disease, greater wilting, reduced root growth, and substantial development of thatch. This may have been the results of a chain of events, whereby the chemicals eliminated earthworms (which would have consumed the thatch), in turn resulting in shallow-rooting, poor infiltration, etc. etc. Bandane remained pretty well localized in the thatch, but calcium arsenate became distributed throughout the upper soil profile. Other chemicals had milder effects, hardly measurable with benefin, DCPA and siduron.

Research at Purdue involved examination of grass response to nine growth regulators. While differences could be noted, on the whole these were erratic and not significant. In some cases rhizoming, tiller production, root length, and topgrowth were severely decreased. In no instance was reduction in height combined with an increase in tiller or rhizome production, or better rooting. At Southern Illinois University, foam materials were successfully employed, in sprays, although the economics were questionable.

Burns, Georgia, successfully used a number of growth retardants on tall fescue, experiencing some injury at certain rates, and little control at others. On Southern grasses there were a number of cases of discoloration, but the applications were not lethal. Seedhead formation was often repressed. However, it was concluded that none of the treatments were really good enough to substitute for five successive mowings, (necessary to make the treatments economically justifiable according to highway department reckoning). University of Missouri researchers reported upon the internal structure of zoysia and bermudagrass, as revealed by the electron microscope. The anatomy of both genera was very similar. Michigan researchers investigated the physiology (whether C3 or C4 metabolism), of a number of grass tribes. The paper was more concerned with methodology in determining carbon fixation pathways than in concluding the proper taxonomic placement of genera.

At Michigan State, response to reduced light intensity by Merion bluegrass and Pennlawn fescue was studied. Vascular tissue decreased, and other anatomical differences were noted in bluegrass under low-light intensity, but were not pronounced with fescue. One prominent difference was that dark-respiration decreased at low-light intensity with fescue, whereas this was not the case with Merion bluegrass; this would result in better balance between photosynthesis and respiration in fescue than in bluegrass, and might account for better shade adaptation with fescue.

AGRONOMY MEETINGS, NOVEMBER 1974 (Continued)

In Arizona, sulphuric acid applied to calcareous iron-deficient desert soils prior to seeding, and sulphuric acid introduced into irrigation waters, were highly effective in preventing chlorosis with bermudagrass, - more so than using iron sulfate or iron chelate. In Ohio, silica was found more abundantly in stubble than in leaves, and in leaves than in roots, and seemed related to decomposition of organic materials with tall fescue (the correlation did not hold well with bluegrass).

Florida study showed excellent performance of Tifgreen bermudagrass on a golf green without overseeding, suggesting little need for overseeding. Of the overseeded grasses, Manhattan ryegrass was superior to all others for the first four weeks (under simulated wear), but was about like other ryegrasses after eight weeks. In general the varieties which germinated most rapidly and established most quickly were the most tolerant to traffic. Studies at Auburn University showed rather little difference in low temperature hardiness among centipede grass varieties, although a combination of low night temperatures and short photoperiods (8 hours) provided maximum hardiness in general.

Michigan State research confirmed that for bluegrass, fescue and bentgrass alike, significant amounts of nutrients are carried in the clippings. The nitrogen content for bluegrass averaged about 4.2%, for fine fescue 3.2%, and for creeping bentgrass 4.6%. Phosphorus content ranged from a little below to a little above 0.5%, and potassium a bit above 2%. Similar average nutrient contents in clippings are given for secondary and minor nutrients as well.

In Virginia, annual ryegrass performed poorly as a wintergrass. Perennial ryegrasses, on the other hand, were quite good, but were a bit repressive to bermudagrass at spring transition. When fine fescue was combined with the perennial ryegrass, esthetics were hurt, but transition was a bit better. Bluegrass reduced the turf quality in spring, going out suddenly, (Poa trivialis was even less satisfactory). A study in California, Riverside, showed clipping of bluegrass to be detrimental to growth, especially when root temperature was high, Scott research indicated that chromosome counts in Bristol bluegrass (hybrid between Bellevue and Anheuser) varied considerably (between 94 and 100; a couple of aberrant plants had only 49 and 56).

THE OHIO TURFGRASS CONFERENCE AND SHOW

The Ohio Turfgrass Conference is one of the larger of such state activities, and this year served as a convenient convening point for meetings between President Osburn, Committee Chairman Skaptason, and Dr. Schery. The Institute's presentation will appear in the proceedings, and possibly may prove useful for reprinting and distribution (Dr. Schery's title was Trends in the Fine Turf Field, which emphasized abundance of excellent lawn varieties, and restrictions upon non-farm fertilization).

Gleanings from the educational sessions may be of interest to members. Dr. Wilkinson, Ohio, opened with a review of the problems encountered with the new test "greens" at O. S. U. Uniformity in throughput has not been achieved, and they are abandoning automatic irrigation by tensiometer. "Dry spots" showed up, through which water would penetrate only very slowly; apparently hydrophobic "secretions" develop at the thatch-soil interface. Dr. John Street, Ohio, followed with a discussion of thatch. Main disadvantages from thatch are: interception of applied materials, water barrier, and habitat for unwanted organisms. Street theorizes that silica in leaf tissues may hinder decomposition, the encrustation acting as a physical barrier impeding decay. Stubble has more silica than leaf, but roots have rather little.

THE OHIO TURFGRASS CONFERENCE AND SHOW (Continued)

Dr. Morton, Ohio reviewed weed control. He was particularly "high" on Basagran (bentazon) for selective elimination of nutsedge. It is not known whether BASF-Wyandotte, will apply for registration for use of this compound in turf, although it is already registered for soybeans.

Mr. Saladini, Ohio, has been investigating Pythium blight, finding five active species in Ohio, only two of which are commonly credited with causing blight. He mentioned that Sydsport and Nugget are the most susceptible of all bluegrasses to the disease. Dr. Larsen, Ohio, followed up with a general discussion of turfgrass diseases, stating that preventive fungicides such as Daconil and Dyrene have given the best control; systemics have generally failed, as resistant strains of disease quickly build up. He suggests alternation of "preventive" fungicides with systemics.

Dr. Niemczk, Ohio, is particularly interested in soil grubs, and is establishing a national center for their study. The only insecticides registered for soil usage are Dylox, Dursban and Diazinon, - none of which have proved particularly effective (because they do not penetrate deeply into the soil through the thatch). It is not certain whether others will be registered for turf use, but good results have come from Furadan (Niagara Chemical) and a Ceiby material as yet unnamed. Dr. Reidel, Ohio, reviewed the abundance of nematodes in Ohio soils, for which no controls have been particularly effective (nor have the nematodes been particularly disastrous).

Dr. Henderlong spoke about the effects of nitrogen fertilization. When nitrogen was leached through a bare soil column (no vegetation) over 50% of the nitrogen was "lost" (unaccounted for). But when grass was grown on the soil, 120% of nitrogen applied was "recovered" (indicating that the microflora associated with growing grass actually contributes an extra 20% of nitrogen). Dr. Henderlong pointed out that such findings must be judged in the context of the experimental conditions, and are not necessarily indicative of what happens generally in the field; nevertheless, it was interesting that the greenhouse experiments showed rooting of grass to be considerably less when IBDU was used as a fertilizer than when UF was employed.

Subsequent sessions were split into golf course, schools and athletic fields, lawns and general grounds, cemeteries, and sod producers sessions. Papers were generally of a specialized nature, and review is best left for the proceedings.

Out-of-state experts were brought in for the Wednesday afternoon general session. Dr. Beard, Michigan, discussed the influence of watering on turf. Dr. Cole, Pennsylvania, reminded listeners that nature does a pretty good job of keeping disease control in bounds, and that we get into trouble only when some of the ever-present diseases are "released" through improper management. Introduction of irrigation, for example, has brought on many problems not evident when lawns and fairways underwent summer dormancy. Dr. Cole pointed out how complicated the interrelationships are, and how some diseases respond, for example, to high levels of nitrogen, whereas others become "released" by low levels. His general philosophy is to use fungicides in ways that have proven effective, but above all to keep the grass growing in an optimum fashion so that tissue damage can be quickly repaired.

Dr. Wilkinson, Ohio, reviewed shade tolerance, pointing up the usual causes for turf weakening in the shade. His idea that turf in the shade should be fertilized less is perhaps questionable (what about tree root competition?), but certainly on quality of light, height of mowing, infrequent-but-thorough irrigation, etc., his insights are important. Wilkinson cited Nugget and A-34 as the two most shade-tolerant bluegrass cultivars, oftentimes better adapted to shade than is red fescue (the best adapted species in his listings).

THE OHIO TURFGRASS CONFERENCE AND SHOW (Continued)

followed by bentgrass, ryegrass and bluegrass). Other topics of discussion were winter injuries (Dr. Duff, Rhode Island), and heat stress (Dr. Martin, Ohio). The final sessions on Thursday reviewed the energy crisis, fertilizer availability, outlook for equipment and turfgrass maintenance supplies.

AGRONOMY ODDS-AND-ENDS

Aside from the research papers presented to the Turfgrass Division, summarized elsewhere, members might be interested in some of the activities and the trends showing up at the American Society of Agronomy meetings in Chicago this November. Noteworthy were the extensive series of papers on Environmental Quality (a relatively new division of this Society), and the multitude of reports on sulphur-coated urea as a fertilizer.

As to the Environmental Quality sessions, much interest was shown in water pollution (from feedlot wastes, herbicides, plutonium, or what not); handling of spoilsbanks; utilization of sewage effluent; and environmental monitoring in general. A few typical examples, touching upon Institute interests, include:

Nebraska research discovered appreciable nitrate accumulation underlying southwestern Nebraska, accumulated naturally before America was inhabited. Up to six tons of nitrate nitrogen per acre is estimated for the upper thirty yards or so of the Sandhill uplands. Here is an instance of nature rather than man "polluting" the watertable (agriculture is usually accused when nitrates are found subsurface).

Agricultural fertilization is likewise accused of "contaminating" watershed runoff. A Cornell University investigation, involving 2100 samples from rural areas, monitoring phosphorus, showed that 70% of total P was exported in runoff after storms. Most of the phosphorus came from desorption (release) from bed sediments, and less than 15% of the soluble phosphorus was derived from farming operations. It was concluded that "Less than 1% of the phosphorus supplied to the landscape as chemical fertilizer and manure is lost from the watershed in biologically available form". Another study, in North Carolina, on a grassed watershed that was differentially fertilized over a two year period, showed that all treatments " -- had virtually no effect on nutrient transport in surface runoff and base flow." As a matter of fact, atmospheric additions exceeded the nutrients removed in drainage water.

A study by Beltsville (USDA) investigators, concerning persistence of chlorinated hydrocarbon insecticides over a period of twenty years was not so encouraging. After seventeen years as much as 52% (toxaphene) remained as identifiable residue (over 30% with chlordane, dieldrin and aldrin). Residues remained primarily in the plow layer, indicating little movement through the soil. DDT residues, after 22 years, persisted in a range of from 17% to 64% (this highest figure on a muck soil in New Jersey). DDT seemed to biodegrade better at low concentrations, perhaps because abundant accumulation inhibits the microorganisms carrying on degradation. Interestingly, certain extracts of cattle manure (Nebraska) stimulated seedling growth if applied at moderate rates, but other extracts were harmful and may cause reduced plant populations and decreased seedling vigor.

Over forty papers mentioned "sulfur-coated urea" in their titles, and probably as many more reported on it under other headings. Scanning abstracts of these papers it is apparent that a sulfur-coating is sometimes advantageous, sometimes not so. Usefulness depends on whether sulfur is needed (or whether it simply "dilutes" the nitrogen), whether loss by leaching is a problem, and whether the particular ecosystem is equipped to absorb and hold nitrogen or not. Typically, urea pills are sprayed with molten sulfur, and in

AGRONOMY ODDS-AND-ENDS (Continued)

some instances further coated with waxy petroleum derivatives and a conditioner. Apparently considerable cracking of the coating during handling occurs, allowing escape of soluble urea more quickly than expected. In other instances the coatings may be so impervious that the urea is essentially held from the crop; but it may be released in a surge when the coating does finally crack up. Most of the papers were on agricultural crops, although Waddington, Pennsylvania, reported upon sulfur-coated urea (SCU) for fine turf. Papers concerning pastures and meadows may have some applicability to lawns.

In South Dakota SCU applied to cool-season grasses reduced yield compared to readily soluble nitrogen. Carry-over into a second year was variable. In Alabama SCU granules were monitored for release of dissolved urea at two or three day intervals; time for complete dissolution ranged from a few days to several weeks, with those granules having imperfect coatings being quickest to dissolve. The researchers conclude, "A third fraction of granules seemed to be so effectively coated that no measurable release occurred in 120 days." In Missouri, 3 SCUs were compared with urea and ammonium nitrate for influence on two warm and two cool-season grasses. There were no significant differences in yield (except in one case at an especially high rate).

Waddington's investigations in Pennsylvania were more definitive for fine turf. SCU and eleven other fertilizers having different nitrogen sources were compared on Kentucky bluegrass and creeping bentgrass applied in autumn, late spring and summer. SCU gave intermediate growth responses the first year, but was among the most influential sources the second year. A single SCU application to creeping bentgrass in spring did not have enough residual effect for response in autumn. Waddington concludes "--- performance was similar to that of other slow-release fertilizers". He found that "release was quicker when coatings were sulfur and wax, rather than sulfur alone."

PURDUE UNIVERSITY FIELD DAY REPORT

A summary has been sent out covering the Purdue University Field Day September 30. A review of some of the highlights might be of interest, although full significance could only be obtained through attendance.

Crabgrass preventers have generally been quite effective (about 90% control) during nine years of testing, without any apparent damage to the permanent grass. Follow-up treatments at light rates are recommended. Calcium arsenate has toxified the soil not only to crabgrass, but to Poa annua, chickweed, earthworms and grubs. However, the arsenate plots are professionally tended (aerified, thinned, etc.), a substitute for such things as earthworms. The chief source of calcium arsenate has dropped production, so that product to continue treatment may be lacking (readers are urged not to fertilize with phosphorus, for fear of nullifying the arsenic toxicity built up, which cannot now be replenished).

Post-emergence crabgrass controls through summer have proved excellent, too, especially when two or three applications are used.

The plethora of bluegrass varieties is commented upon, noting that the confusion has only just begun. It is difficult to know how very many of them respond to various aspects of care. Dr. Daniel groups varieties according to supposed similarity, into nine categories. The search for low-growing dwarf types continues, as it does for a competitive roadside type. Over thirty varieties are listed, along with the proprietor and date of introduction.

PURDUE UNIVERSITY FIELD DAY REPORT (Continued)

Performance of slow-release fertilizers is graphed for a ten-week period, on the basis of clipping yields (not necessarily the best indication of a fertilizer's usefulness). Two IBDU formulations gave the greatest response after ten weeks, the Scotts mix the earliest response (though tailing off after eight weeks). UF and combinations of UF with sewerage sludge were fairly closely grouped and still on the upswing after eight to ten weeks.

A lengthy chart rates post-emergence broadleaf weed control, apparently after a turf renovation that included chemical knockdown and reseeding with a combination of Manhattan ryegrass - Koket fescue - Bonnieblue bluegrass. Since the products listed are mostly under code designation, and the ratings are not clearly defined as to significance, it is difficult to interpret the presentation. Four of the products were apparently quite damaging to turf, but the majority innocuous. Only a few seemed to give really good broadleaf weed control, although a number were quite effective against clover.

Growth retardants have been extensively tried, although again most are listed under code designations. None showed really severe toxicity, and a few reduced growth (judged by clipped weights) up to two-thirds over a three-week period. No mention is made of side effects, or practicality of the treatments.

The Purdue interest in various rooting mediums is covered at some length, applicable chiefly to golf greens. The observation is offered that Dr. Daniel has not in twenty years noted a phosphorus deficiency in turf in use, although some experimental deficiencies around the country are noted. The conclusion is that, calcareous, sandy soils "will need ample repeat phosphorus to stay in medium levels of availability."

IRRIGATION CONFERENCE PROCEEDINGS ISSUED

The proceedings for the 12th. annual (1974) Turfgrass Sprinkler-Irrigation Conference were received from the University of California extension service. As in the past, this 70-page softcover book provides in-depth discussions on the "state of the art" in that part of the country where irrigation is perhaps most important.

Many of the considerations in turf irrigation are of a mechanical rather than biological nature. At least the first half of the volume deals with water supplies, sensing devices, pumping mechanisms, and so on. Obviously a turf custodian in arid sections of the country must be in good measure an "engineer".

One might conclude that, overall, the trend to increasing automation has not been free of problems, and that the professionals do not trust automatic sensing devices except as they are in turn "supervised" by a custodian who can make alterations to fit local situations. The older sensing devices, depending as they did upon the electrolytic qualities of the water rather than upon the quantity of water itself, have been abandoned where fertilizers are used. Tensiometers measure water availability more accurately, but are best used as sensors to indicate when there is adequate moisture in the soil rather than as a device for turning systems on (i.e. they work quite well in "telling" an automatic system when to skip a particular cycle because moisture is already adequate). All of this sounds pretty complicated and expensive, as it is; but Glen Larson sums up his paper by pointing out that "with water approaching an average cost - - from \$300 to \$600 per acre per year, - - we need all the help we can get to make our systems just as efficient as possible". A California golf course water bill might easily be \$50,000 annually entirely aside from capitalization of equipment and supervision.

IRRIGATION CONFERENCE PROCEEDINGS ISSUED (Continued)

Dr. Younger reviews water relationships from the turfgrass viewpoint. His tabular material shows fescues, bluegrasses and ryegrasses to be of "medium" rooting depth, compared to bentgrasses and annual bluegrass (which are "shallow"), and tall fescue, bermudagrass and zoysia grass (which are "deep rooting"). Dr. Endo discusses diseases, pointing out the general necessity for moisture for fungus activity (most spores require 12 hours or more of moisture in order to germinate, so that intermittent drying out on a briefer cycle helps in disease control). The California pathologists have become quite involved in the "ecology" of pathogens, showing that whether or not the saprophytes are flourishing may determine whether a disease organism can become virulent. The theory is that certain saprophytic bacteria living on litter produce gasses that are repressive to Helminthosporium, and that these reduce activity if the turf is let dry out, permitting "release" of the Helminthosporium disease. If this theory is accepted (and it seems questionable in the East) a paradoxical situation arises in which watering both causes disease and prevents it (at least leafspot).

GRASS AND LEGUME RESPONSE TO pH

Rutgers University researchers, reporting in the September-October Agronomy Journal, confirm that fine fescues grow better in acid soils than in those with a higher pH. However, lawn species are broadly tolerant, even though performing somewhat better at a certain pH. Bluegrasses, perennial ryegrasses and legumes (alfalfa, trefoil, clover) generally do better at a higher pH approaching neutrality.

PRONAMIDE REGISTRATION EXTENDED

Weeds Today notes that Kerb (pronamide) has now received added registration for both pasture and vegetable uses. Kerb is especially effective against winter annual grasses in the South, and is often used selectively to eliminate Poa annua from bermudagrass.

NITROGEN FERTILIZATION OF MERION BLUEGRASS

Watschke and Waddington report, in the September-October Agronomy Journal, of the "Effect of Nitrogen Source, Rate, and Timing on Growth and Carbohydrates on Merion Bluegrass". It is believed that high carbohydrate reserves benefit bluegrass going into hot weather, whereafter drain on reserves exceeds production and accumulation. Excessive nitrogen stimulation in spring is known to deplete reserves. It is not surprising that the "slow-release" sources of nitrogen are advantageous in maintaining carbohydrate reserves, a sort of "insurance" against hot weather stress (readily available sources would need to be applied quite lightly and very frequently). The study suggests that nitrogen release from both UF and IBDU is more dependent upon rainfall (moisture) than upon temperature. Periodic cool spells during the summer help replenish carbohydrate reserves.

ALLELOPATHY

While reports of one species chemically repressing another are frequent, and have often included turfgrasses, documentation is widely scattered and of varying reliability. Thus a new book by E. L. Rice, University of Oklahoma, (Academic Press), entitled Allelopathy, is welcomed. It is said to be the first book on allelopathy published in the English language, and provides a comprehensive overview of the field. Most of the discussion relates to natural ecological systems, but sections are devoted to agriculture horticulture and forestry, with one chapter on the prevention of seed decay before germination.

GOOSEGRASS CONTROL IN BERMUDESA

Hawaiian researchers report in the September-October Agronomy Journal on successful control of goosegrass in bermudagrass, using a combination of triazine (simazine or atrazine) with arsonate (MSMA). Apparently the triazine and arsonate are synergistic, in goosegrass kill, and the triazine prevents replacement of goosegrass due to new seed sprouting.

HERBICIDES AFFECT SEED PRODUCTION

Research by Canode, Washington, reported in the Nov.-Dec. Agronomy Journal, reviews the influence of selective herbicides applied to bluegrass, bromegrass, orchardgrass, wheatgrass and fine fescue seed production fields. Most of the herbicides, when used at recommended rate, did not affect yields, and seldom germination. Propham applied in September to red fescue did reduce yields, as was the case with dicamba on bluegrass in spring (other species were less tolerant than bluegrass). Picloram reduced bluegrass seed yield on young stands, but not older ones, and again other species were less tolerant than bluegrass. Red fescue and bromegrass yields were reduced by 2,4-D applications in spring. Dicamba, applied in spring, seemed most likely to affect germination, especially in bromegrass and red fescue.

SKEPTICAL OF TURF GROWTH RETARDANTS

Dr. Watschke, Pennsylvania State University, is quoted in the fall issue of the Massachusetts Turf Bulletin, on remarks made about growth retardants (originally appearing in Crops and Soil, April-May, 1974). Watschke does not feel that useful retardants are imminent. He feels that the drawbacks outweigh the benefits. A chief disadvantage is discoloration: use of chemicals sufficiently strong to retard grass growth discolor the lawn. This may last many weeks.

Another drawback is that retardants affect the whole plant, not just the foliage. Roots, rhizomes, etc. are all weakened, and compete less well with weeds. In some cases retardants increase susceptibility of the grass to disease.

Finally, after retarding influence of the chemical is spent, a stimulating influence often ensues, resulting in more rapid growth and extra mowing. Reapplication of the chemical is seldom desirable because chances of injury are magnified in hot weather.

GRASS SEED PRODUCTION AND HERBICIDES

C. L. Canode, Washington, reporting in the September-October Agronomy Journal, discusses the influence of several herbicides on the growth and yield of five species of grass planted for seed (included among them were bluegrass and fine fescue). On the whole bluegrass was little affected by herbicide treatments, although their timing did have some influence. Dicamba applied to bluegrass in September did not reduce seed yield, but an April application did. Seed yield of bluegrass was reduced by picloram even if applied in September. It reduced red fescue seed yields slightly if applied in April. Dicamba in April lowered seed germination with most species, and occasionally even when applied in September.