

BETTER LAWN - - HARVESTS

PUBLISHED PERIODICALLY BY THE
BETTER LAWN & TURF INSTITUTE

VOLUME 24, NUMBER 4

991 WEST FIFTH STREET
MARYSVILLE, OHIO 43040
PHONE: (513) 642-1777
JANUARY, 1978

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GEORGE OSBURN DIES

We are saddened to report the passing of George Osburn, Hercules Chemical, who died in early December. Mr. Osburn served as President of the Institute from 1972 to 1976, and was responsible for guiding its destiny during those important, transitional years. Mr. Osburn will be remembered for his personal qualities of leadership and incisive thinking, and for the great esteem in which he was held by all of us privileged to draw upon his wisdom and great experience. We are most thankful to have had George Osburn at the helm as a motivating force for the Institute.

EXECUTIVE COMMITTEE TO MEET

President Jacklin has called for a meeting of the Executive Committee, tentatively for February 10 at the Drake Hotel, Chicago, (Garden Seed Conference), especially to discuss the possibilities of expanded activities by the Institute in the Southeast.

PRESS KIT READIED FOR FEBRUARY MAILING

Seventeen pages of stories, with a covering letter and three supporting reprints, has been readied for production and mailing by early February. "Handsome New Lawngrasses for Spring" is the lead story, with 24 titles following that range from a length of three pages to fillers of a mere three lines. A story entitled "Lawns Are Efficient" is an effort to blunt recent criticism that having a lawn is an unnecessary extravagance in an age when energy is in short supply and starvation facing many peoples.

INSTITUTE COOPERATES ON SPRING "SUPPLEMENT"

Again this year the Lawn Institute will co-sponsor a spring Lawns and Gardens (the "Supplement"), in cooperation with American Association of Nurserymen, Inc., National Swimming Pool Institute, and The Fertilizer Institute. It is anticipated that the Lawn and Turfgrass Division of the American Seed Trade Association will continue to help share Institute expenses, which, as might be expected, are increasing about 25% for participation this year. William C. Pflaum, The William C. Pflaum Company, Inc., will handle production, as in the past, including mailing to several thousand smaller newspapers and house organs, as well as the better recognized dailies.

The "Supplement" will appear in newspaper format style, so that it can be picked up readily by photo-copying means by smaller publications which do not have garden writers or undertake much editorial type setting. The Institute's

- To be continued

INSTITUTE COOPERATES ON SPRING "SUPPLEMENT" - CONTINUED

contribution consists of 27 titles, ranging from a little over a page in length down to small few-line fillers. Also included are 5 illustrations, for which the Lawn Institute's photographic library will be drawn upon. Pflaum's plans call for first proof by January, production and mailing by January 16. The Institute has ordered sufficient copies so that it can mail one to each of its members, to keep them fully informed about this rewarding publicity measure.

INSTITUTE HONORS DR. REED FUNK

President Doyle Jacklin presented Dr. Reed Funk with the Award of Merit plaque at the "New Jersey Turf Expo '78" meeting of the Rutgers University Turfgrass Association. Mr. Jacklin said that Dr. Funk appeared quite pleased and surprised at the presentation, during the evening banquet. Dr. Funk and his students have been responsible, of course, for many of the new lawngrass cultivars on the market today.

INTERNATIONAL TURFGRASS CONFERENCE PROGRESS

Cooperation continued during the quarter at Institute headquarters, with editing of papers assigned Dr. Schery (as an associate editor) from the Third International Turfgrass Conference held in Munich. Publication of the Proceedings is scheduled to be under way by mid-1978.

OHIO TURFGRASS CONFERENCE

The 1977 Ohio Turfgrass Conference was held in Dayton December 6-8. The Conference was very well attended (registration over 1100), with concurrent "golf course" and "lawn" sessions well attended. The Lawn Institute was represented by Dr. Schery's presentation entitled "Preventive Weed Control; Autumn Treatments Bring Spring Benefits", on which occasion the reprint "The Value of a 'Variety Review Board' for Better Turf" from Seedsmen's Digest was also offered.

PRESENTATION PLANNED

An invitation has been extended from Fernwood Botanical Garden, Niles, Michigan, for Dr. Schery to discuss lawns to a select audience there on Saturday, April 8.

REPRINT POPULAR

We are pleased that the reprint from Seedsmen's Digest, "The Value of a 'Variety Review Board' For Better Turf" has struck a sympathetic chord with the Institute membership. So many member firms ask for added supplies for their own distribution that a second reprinting was necessary within weeks after the first. The reprint will also be included in the spring press kit.

NEW "WORKING GROUP"

A memorandum from Dr. Gerald Coorts, Southern Illinois University, indicates the American Society of Horticultural Science members who had expressed interest in developing a "working group" devoted to Ornamental/Landscape and Turf has now become a reality. Over a 100 charter names are included, the Institute among them. Dr. Coorts asks for suggestions, and further definition of the groups' objectives. This may prove the nucleus of something worthwhile for turfgrass, developing within the field of horticulture.

LIBRARY OF CONGRESS LISTING

The National Referral Center, of the Science and Technology Division, Library of Congress, Washington D. C., will list the Institute for "the information services it is willing to provide to others." The Institute is cited for seed and lawn technology; practical lawn crafts and instructions; cultivars; and economic botany. Its publications, and availability of reprints, are mentioned. This information will be available through the computer service within the library, the United States Congress, and the ERDA. The information is also mailed out upon request, and may be published in "One or more volumes of our series, A Directory of Information Resources in the United States."

IRVING TRUST INQUIRIES

Robert Gulkin, Irving Trust, called October 24, from Number One Wall Street, surveying the lawnseed industry. He was sent information on new cultivars, proprietary rights, and advances that have added respectability to the industry in recent years.

INSTITUTE LITERATURE OFFERED

The Men's Garden Clubs of America lists four lawn titles prepared by the Institute, in its list of literature offered through its "Garden Leaflet Service", available nationally at 5¢ per item. Included are, New Lawngrasses and Their Fertilization, Lawns and Lawn Care, Tailored Turf Care, High Fever Over Cool Lawns.

STORY REPRINTED

The title "Lawn Care - Troubles - Causes - Cures", epitomized and reprinted from Resort Management magazine, was circulated to members in late December. Allen Fagans, Editor of Resort Management, adds his own flourishes (italicized words), and is a great believer in brevity (the length of the presentation did not allow for a great deal of detail). Nevertheless the item might serve as a handy fill-in or envelope stuffer of a general nature.

STORY SCHEDULED FOR DECEMBER

Robert Earley, editor of Lawn Care Industry, has scheduled the Institute's story "Lawns and Turf, In the Old World and the New" for early December. The story compares the lawn products "game" in Europe with its behavior in the United States, and reviews modern cultivars (many of which were on display during the Third International Turfgrass Conference tour last summer). Editor Earley adds, "Thanks again for your work, and you can be sure we will be asking you for other news and features in the future."

STORY FOR OUTDOOR POWER EQUIPMENT

Upon invitation from Bill Quinn, publisher, Outdoor Power Equipment, a story entitled "Lawnseed 'Explosion'" was prepared in late October. The text notes availability of fine turfgrass cultivars, and cites (according to species) those on the VRB acceptance list.

STORY IN AMERICAN ROSE ANNUAL

The story "The Curious Double Life of Rosa Multiflora", with Institute credit, appeared in the 1977 American Rose Annual, published during November.

OHIO TURFGRASS CONFERENCE PRESENTATION

The Institute's presentation ("Preventive Weed Control: Autumn Treatments Bring Spring Benefits"), at the Ohio Turfgrass Conference, which will appear in the Proceedings, discussed several management techniques that aid in weed control, not least of which is the "planting vigorous, dense, decumbent cultivars bred for fine turf", and providing them with "timely fertilization with a fertilizer tailored for turfgrass, especially important in autumn for bluegrass-based lawns." New cultivars are cited for their disease tolerance and vigor, noting how Merion "set the stage" years ago as the first vastly improved cultivar well suited for contesting weeds. Dr. Turgeon's recent experience in Illinois with modern cultivars resisting *Poa annua* (Touchdown and Sydsport especially, Adelphi, Baron, Birka, Bonnieblue, Glade, Majestic, and Nugget at higher mowing height) is also mentioned.

SECOND ARTICLE IN SERIES

The second in the series of articles to appear in American Nurseryman, under the general title of "Guide for Lawns", was completed in early December. This installment has to do with "Starting A New Lawn". The readers are reminded of the familiar lawngrasses which were reviewed in the first installment; and the options for seeding or sodding a new lawn, or renovating an old one are outlined.

AMERICAN NURSERYMAN STORY READIED

The third and final installment of "Guide for Lawns", about caring for the established lawn, was completed and sent to editor, Allen W. Seidel, at the end of December. The story emphasizes especially mowing and fertilization, but touches upon irrigation and pest controls. Readers are reminded of the first installment discussion of grass cultivars, by a boxed insert naming VRB acceptances, and by a final admonition to plant disease-tolerant grasses for effective countering of fungal afflictions.

FOR GOLF SUPERINTENDENT

The story "New Grass Cultivars" was prepared in December for the Golf Superintendent, the official publication of the Golf Course Superintendents Association of America. The story traces the history of early cultivar development, reviews the main breeding consideration behind today's wealth of cultivars, and provides a descriptive list of present Institute cultivars.

STORY INQUIRY

After a telephone visit with Doris Watson, Hercules, Dick Morey, Brantwood Press (Turfgrass Times, Landscape Industry) wrote wondering if the Institute might prepare occasional materials suited to his "professional" audience. The idea is being explored, especially as a possible means for discussing southern winterseeding and fertilization.

REPRINT DISTRIBUTED

The reprint "The Value of a 'Variety Review Board' for Better Turf" from Seedsmen's Digest was offered to Columbus Rose Club members at their December annual meeting, and was well received. Merle Holcomb, of the Chillicothe Campus of Ohio State University, asked for 100 copies which he, as President of the Ross County Rose Club, mailed to his membership and gave out to colleagues.

SPORTS TURF RESEARCH INSTITUTE

John Shildrick, The Sports Turf Research Institute, Bingley, England, writes, "Perhaps - - - you could also enclose a list of your other publications so that we can make sure that our library is up-to-date - - -". This was in response to his having received a copy of the Seedsman's Digest story "The Value of a 'Variety Review Board' for Better Turf", which intrigues the Bingley people. They indicate, "Apart from the interesting technical information, this matter of setting up an appropriate body to look at the results of cultivar trials and decide how best they can be publicized is something which is topical for us and your own procedure may very well give us some useful ideas."

PROGRESS ON LAWN STORY

Fred McGourty, editor of Plants and Gardens (Brooklyn Botanic Garden) reports progress with the story sent him in defense of lawns. This Institute story points out that lawns are ecologically sensible in spite of some recent publicity that they are "wasteful". As of late December "The Alternative To Lawns" was in press, with expected appearance early in 1978.

WORD FROM "DOWNUNDER"

M. Scott Hodge, Director of M. F. Hodge & Sons Pty., Ltd., thanks the Institute for literature relating to turfgrass cultivars. He writes "Your comments are most thought provoking - - -". On Mr. Hodge's point scoring sheet from Australia Adelphi, Nugget and Fylking rate most highly, and he points out, "Our dry healthy Mediterranean type climate here in South Australia offers optimum freedom from conditions conducive to disease development - - - I agree with you that mixtures of grasses, especially the newer cultivars, would be the proper way to introduce them to our sporting and industrial clients".

REQUEST FROM CHEM-LAWN

"We would like to include the data you presented in your talk [Ohio Turfgrass Conference] - - - in some of our winter training programs. Would you please send us a copy of this paper? - - -".

WALL STREET HEARD FROM

"Thank you for your letter of October 25, 1977 and the accompanying articles. The reprints and our phone conversation were most helpful to me in developing an understanding of the lawnglass industry." - - - Robert F. Gulkin, Irving Trust Company.

THE INSTITUTE IS THANKED

D. X. Fenton, an editor for various enterprises (Woman's Day, CBS specials) writes: "Delighted with the story you 'customized' for us - - - it is always wonderful working with a real pro."

APPRECIATION FROM CANADA

"I truly appreciated the information supplied in your 'lawn information kit', and have written my next week's gardening column solely on lawn-care, and based on the information you supplied, - - -", Jack Hinde, Ontario, Canada.

TECHNICAL SECTION

TURFGRASS INFORMATIONAL PROGRAM, AGRONOMY MEETINGS

A broad range of technical papers were presented before the Turfgrass Division, at the Agronomy Society meetings in Los Angeles, November 14-18. A resume follows.

Burns, Georgia, investigated use of sewage sludge for bermudagrass sod production, utilizing sources from both an industrial area and a residential area. The industrial sludge did contain appreciable amounts of heavy metals, which were not concentrated enough to be toxic to the sod, but which could pose a problem were the ground later to be used for food production. The metals did not move appreciably in the soil, and could be removed with a thin layer of soil. In much the same fashion, Clapp et al, Minnesota, found sewage sludge satisfactory for bentgrass and bluegrass growing. Sewage sludge fertilization in Maryland, reported by Angle et al, caused some increase in ground water nutrients, but nothing that exceeded U.S. Public Health Service standards, the sods being grown were bluegrass-red fescue, tall fescue, and perennial ryegrass.

In Nebraska Pederson et al tried to inoculate Park and Nugget bluegrasses with nitrogen-fixing bacteria obtained from wheat fields, without notable success. In Florida high pH (from alkaline water) may cause manganese deficiency in turf, which is best corrected by utilizing acidifying ammonium sulphate as a fertilizer (does better than manganese salts). In Ohio Christians et al tested Merion bluegrass and Penncross bentgrass on sand cultures, and found best quality to come from very high nitrogen and potassium nutrient levels, but low phosphorus (especially with Merion).

Daniel and Roberts, Purdue, gave more details on the Purr-Wick system for putting greens. Rodrigues et al, Alabama, found aerification to increase nematode larvae concentration in the rootzone unless nematicides were applied. In Michigan Rieke and Beard found that generous nitrogen fertilization caused increase of *Poa annua* on northern sandy soils, particularly in competition with red fescue; but somewhat with Merion bluegrass too. Milorganite caused even more *Poa annua* than did inorganic fertilizers. The influence was less marked on the heavier soils of lower Michigan, but spring nitrogen fertilization significantly increased *Poa annua* compared to autumn treatment.

Johnson, Georgia, found that glyphosate was very effective in eliminating winter weeds in dormant bermudagrass, but was injurious to the bermudagrass if applied when it was not completely dormant (the amount of injury corresponded to the rate of herbicide and degree of greenness). Portz, Southern Illinois, attempted to use pre-emergence herbicides in establishing zoysia or bermudagrass cuttings (treated with activated charcoal to reduce phytotoxicity of the herbicide). In most cases establishment was successful, although the activated charcoal tended to reduce weed control by the pre-emergence chemical. Bensulide was too phytotoxic for both grasses, even with charcoal; and simazine was too toxic for Tifgreen bermudagrass. Whatever the spring pre-emergence measures, post-emergence follow-up was adviseable for summer weeds.

Greub and Drolsom, Wisconsin, reported on salt tolerance of grasses. Quackgrass and tall fescue were most tolerant, Merion bluegrass, Astoria bentgrass and Chewings fescues least tolerant. Alkaligrass and Ruby creeping fescue were intermediate. DiPaola and Beard, Texas, investigated st. augustinegrass rooting. Under favorable conditions roots grew as deeply as 4 ft. in 6 weeks, growing over an inch per day (after two weeks), growing 22% more rapidly at night than in daytime. Potassium helped increase root weight but not distribution.

Shearman et al, Nebraska, reported on establishing tall fescue. Spring planting is preferred (because of likelihood of winter injury), but this results in greater weed competition. Siduron used as a pre-emergence treatment is helpful against the

weeds, but is also somewhat deleterious to the tall fescue. The authors suggest slightly increased seeding rates (6 lbs./M) and other attentions, while utilizing light rates of siduron. Reiersen et al, Nebraska, tested pre-emergence herbicides on 10 bluegrass cultivars. Only prosulfalin caused significant injury to the grass. Common-type bluegrasses (Park, Kenblue, Cougar) suffered more injury at high temperatures than did Nugget, Merion, Fylking, and others. The prosulfalin treatment caused increased severity from powery mildew, rust and leafspot on Merion, Nugget, and Cougar cultivars.

Butler et al, Colorado, examined performance of grasses (and legumes) at high altitudes. Because of snow cover, low temperature winter loss does not occur. Various combinations of bromegrass, wheatgrass, and tall fescue did reasonably well, while Baron Kentucky bluegrass was the best of the Kentucky bluegrass cultivars. Taylor and Schmidt, Virginia, tested bluegrass cultivars in the shade. Differences were not consistent, and nothing was really good in dense shade, but Sydsport, Enmundi and Victa were among the more shade-tolerant selections.

Horst, Texas, examined the tenacity of 34 Kentucky bluegrass cultivars under arid, high summer temperature conditions, by repeatedly defoliating the plants and measuring the topgrowth revival yield. Surprisingly, common types, although initially more "productive", were not so "efficient" in the long haul. Horst liked Bonnieblue and Adelphi especially for measured regrowth over a longer span than other cultivars. Dickens and Johnston, Alabama, subjected centipedegrass to various treatments in a search for strains that might show superior survival. As would be expected, heavy nitrogen fertilization decreased hardiness. Karnok and Beard, Texas, looked at 2 bermudagrass and 2 st. augustinegrass cultivars for response to chilling. Floratam showed a significant decrease in photosynthesis from application of gibberellic acid, while other cultivars either did not respond or increased photosynthesis. Chilling injury occurred first and was most pronounced in stems exposed to light.

Almodares and Beard, Texas, investigated methods for measuring thatch; dry weight was as good as anything. Hurto and Turgeon, Illinois, noted that thatch does influence efficacy, mobility and persistence of pre-emergence herbicides. There was some turfgrass injury on thatched bluegrass where benefin, prosulfalin and oxadiazon were used, but not on thatch-free turf. These same authors noted that paraquat, but not glyphosate, had a residual effect on thatch that interfered somewhat with overseeding (paraquat was inactivated by soil, however).

Myers and Busey, Florida, discussed the accumulation of st. augustinegrass as the basis for a breeding program. Meyer, Oregon, noted the seriousness of stripe rust disease on Kentucky bluegrass in the Willamette Valley of Oregon. Johns and Beard, Texas, examined ways for cleaning up petroleum spills on turfgrass, for which sudsing with detergent was generally most effective (if anything at all would work).

Wilkinson, Ohio, reported how much applied nitrogen is lost in a subsequent mowing (if the clippings are collected); up to 47% can be lost, and Chem-Lawn generally advocates leaving the clippings on the lawn. Krans, Mississippi, found that low mowing, but not spiking, helped speed transition from wintergrass (perennial ryegrass) to bermudagrass on southern golf greens. Hall, Virginia, discussed herbicidal removal of wintergrass to speed bermudagrass revival, and found cool-season grass most quickly removed with either paraquat or glyphosate (but application should be made when the bermudagrass is dormant). He is currently recommending paraquat. Busey and Burt, Florida, are looking for better bahiagrasses for roadside seeding (especially drought tolerant types that need little mowing). It is suggested that parental lines be selected which set seed under daylength conditions different than for Florida (to

TURFGRASS INFORMATIONAL PROGRAM, AGRONOMY MEETINGS - CONTINUED

produce a remunerative seed crop farther north), with the seed to be sold in Florida. There has been encouraging experimental use of bahia sod growing on waste product impoundments; such sod seems to hold up longer and root better on the roadsides than does conventional sod.

Ensign, Idaho, checked bluegrass seed yields as affected by open-field burning. Seed yields are reduced more than 30% if hay left on the field is not burned, but reductions were less with various other combinations of removal or burning. Phaneendranath and Funk, Rutgers, reported on germination stimulation by plant growth regulators dissolved in acetone. Germination of freshly harvested bluegrass seed was hastened especially by gibberellic acid, and under temperatures high enough normally to be inhibitory.

Ou et al, Florida, examined the effects of high concentrations of herbicides on the microflora of the soil. With 2,4-D smaller dosages stimulated degradation, but strong concentrations reduced activity drastically for 3 months. Parker and Doxtader, Colorado, studying much the same subject, used isotopically labeled 2,4-D. The herbicide rates were not so high as in the Florida study, but the average time for doubling of the 2,4-D decomposers was only 2.7 days under conditions of the experiment. Decomposition was more rapid in moist soil than dry, and went through a slow initial phase lasting from 1 - 3 months before rapid degradation occurred.

RHODE ISLAND RESEARCH REPORT

The August issue of the University of Rhode Island Turfgrass Research Review, carried a thorough review of the use of activated charcoal for nullifying chemical residues in soil or when mistakenly applied to turf. Dr. Jagschitz lists various chemicals that are generally no problem in preventing seed germination (bentazon; cacodylic acid, dalapon, DSMA, gasoline, and several others that one would suppose to be more lethal). But most crabgrass preventers, and 2,4-D-like materials, can be deactivated with charcoal to make seeding or sodding possible immediately. Heavy oils and several inorganic chemicals are not absorbed by activated charcoal. Jagschitz concludes "Where chemical spill, overapplication or misuse takes place, one can eliminate damage to established turfgrass from some chemicals by using charcoal."

The other discussion in this issue is of limited significance generally because the test material was an antibiotic waste from a Pfizer plant in Connecticut. These wastes used to fertilize a turfgrass seeding proved even better than did regular fertilization with a commercial product (on a monthly basis during the growing season). No other attention was needed for three years. Such treatments are not likely to prove popular; the material must be applied as would be wet manure, rather than gracefully through a lawn spreader.

GLYPHOSATE TREATMENT ENHANCED

Studies by Jordan, Mississippi, reported in the September issue of Weed Science, underscore influence of environmental conditions on the efficiency of glyphosate. Increasing concentrations of glyphosate up to about 1 pound per acre significantly increased bermudagrass control. Warmer temperatures and higher relative humidities increased efficiency (only 40% of the herbicide penetrated the bermudagrass leaf at room temperature and 40% relative humidity, whereas 70% penetrated at 32° C. and 100% relative humidity). The study gives some nice parameters to use for glyphosate rates in controlling bermudagrass, under differing environmental conditions.

AGRONOMY TURFGRASS TOUR

As is customary in conjunction with the Agronomy Meetings, Wednesday, November 16 was devoted to a tour of turfgrass research facilities in southern California.

The tour opened with a visit to the Dodger baseball stadium, currently under renovation following a mobile home show. The grass was originally Tifgreen bermuda, but later overseeded with U-3. Bermuda is the species predominating in hot weather. It is overseeded annually with cool-season grass for winter color (currently being used are 1 lb. Adelphi-1 lb. Parade bluegrasses, with 4 lb. of a fine leaf perennial ryegrass [probably Pennfine]). Thinning, aerification, topdressing, leveling, and so on were all under way.

Another morning visit was to a golf course and condominium development of Castle and Cooke, built upon a landfill. The problems associated with subsidence (as much as 15 ft. annually) are monumental, especially in that irrigation piping is needed to maintain golf course turf. Methane gas accompanying decay has proved lethal to some plantings, and can be offset by using plastic liners where new plantings are made. As little as 5 ft. of topsoil over the landfill suffices, although in some places as much as 30 ft. have been used.

A midday visit was made to the Santa Ana Coastal Field Station of the University of California, where field research for Riverside (and other agronomists) is undertaken. This will be reviewed in greater detail in a moment. Finally the Cal-Turf sod farms were visited, where modern sod production was reviewed. A DuPont net is increasingly being used, which can cut in half the time needed for sod to establish sufficiently for handling. Net installation costs about \$250 per acre, but the cost is felt justified because it doubles production in a given time. Both "warm-season" and "cool-season" sod is produced, the latter now predominating.

A Fylking-Newport-Adelphi blend is used for bluegrass sod, or Fylking-Pennfine for mixture. A Brouwer sod harvester lifts slabs 15 inches wide, 48 inches long, 1/2 inch thick.

At the Santa Ana field station most of the familiar turf-type perennial ryegrasses are under test (the stands established September 25, 1975), at two mowing heights and 3 fertility levels. Under higher fertility (4-6 pounds nitrogen per year) almost all look good, particularly at the higher mowing height (1 1/2 inches). Manhattan and Diplomat were perhaps as attractive as any at time of visit, but other cultivars were not far different.

Difference between bluegrass cultivars showed up a bit more prominently. At this time of year the bluegrasses were pretty good, but their density and fullness of cover at time of visit reflects ability to withstand a hot summer in the southern California climate. Three replicas of each cultivar had been planted (a September 24, 1975 seeding), and Dr. Schery made a rough observational rating on the basis of 1-5 (1 being excellent, 5 being very poor). Adelphi, Parade, Majestic and IS-28 scored best (1+); while Enmundi rated 2.0; and Merion, Baron, Bonnieblue, Glade, Nugget, Sydsport and a few less familiar selections between 2-3. Ram I and Arista were scored 5.0, poorer than common (3.0) or Park (4.0).

A number of tall fescue selections are under test, but visually none appeared any better than 'Alta'. Where perennial ryegrass and Kentucky bluegrass, in various combinations were mixed with tall fescue, the turf was very nice looking, provided enough perennial ryegrass was included (the amount of bluegrass and tall fescue seemed to make little difference; this seeding was November 19, 1975). A combination

AGRONOMY TURFGRASS TOUR - CONTINUED

of 20% tall fescue, 25% Kentucky bluegrass and 55% perennial ryegrass in the seeding mixture looked very good, but the stand was too coarse when ryegrass was left out.

In the bentgrass plantings Emerald was as dense a turf as any, but a lighter green color than most. Sulphur applications were said to help Penncross creeping bentgrass, making it darker green (no visible differences were noted at time of visit). In a bluegrass planting to investigate fertility, bare areas at this time of year indicated *Poa annua* invasion in summer (the *Poa annua* now gone). Apparently most competitive against *Poa annua* were Parade, Adelphi, and Baron among "Institute cultivars".

In new perennial ryegrass plantings, Caravelle was by far the darkest colored, but not a good stand (clumpy). Yorktown was thin; Loretta was good; indeed, there was not a great deal of difference among most of the cultivars, all appearing excellent at this time of year. The same was true of Kentucky bluegrass-perennial ryegrass mixtures at various rates, all looking good and much alike (no matter what the ryegrass percentage, in a range between 0-50%). Other breeding and selection work is being carried on with dichondra, and various southern turfgrasses (particularly zoysia and bermudagrass, but some centipede and st. augustine).

NORTHEASTERN BLUEGRASS EVALUATIONS RECEIVED

Through the courtesy of Dick Skogley, Rhode Island, Bulletin 814, May 1977, was received reporting on "Northeastern Regional Turfgrass Evaluation of Kentucky Bluegrasses 1968-1973". The USDA at Beltsville, Connecticut, Maryland, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and Virginia were involved.

The first section of the 60 page booklet discusses the importance of Merion in initiating the era of improved cultivars, and evaluation criteria used in evaluating the cultivars (many of the newer ones, of course, were not available in 1968, at the start of these evaluations). Obviously, ratings differed slightly at various locations, and according to personal estimates of quality. Interestingly, South Dakota certified and other common types averaged lowest in quality, and of the current commercial cultivars (following after A-34 and A-20) were Birka, Fylking, and Sydsport among the higher ranking (as good as Merion or better).

The cultivars most susceptible and the most resistant to various diseases, to thatch accumulation, and to winter survival are named, under headings that include brief discussion of each disease or topic. Interestingly, no single cultivar was outstanding in all tests in all locations. The booklet ends up with numerous rating tables for individual locations, on a monthly basis. It will be of most value for checking a given cultivar (included in the testing) for a localized region, rather than providing an over-all summary of general worth.

PHENOXY HERBICIDES DISAPPEAR QUICKLY

Two research reports in the September issue of Weed Science emphasize the lack of persistence in the environment of 2,4-D and 2,4,5-T. Work by Norris et al, Oregon, showed negligible amounts of 2,4,5-T six months after an aerial spraying; no penetration of the soil beyond a depth of 6 inches could be found. Radosevich and Winterlin investigated the persistence of both 2,4-D and 2,4,5-T in California chaparral. Results were much the same; a large part of a heavy application was fixed on surface litter (most of which dissipated within 30 days), and none could be noted more than 2 inches in the soil. This should serve as additional documentation of the ephemeral nature of 2,4-D and 2,4,5-T applied in lawn herbicides.

UNIVERSITY OF ILLINOIS TURFGRASS CONFERENCE PROCEEDINGS

Continuing the excellent series of Illinois Turfgrass Conference reports of recent years, that for the 17th Annual Illinois Conference, issued in October, provides much food for thought.

The opening paper discusses leafspot control on Toronto creeping bentgrass, for which Daconil was particularly effective. A second paper deals with selective control of creeping bentgrass, in which a combination of silvex and endothal was effective if used carefully. A third paper showed that lawn thatch can accumulate toxic amounts of herbicides, such as paraquat. A fourth paper discussed pelleted turfgrass clippings for livestock rations, useful when the economics are favorable.

Of more direct interest to Institute members will be Dr. Turgeon's observations about turfgrass cultivars. He found that individual cultivars responded somewhat differently to mowing and fertility regimes. But in general low-mowing and low-fertility favored dollarspot, while high-fertility was conducive to leafspot, fusarium and stripe smut. Low-mowing and high-fertility assured heavy infestation by annual bluegrass. Most familiar cultivars are charted for disease incidence, and "quality" at differing combination of fertilization and mowing height. Nugget and Merion proved moderately resistant to Poa annua invasion, but Pennstar, Fylking and Kenblue were quickly dominated by it, at least under ample fertility. Under low maintenance Birka did quite well.

The next few papers dealt with soil mixtures for golf greens, and will not be commented upon here. Then Portz, Southern Illinois University at Carbondale, discussed his experiences with cultivars and blends in southern Illinois. In general blends did better than individual cultivars. Differences in ratings between cultivars were not great, with Victa, Baron, Aquila, Parade, Majestic, and Pennstar being a bit better than Nugget (the poorest cultivar), Adelphi, and Common. In tolerance to heat and drought Adelphi, Brunswick, Merion and Sydsport were all "very good", Baron and a few others "good", with Aquila, Touchdown, Common, Birka and Newport classed as "pcor".

For the Southern Illinois climatic zone, tall fescue is often the most durable ground cover. Portz likes about 10% of Baron Kentucky bluegrass included (which he states "was the best of the individual cultivars" for this purpose). Pennfine perennial ryegrass rated a bit better than either Manhattan or Yorktown as a companion for tall fescue, but none of the ryegrasses was as useful as bluegrass. Portz also discusses means for keeping southern grasses (Bermudagrass, Zoysia) green and acceptable in this zone.

Engel then discusses annual bluegrass control, Powell the management of bentgrass greens for summer quality, Hiltibran and Turgeon bentgrass response to herbicides in irrigation water (a complete paper, with drawings of 18 aquatic weeds, and recommendations for their control). Then came a paper on the Golf Course Superintendents Association, and a review of Kentucky bluegrass seed production over the last 50 years (Earl Page, St. Louis). Contract turfgrass maintenance (the business viewpoint), bedding plants in the landscape, and control of annual bluegrass in sod production followed. Street discusses management of tall fescue, and Beard writes about investigations begun in England on growing sod rapidly on nets.

Powell suggests fertilizing Kentucky bluegrass quite heavily through the autumn season, very little in late spring, and not at all in summer. Then a final series of papers by Beard, Hurto, Turgeon, Engel, Street and Randall provide something of a "symposium" on the technicalities of thatch formation, its chemistry, its characteristics, and its control.

THIRTY-FIRST NORTHWEST TURFGRASS CONFERENCE

Proceedings of the 31st Northwest Turfgrass Conference, held in Oregon October 5-7, 1977 was received from Executive Secretary Goss. An opening paper by Bill Meyer discussed the turf-type perennial ryegrasses. He noted the leadership of Manhattan and Pennfine, and the continuing excellent record of other cultivars. None of the cultivars are resistant to stem rust, while Birdie and Loretta experience least damage from crown rust. Manhattan and Omega showed good resistance to brown blight, but none of the cultivars great resistance to red thread or Fusarium (apparently inclusion of Kentucky bluegrass in a mixture reduces damage from these diseases). Citation has shown summer heat tolerance. Dr. Meyer suggests no more than 20-30% perennial ryegrass in a seeding mixture with bluegrass and fine fescue. He notes excellent results with the perennial ryegrasses for renovation by the Rogers seeder and with Round-Up chemical knockdown. He feels that the ryegrasses do reasonably well in shade, and are especially well suited under trees for autumn seeding.

Subsequent papers have to do with golf green topdressing, planting of trees on golf courses, correcting soggy spots, personnel management, and taking care of equipment.

Dr. Cook, Corvallis, reported that *Poa annua* can be controlled with endothall used carefully, without serious damage to bluegrass or ryegrass, and even bentgrass (at light rates). Baron, Nugget, Glade, Sydsport, Adelphi, Bonnieblue and Merion bluegrasses were reasonably resistant to endothall; Fylking was more susceptible. Among the ryegrasses Derby is especially tolerant; Pennfine intermediate; Yorktown, Citation and Manhattan less so. About 2 1/2 pounds of endothall per acre seems satisfactory for eliminating most of the *Poa annua* without serious damage to either bluegrass or ryegrass (a lighter rate is needed for bentgrass).

Jim Watson "scolded" the country for not being more serious about water conservation, advancing a number of excellent examples. Law, Washington State, noted no advantage from Biodethatch in elimination of thatch with either bentgrass or bluegrass. He found appreciable phytotoxicity from endothall (and Roundup) in eastern Washington. He noted that among perennial ryegrasses, Pennfine, Citation and NK-200 showed the least shredding after mowing. Goss, Puyallup, presented ratings on 29 bentgrass cultivars managed as for a putting green. Goss and Cook discussed managing Emerald bentgrass to reduce *Poa annua* invasion (invasion is much more severe where milorganite is used than with ammonium sulphate or urea). Goss also discussed slow-release nitrogen tests, response of Highland bentgrass to certain fertilizer treatments (sulphur helps restrain *Poa annua*), and response from several turfgrasses to sulphur applications.

Dr. Ensign, Idaho, investigated snowmold control on bentgrass greens (only Tersan SP in combination was effective). Ensign also reported on turfgrass evaluation in Idaho, noting that Sydsport and Arboretum (among several bluegrasses) greened up early in spring; with Adelphi, Baron, Fylking, Glade, Kenblue, Merion, Touchdown, Bonnieblue, Majestic being medium; Nugget and Prato late. Adelphi, Baron, Fylking, Glade, Nugget, Sydsport and Majestic are listed as having dark green summer color; Baron, Fylking, Touchdown as showing good autumn color retention. Ensign also evaluates cultivars for color under low mowing height, and for leaf texture. There were no major disease outbreaks on the plantings, and all bluegrasses and ryegrasses seem to be persisting well.

SULPHUR AIDS BENTGRASS TURF

Publishing in the Sulphur Institute's Sulphur In Agriculture magazine, Vol. 1, Goss, Brauen, Gould and Orton detail their observations on the use of sulphur in tests on Highland bentgrass at Puyallup, Washington. In general sulphur applications have been quite helpful, in improving growth and density of the bentgrass, and in restraining Poa annua invasion.

Contrary to what is experienced in the eastern United States, annual bluegrass invasion seems to be reduced by nitrogen applications, although both low and high nitrogen rates favor the bentgrass over the Poa annua more than does a middle rate. High levels of sulphur greatly restrict Poa annua, no matter the nitrogen fertilization. Phosphorus generally encouraged Poa annua moderately, and again high sulphur treatments offset this influence. No matter the nitrogen regimen, very high sulphur applications virtually eliminated Fusarium patch attack, which was quite abundant without sulphur treatment (the grass routinely received benomyl and PMAS fungicidal treatments regardless of the nutritional program). The sulphur treatments also helped control algae, earthworm activity, and Ophiobolus patch disease.

Although the climate at Puyallup is not typical of most of the United States (prolonged winter wet season, and relatively mild temperatures), and the fertility conditions were exceptionally high (typical of golf greens more than ordinary turf), nonetheless the influence from applications of sulphur seems truly amazing. Up to 5 pounds of sulphur/M could probably not be used on many soils without adverse effects on pH.

HOLDING BLUEGRASS SOD

The October issue of Western Landscaping News tells of a test conducted in California (Pacific Sod Farms) in which bluegrass sod was lifted and kept for several weeks free of a soilbed, yet performed nearly as well as newly lifted sod when replanted. The sod was not kept rolled, however, in which case it might have deteriorated in a day or two. It had been rolled and handled in conventional fashion until left on a paved surface where it was exposed to light, air, and regular watering. That portion sprayed with a growth retardant grew less tall, but displayed no marked advantages. The report concludes "On the 39th day, both areas were inspected for color and growth, but had a good dark green color and you could not tell the difference between the two". It is apparent that bluegrass sod can be kept free from soil contact for a number of weeks if left exposed to air and sunlight, and watered regularly.

ARSENIC VOLATILIZED

Research by E. A. Woolson, Beltsville, reported in the September Weed Science, tells of significant volatilization into the air of organic arsenical compounds often used for selective weed control and general knockdown of turf. Within 160 days 18% of cacodylic acid and 12.5% of MSMA were recovered as gases, identified as dimethyl- and trimethylarsine. Obviously all forms of arsenic do not remain fixed in the soil, but undergo recycling that includes gaseous intermediates.

WEED CONTROL IN THE SOUTH

Johnson, Georgia, reports in the July-August Agronomy Journal, that only one herbicide was effective for controlling all winter weeds in bermudagrass turf. Profluralin stopped all seven of the weed species considered in the research, (including spurweed, Soliva, increasingly important in southern turf.) Even so, Johnson concludes that it may be necessary to apply mixtures of herbicides for broader spectrum weed control in turf, and not rely upon a single product.

BENTGRASS GERMINATION

Toole and Koch, Beltsville, report in the September-October issue of Crop Science on "Light and Temperature Controls of Dormancy and Germination in Bentgrass Seed". Most bentgrasses, including Emerald behave similarly, but Highland was a maverick. In general incubation at 15°C. for 16 hours alternated with 25°C. for 8 hours daily gave maximum germination. However, Highland required 1-2 hours at temperatures from 30° to 40° C., alternated with 23-22 hours at 15° C., plus light, for optimum germination. Red light was generally required for germination at optimum temperature; and was obligatory with some varieties.

TECH TURF TOPICS CONTINUED

The third issue of Tech Turf Topics by the staff of "Virginia Tech" (VPI) was issued in mid-November. It carried articles on preventing injury to frosted turf, using glyphosate in turfgrass renovation, recognizing the effects of soil acidity, discussing the planting of shrubs and trees in autumn, and reviewing nitrogen fertilization. The bulletin is a nice 14-page Extension release, popularly presented in review form rather than reporting novel research.

ECOLOGY DISRUPTED

A research report by Jackson and Watson in the October-December Journal of Environmental Quality, tells of the influence of emissions from a lead smelter in southeastern Missouri. Heavy metals, in a transect downwind from the plant, are gradually causing disruption of litter decomposition and nutrient translocation. This can be regarded as substantiating evidence that heavy metals (as might be fungicides applied to a lawn) could depress decomposer-organism communities and result in an intensified thatch problem.

NUTSEGE CONTROL

Bingham, Virginia, reports in the November issue of Weed Science on tests with various herbicides for controlling yellow nutsedge. Cyperquat provided safe selective control with Kentucky bluegrass, perennial ryegrass and red fescue. Under certain conditions perfluidone also successfully controlled nutsedge. Bentazon (Basagran) was less effective than either of the foregoing; it did not injure Kentucky bluegrass, but required split applications for effectiveness.

CROPS AND SOILS QUOTES INSTITUTE

Crops and Soils, an American Society of Agronomy publication, quoted the Institute at length in its March issue. The title was "Turf-Fertilization Necessary in Proper Lawn Care". Two tabular listings of bluegrass cultivars are given, showing ratings (in Ohio and Connecticut) under law as compared to adequate fertilization.

The text reads, in part, "Robert W. Schery of the Lawn Institute says economical cultivars like Highland colonial bentgrass require less fertilization than do those used for golf greens - - Bluegrasses, turf-type ryegrasses - - do well according to Schery - -". Specific examples are cited, and an admonition given not to neglect lawn feeding.