

B E T T E R L A W N - - H A R V E S T S

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F I R S T I N T E R N A T I O N A L T U R F G R A S S C O N F E R E N C E

T H E F I R S T I N T E R N A T I O N A L T U R F G R A S S C O N F E R E N C E

Perhaps the activity of greatest significance during the quarter, was representation of the Institute at the First International Turfgrass Conference in Harrogate, England, and on the subsequent tour of research facilities on the continent, in the person of its Director, Dr. Schery. Such participation is not only rewarding for the information and contacts developed, but is a "must" for an organization purporting to be in the forefront of lawn activities. We are indebted to the leadership of President Carnes in finding the necessary additional sponsorship to defray most of the costs of this trip. A good many pages of this issue of Harvests deal with the conference, and as yet the final Proceedings (that incorporate discussions and remarks from the floor as well as papers presented) is still to come. We will in this issue, however, try to review for members various presentations showing the scope and breadth of interest of the conference.

An August 19 memorandum to sponsoring groups provided some general observations on turfgrass conditions and trends shaping the European market. A condensation of that memorandum is perhaps appropriate to begin this issue of Harvests.

Grasses and weeds similar to those found in the northeastern United States prevail in Europe, giving relevance to observations made in England and the continent. Details of weather, and especially use habits, are quite different however. In the benign, insular climate of the British Isles practices can be tolerated would result in failure in the United States, -- especially very low mowing and a low level of fertilization. Customs on the continent are a bit more like those in the United States; Holland, especially, seems the center of influence there as well as a turf breeding center.

Poa annua is everywhere the most prevalent grass, a weed, of course, where it is not wanted. In England the bentgrasses seem to have the best chance for permanently contesting Poa annua, although fine fescues are widely planted, too (although generally not persisting for many years, serving mainly as "nursegrasses" in the early stages of turf development). Everywhere Kentucky bluegrasses and perennial ryegrasses are mainly used in the relatively high-mowed athletic field plantings. Imports into Europe from the USA would seem chiefly to involve bentgrasses, followed by fine fescue, perennial ryegrass and Kentucky bluegrass. The market as a whole should be mildly expansive, but production from areas other than the United States also perhaps expanding.

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The trend is to lists of registered varieties, only these being permitted for sale within a country. This scheme is especially advanced in Holland, and other Common Market countries appear to be following the lead. A variety is eligible for the listing after it has been proved out in growing tests (taking about 2 years), showing it to be genetically homogeneous, true-to-type and identifiable. There are no performance requirements for the registered list, but a second recommended list is offered in many countries reflecting judgment of the experts. Not many of the current North American varieties are on the registered lists as yet, and some may not qualify (viz. hybrids which segregate such as Penncross, or synthetics such as Pennlawn). However special exceptions can be made, and qualifications are still in the formative stages (especially for Kentucky bluegrasses and bentgrasses).

By-and-large turfgrass research in Europe seems a little behind that of the United States, two exceptions perhaps being the mechanical management of sports stadia in Sweden, and breeding work in Holland.

INSTITUTE PRESENTATION AT INTERNATIONAL TURFGRASS CONFERENCE

Although the Institute was late in "signing up" for the First International Turfgrass Conference, we were pleased to have found a place on the program for presentation of the topic Turfgrass Seed Production in the USA. An attempt was made to underscore the many procedures that go to insure a specialized, high-quality product on the world market. The presentation seemed to be well received, and was enhanced materially by the loan of slides (supplementing those Dr. Schery had accumulated), particularly from Doyle Jacklin, on production in the Pacific Northwest, and from Oregon State University concerning the technology of seed gathering and cleaning (Dr. Jesse Harmond). There was opportunity to stress the various requirements and historical developments within the United States, pointing out that there is still value to some of the "old fashioned" genotypes such as are reflected in Kenblue Kentucky bluegrass for relatively unattended turf and in certain climatic belts. Questions and discussion from the floor will be more fully outlined when the final Proceedings are issued. Following is the "summary" that appeared with the paper as it was included in the volume of papers given registrants before the conference for their reading and examination ahead of the presentation.

"Turfgrass seed production in the USA has grown into a specialized industry requiring considerable skill, capital, and established trade channels. Today it centers especially in Oregon and Washington. Careful growing by the farmers is increasingly important, with preventive weeding in the field to provide contaminant-free seed. Backing up good field practices is experienced seed cleaning meticulously done by responsible handlers in established producing regions. Some contamination does occur, especially with rough grasses (charts 3 and 4). A check of numerous lots of quality species showed over 40% without any foreign seeds, however, and of those containing foreign seed (both weed and crop) few exhibited quantity or types to become persistent pests in the lawn (charts 1 and 2). The burgeoning sod industry has brought demand for especially high quality, but there are other uses where differing standards are appropriate (such as for the roadside)."

THE FIRST INTERNATIONAL TURFGRASS CONFERENCE, HARROGATE, ENGLAND.

The formal presentations at the First International Turfgrass Conference were given in Harrogate, England, July 15-18. The system followed was to have resumés of all talks prepared beforehand (in English), and a bound volume of these was issued to each registrant. This volume proved to be of portfolio size, and over an inch in thickness; obviously we can only touch lightly upon its contents here. Included was the Institute presentation on Turfgrass Seed Production in the USA, a summary of which is given elsewhere in this issue. Mention of some of the presentations may prove of interest to Institute members, more to provide an indication of turfgrass interests worldwide than to provide specific technical information for use locally in the United States.

Vos and Scheijgerond, Holland, spoke about the national testing at Wagenin-gen. Bentgrasses have proved very aggressive on sandy soils, but have not withstood wear well. Fescues have been best on clay soils. Perennial ryegrass and Kentucky bluegrass have been best for wear. The authors lean to mixtures rather than monoculture, and mention the registered list of "stable new creations" from which suitable blends can be devised. Each species, as it performs in Holland, is characterized. The official position is a plea for use of "good varieties".

Aldrich, Cambridge, England, reviewed the testing procedure used by the National Institute of Agricultural Botany, mainly related to ryegrass varieties for agriculture. Findings on persistency, winter hardiness and disease resistance have pertinency as well for fine turf. The Aberystwyth S.23 perennial ryegrass, widely recommended in England and Europe nowadays, rated among the best of the varieties under test.

Bogdan, Kenya discussed lawn plants for that African country. Introduced warm-season species are playing some part. Daniel, USA, outlined considerations in evaluating turfgrasses. The "ideal" bluegrass was theorized.

Eschauzier, Holland, reviewed turfgrass breeding in the Netherlands. There are 51 registered Dutch cultivars, over half of which have also been accepted on the registered lists of other countries. Colonial bentgrasses and fine fescues are favored; perennial ryegrass "belongs more and more to the past". Bluegrass is considered coarse by European tastes, but interest in it has expanded tremendously for use in sports fields and because of the foreign seed market. Breeding techniques are enumerated. A good indication of Dutch opinion.

Entrup, Germany, indicated that breeding of turfgrasses has been backward in his country because until recently there was no protection given new varieties. The enumeration of species for particular types of use is not greatly different than for Holland and elsewhere. Currently under test for variety registration (protection) are 22 cultivars. Keen, USA, reviewed the grasses used for planting in border states climate in the United States. He felt bluegrass was best for partly shaded areas, and Kentucky 31 tall fescue where coarseness and high mowing are not objectionable. Langvad, Sweden, spoke of turfgrass breeding and testing in his country in general terms. He felt that the turf timothy, Evergreen, was an outstanding example of breeding endeavor.

Shildrick, England, spoke about the testing at Bingley, concerned mainly with perennial ryegrass, fine fescue, Kentucky bluegrass and bentgrass. Concern is chiefly with methodology rather than cultivar performance, although ratings are given for ryegrass persistence (S-23 and Melle led at ½ inch cut)

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and Fylking led bluegrasses in snowmold resistance. Another chart indicates that Britain utilizes about 3½ million pounds of perennial ryegrass annually, nearly 4 million pounds of fine fescue, and 1 million of bentgrass. About one-fifth of the total consumption is for fine turf as contrasted to agriculture.

Davis, USA, discussed turfgrasses for the cool-humid areas of the United States. He felt that fine fescue sometimes dominated bluegrass in combinations of these grasses, and that bentgrass usually dominated bluegrass. Composition of stands can be altered by cultural practices. Kamps, Holland, reviewed tests with a sports field mixture subjected to mechanical simulation of play. He found perennial ryegrass and timothy to be most resistant, bluegrass medium, fine fescue and bentgrass least resistant. He felt bentgrass to be disadvantageous because its aggressiveness caused it to dominate mixtures early, while later it could not endure sports field play.

Schmidt, USA, discussed overseeding dormant bermudagrass for winter turf. He preferred Pennlawn fine fescue to annual ryegrass for spring transition, felt bentgrasses were a little slow to become established in the autumn, and thought *Poa trivialis* to be inferior with the approach of hot weather. Good results have been had by mixing fine fescue and perennial ryegrass, and bensulide applied 30 days before overseeding restrained *Poa annua* without damage to the seeded grasses. For golf greens he suggested overseeding at approximately a ton per acre of either fine fescue or perennial ryegrass, bentgrasses and bluegrasses about ½ this rate.

Eisele, Germany, spoke of the inadequacies of evaluation of turfgrass because of the history of testing it according to agricultural standards. He referred to and handed out copies of the Institute story Lawn Seeds and Lawn Weeds. Dr. Schery's presentation in behalf of the Institute followed immediately behind Mr. Eisele, complementing nicely discussions of quality lawnseed production.

Jenson, Sweden, spoke about specifications for turfgrass soil, particularly as related to sports fields in Sweden. This is somewhat similar to the golf green synthetic soils in the United States. On the later tour Mr. Janson conducted the group to stadia where various soil treatments (including soil heating and cooling, as well as soil covering) were practiced. An illustrated booklet (in English) on this has been sent to all conference participants from Stockholm. Bengueyfield, USA, reviewed the USGA specifications for golf green construction. Keen, Kansas, discussed his work in which fine sand has sustained the most traffic-tolerant experimental greens in Kansas. Henderlong, Ohio, discussed use of sintered fly ash as a soil modifier, feeling that this had possibilities. Werminghausen, Germany, mentioned polystyrene for mixing into playing field soils.

Escrutt and Legg talked about fertilizer trials over a 30 year period at Bingley, England. Escrutt stressed that there are many variables, and conclusions difficult to make. He has noted the acidifying influence of ammonium salts, which he felt discouraged *Poa annua*, disease and weeds. Nitrate and urea had somewhat the opposite effect. Potash showed no benefit for 20 years. These and other observations related to specific tests which are cited. Many of the fertilizer materials (viz. dried blood, bonemeal, guano, hoof and horn meal, etc) are not available in the United States.

Schmidt, USA, recommended nitrogen fertilization to coincide with seasons of carbohydrate build-up. Davis, USA, felt that tissue analysis was not yet a

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satisfactory tool for analysing turfgrass nutrition. Hansen, Germany, noted the overriding importance of nitrogen in turf fertilization, and noted better weed control with mineral as compared to organic nitrogen. Rieke, USA, mentioned turf growth under intensive fertilization, and the leaching of nutrients.

Beard, USA, discussed winter injury to turf, often due to desiccation or disease as well as low temperature. Lush turf is more apt to experience winter injury than that not excessively hydrated. Bentgrass and *Poa trivialis* were listed as having excellent low temperature hardiness, Kentucky bluegrass as good, fine fescue and annual bluegrass as intermediate, ryegrasses poor to very poor. Daniel, USA, discussed soil warming tests in the USA. Escritt, England, spoke of a successful soil warming installation in Edinburgh, Scotland. Janson, Sweden, spoke of the extensive investigations in Stockholm (booklet published), enlarged upon by Langvad, also of Sweden.

Watschke and Schmidt, USA, indicated that bluegrass cultivars doing best under warmer temperatures showed higher carbohydrate levels and lower nitrogen absorption. Bluegrass from warmer climates (Kenblue) performed better under high temperature than cultivars from cooler areas (Pennstar, Nuggett). Simmons presented for a Scotts group a review of growing several species under plastic panels that transmitted different light spectra; 50 percent of full sunlight should be acceptable under blue-transmitting plastic, but perhaps 70 percent under gray. Beard, USA, emphasized that factors other than shade usually govern grass survival, such as tree root competition, disease, etc.; in Michigan, under intense shade, after 3 years, fine fescue gave the best quality turf, followed by *Poa trivialis*. Unexpectedly, a 50-50 combination of fine fescue with Kentucky bluegrass proved better than fescue alone or even mixtures with a high percentage of fescue. Wood, USA, found fine fescues most tolerant of low light, Golfrod the most tolerant variety under very low light intensity (not significantly different from Chewings, Pennlawn, Illahee, etc., under medium light intensity).

Madison, USA, discussed soil relationships to irrigation. Watson, USA, the prevention of golf green dying out. Skirde, Germany, reaction of turfgrasses to watering (often reduced root growth). Bentgrasses showed more response to watering than did perennial ryegrass, Chewings fescue and Kentucky bluegrass. Weed invasion was greater under watering, and this varied according to variety (much greater, for example, with Chewings fine fescue than with Highlight, or with Newport bluegrass as compared to Merion).

Freeman, Florida, reviewed the abundance of disease on southern grasses in the United States. Escritt and Woolhouse reviewed turf disease in Britain. Preventive treatment is not undertaken in Britain because of cost, and because of fear that resistant strains of fungi will build up, or beneficial soil microflora perhaps be interfered with. Emphasis is upon breeding disease-resistant varieties. Goss, Washington, related fertilizer elements to disease. Langvad, Sweden, indicated resistance to leafspot was of primary importance in selecting bluegrasses.

Bingham, Virginia, spoke about weed control on golf greens in the United States, and mentioned the use of activated charcoal to counteract pre-emergence herbicides. Daniel, Indiana, talked about weed control in the United States in general. Soper, England, indicated that ioxnil and bromoxynil are safe to apply to turf from the 2-leaf stage onward, giving good control of Veronica. Switzer, Canada, reviewed conventional ways for controlling broadleaf weeds in North America.

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Watson, USA, discussed the fundamentals of mowing. Boeker, Germany, discussed use of growth retardants on turf, often combined with a herbicide. Madison, USA, noted the greater tolerance to mowing stress in the favorable climate of northern Europe. He commented upon minimum conditions for plant population increase and size for any particular set of circumstances. Cornman, New York, reviewed the state of knowledge on thatch.

Bengeyfield, USA, reviewed irrigation and soil compaction problems on golf courses. A group of Michigan state researchers discussed commercial sod production. Van der Horst, Netherlands, outlined proper management for sports fields in his country. He was especially concerned with drainage. Stewart and Adams, Wales, reviewed the special soil problems involved in a cricket pitch. The soil condition is really more important than the turf, which is gradually worn away during play.

Grimm and Knolle, Germany, discussed the use of pelleted seed. Moser, Ohio, reviewed rhizome production of Kentucky bluegrass as it relates to sod formation. Rhizome production is markedly increased under a long photoperiod. High temperatures are inimical to rhizome production, and high nitrogen levels reduce rhizoming (but increase tillering). Low mowing reduces rhizome growth. Fylking produced slightly more rhizomes than did Merion or Windsor in Ohio tests.

Roadside and sports turf feeding was discussed in England, Scandinavia, and North Carolina (Gilbert). Boeker, Germany, noted the changing attitudes in his country, to limited mixtures pinpointed to the needs from broadly based "shotgun" seedings containing just about everything available. In Germany the highway people have tended to favor woody plants over grass until just recently, theorizing that deeper roots would anchor the soil better.

Mitchell and Morris, Fisons, discussed fungicide screening in England. Later, the tour was shown the mechanized way in which this is accomplished, involving small boxes of sod inoculated with the disease, mechanically subjected to treatments and mowing. Fisons also screens herbicides, and has found that generally mixtures of dicamba, 2,4-D and MCPA control most of the weed pests in England. It is evident, however, that the general attitude in Britain is to tolerate small weeds in the turf much more than is the custom in the United States.

A group of Minnesota researchers reviewed chemical regulation of turf-grass growth. In general it was felt application of a growth regulator cost as much as two mowings. Growth retardation required use of a herbicide at the same time for satisfactory appearance. There was differing response by species to treatments with MH-30, and some difference in disease manifestations. MH-30 gave an advantage to competitive weeds over the grass. There was not much in this report to indicate practical advantage from the use of growth regulators.

TOUR IN ASSOCIATION WITH FIRST INTERNATIONAL TURFGRASS CONFERENCE

Conferences are valuable for becoming acquainted with personalities engaged in research and education, but it is on-the-spot inspections that come with the tour which really add meaning to the discussions. We are pleased that Dr. Schery was able to accompany the tour group inspecting research and use locations for

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TOUR (Continued)

turfgrass in the British Isles and northern Europe, following the First International Turfgrass Conference at Harrogate, England.

First significant stop of the tour in England was at Bingley, where the Sports Turf Research Institute has what are probably the most extensive testing grounds in the country. Next the tour moved on to Scotland, where the famed first golf courses were "invented", notably St. Andrews. Rugby and soccer grounds were also inspected in the Edinburgh area.

The tour returned to southern England for visits in the Cambridge area, especially very hospitable showing by Fisons (chemicals and fertilizers) and Ransomes (mowing equipment). The famous Newmarket racing grounds was visited, as well as several stadia and golf courses in the London area, including the Wimbledon tennis courts. In all of these areas special attention was paid to variety trials, which typically included bluegrass, perennial ryegrass, fine fescues and bentgrasses. In most instances Dr. Schery obtained slide pictures which can be shown members at a later occasion.

The tour next continued to southern Sweden, where the Weibull activities were thoroughly inspected, and various golf courses in the area visited. The group went on to Stockholm, where sports stadia were reviewed, including the technically advanced attempts at "climate regulations" of the turf (cooling, heating, covering, etc.) so that year around use of the stadium is possible, with quick change from winter activities (primarily ice hockey) to summer ones (primarily soccer). The tour continued on to Germany for inspection of the variety trials at Giessen, and then those having time mostly made stops in Holland visiting with the several important seed firms there.

CONFERENCE WINDUP

The following letter was received from Dr. J. B. Beard, Chairman, First International Turfgrass Research Conference:

"Dear Bob: The First International Turfgrass Research Conference held in Harrogate, England is now history. I thought it would be appropriate to report to the nine North American turfgrass industry representatives that made donations to defray the conference organizing expenses.

"There were 81 turfgrass researchers and educators in attendance from eleven countries including Japan, New Zealand, Poland, Czechoslovakia, Canada, and the United States, as well as most of the European countries. There were 30 representatives from the United States. The range of topics discussed at the meeting is best illustrated by a review of the program. The main theme of the meeting was the improvement of communications among turfgrass researchers and educators from throughout the world. This objective was successfully met with a formal organization of international turfgrass researchers and educators being formed and plans initiated to hold a second meeting in four years, 1973, somewhere in the United States."

POTPOURRIPENNSYLVANIA NURSERYMEN'S ASSOCIATION

Dr. Schery was invited to speak before the W-1 Meeting of the Pennsylvania Nurserymen's Association, in the Pittsburgh area, on September 11. The meeting was held at the Valley Brook Country Club, and included presentations by the associate county agent, a sod producer and a landscape contractor as well as by the Institute. Dr. Schery's assigned topic was "New Considerations in Lawn Management and Construction", in which prominent lawngrasses were discussed at length. Three reprints were distributed to those attending: Lest Hunger Haunt Your Lawn, Modern Lawn Maintenance, and Lawn Thatch.

The program was very well received, with questions from the floor that eventually had to be cut out by the moderator for lack of time. Representatives from Pennsylvania State University were present for participation in the discussions. The associate county agent, Mr. Jack Paules, reviewed lawn maintenance procedures for autumn in an introductory presentation preceding Dr. Schery's appearance. After supper Mr. Cecil Collings reviewed Lawn Construction from View of the Sod Producer, and Ritch B. Skelton Lawn Construction from View of the Landscape Contractor. Attendees were chiefly garden center and landscape personnel who employ field crews for property maintenance in the western Pennsylvania area. It is worthwhile for the Institute to contact such individuals from time to time, and learn of their thinking.

PRESS KIT USAGE

Because the Institute no longer engages a clipping service to monitor press kit usage, we are especially grateful to Mrs. Rush for scanning the Columbus, Ohio Dispatch on Sundays, to spot pickup of Institute materials. First of the season was noted August 17, The item gives full credit to the Institute, excerpts from which are here cited:

"We recently received the autumn press kit of the Lawn Institute --- Director Schery says ---- 'Autumn is an excellent time in bluegrass country for seeding, ---' The story then recites grasses by name and variety with brief mention of their cultural needs. "Recommended varieties of fine fescues include: Chewings, Illahee, Pennlawn, Highlight and Rainier. They are old favorites -- and they are economical." --- " --- the most satisfactory seed for most purposes is a blend of two or more varieties -- for shady areas a higher percentage of fine fescues than for full sun" --- " --- for an attractive lawn only fine-textured bluegrasses and fescues should be sown." -- "The Seal of Approval of the Lawn Institute is a guarantee that the seed mixture contains an adequate amount of grasses that are long-lived, able to spread and attractively narrow-leaf." The story concludes with a resumé of seedbed preparation.

SPECIAL PRESS KIT MAILING

Besides 900 press kits mailed to regular recipients, multiple copies are distributed through certain state extension offices. These were distributed July 29.

RUTGERS UNIVERSITY RESEARCH

In late August Dr. Schery had opportunity to visit Rutgers University, state university of New Jersey, for discussions with Drs. Engel and Funk. It had not been possible to witness performance of turfgrasses along the eastern seaboard for 2 years, and the Rutgers' visit was doubly useful in that the impressions of the research people were heard concerning the National Turf Field Day at Beltsville, Maryland in early August.

This has been a year of fairly generous summer rain in most parts of the northeastern United States. As a consequence Kentucky bluegrasses have looked exceptionally good, not prone to summer dormancy. On the other hand it has been disadvantageous to fine fescues grown in the open, which turn off-color and with irregular survival under a combination of standing water and heat. It was said that at the National Turf Field Day in Washington, D.C. only one fine fescue looked adequate, that a selection from Alaska. At Rutgers there was a gradation from fairly good fine fescues to failures, a summer for "separating the sheep from the goats". Rutgers does not have a great many bentgrasses, but the weather this summer has been good for properly managed bentgrasses.

Rutgers is widely recognized as the leading bank of bluegrass germplasm in the United States, -- indeed, almost the sole state university with a plant breeder devoting his full time to turfgrasses. Through the years Dr. Funk has collected many bluegrass sources and has narrowed the field down to several elite sources of breeding material which have now been extensively crossed to give a wide variety of New Jersey coded selections. Most of them look very good in the test plots.

This fundamental work, properly the function of a public plant breeder, has now reached the point where the selections may be of some public use. Dr. Funk and Rutgers have accordingly arranged for their further development into commercial varieties: seed production qualities are being investigated by a number of commercial firms and groups, including many Institute members. It can be presumed that in the years ahead ways will be found to achieve economical seed production of the better-performing among these selections, and that public benefits from the New Jersey breeding program will be achieved through the marketing of various selections now being optioned to growers and seedhouses in the United States on a modest royalty basis. To the extent that space is available, the Institute is planting several selections recommended by Dr. Funk as most likely to have commercial success; we will thus have some experience behind us on the elite bluegrasses "of the future", which will doubtless be marketed in the years ahead under various brand designations.

It is interesting to speculate what the influence will be upon the bluegrass seed market. General experience indicates that the better performing selections are generally the poorer seed yielders. It remains to be seen whether skillful growing in the Pacific Northwest can overcome a natural inclination to low seed yield! Even so, it would seem that there must be an increase in the price of bluegrass. The public seems ready and willing to accept higher prices in exchange for improved performance; if these New Jersey selections live up to their promise they would certainly merit a premium price.

In discussing the response of bluegrass cultivars with Dr. Funk, it was agreed that possibly the most effective way to use new strains would be in

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RUTGERS UNIVERSITY RESEARCH - Continued.

combinations of several compatible types. Since no single bluegrass is perfect in every respect, and likely to fall before some new disease mutant, the well-known advantage of seed blending suggests itself. Possibly in the years ahead the New Jersey selections will make their greatest contribution as components of seed blends. At the time of visit differences could be noted among the varieties presently commercially available and New Jersey selections, but these differences were largely a matter of color and taste; all were growing well and performing excellently. Of the commercial varieties Fylking, Pennstar, some of the Warren A selections and Sodco (or Anheuser) were among the best. Nugget, still experimental, looked excellent. Delta was poor, as were some of the European bluegrasses. The group of American natural Kentucky bluegrasses, though satisfactory, is never the equal of the highly selected Rutgers selections under the management practiced there.

Among the fine fescues not a great deal of difference showed at the "upper" end of the scale, with Highlight, Pennlawn and other familiar types looking passably well, especially where drainage was good. At the "low" end of the scale were some experimental types and introductions from Europe, of which Ruby among the named varieties had suffered especially heavy damage this summer.

Perennial ryegrasses did not look very well at time of visit, but work continues under Dr. Funk towards development of still newer combinations that may prove superior to Manhattan. However, in climates where bluegrasses grow so well, Dr. Funk admits there is little cause for using perennial ryegrasses. Their usefulness would be confined mostly to marine environments with porous, sandy soils.

As to turf management, Dr. Engel reports no great changes in Rutgers' recommendations. There is increasing concern about pesticide usage, but fear that there may be emotionalism and over-reaction against pesticides that will hurt both agriculture and gardening. It is still noted that where chlordane was applied heavily some years ago, that the turf suffers in summer. Funk wonders if this might not be due earthworm restriction there, with less loosening of the soil by worms causing the grass to suffer from drought and compaction in summer. Disease control with the new systemics such as Benlate has been encouraging, but it is felt that the high cost of such applications will limit the general public usefulness.

MORE ON GRASS-TREE COMPETITION

Whitcomb and Roberts reported to the 66th Annual Meeting of the American Society for Horticultural Science upon "Tree-Turfgrass Interactions". When Kentucky bluegrass was established before tree roots grew into the soil mass, tree roots production was reduced (at least with silver maple); the grass was not bothered. But when Kentucky bluegrass was seeded where tree roots were already well established, seed germination was reduced 29 percent, clipping yields were reduced as much as 30 percent, sod yields were reduced 40 percent, and grass root yields were reduced 59 percent (and the grass root system became very shallow).

AMERICAN POTASH INSTITUTE

Dr. Conrad Kresge, area representative for the American Potash Institute, stationed in Columbus, Ohio, called upon the Marysville office in August. Dr. Kresge was formerly with the University of Maryland. The visit provided opportunity for better coordinating activities, and Dr. Schery was especially pleased to have chance to review the excellent slide series the American Potash Institute offers on lawn establishment. Forty slides with accompanying script are offered, a set available for \$8.00 from the Atlanta office. In that there has not been great demand for the Lawn Institute sequence of slides compiled some years ago (still available), we have not undertaken revision and up-dating. It is good to know of the availability of a similar set offered by the American Potash Institute, in case there is occasion for referral. Fortunately, in lawns, all grasses look much the same, and it is more difficult to engender "excitement" in a slide series than would be the case with colorful gardens of flowering plants or scenic views.

PYTHIUM FUNGICIDES RECOMMENDED

Pythium has become one of the most troublesome diseases in the East and Southeast, especially on golf turfs. Freeman and Meyers, Florida, discuss Control of Pythium Blight in the May issue of the Golf Superintendent. Dexon (Chemagro) has for the last few years been the specific for pythium, but it is joined now by Terrazole (Olin Matheison) and by Demosan (DuPont), which the authors find equally as effective if not superior. Mallinckrodt has a formulation of Terrazole under the code MF 344. Preventive fungicidal application is recommended, whenever weather conditions are such as to encourage the disease (heat and humidity). For northern grass overseedings late planting is recommended if fungicide application is not possible. Pythium is one of the main causes for failure of winter-seeding?

OVERSEEDING BERMUDAGRASS

The title of a story in the September Weeds, Trees and Turf by Juska, Hanson and Hovin is the intriguing For Winter Color Overseed Bermudagrass. This should stimulate some thought about combinations of cool-season and warm-season grasses in border states, perhaps with annual overseedings to provide winter color. The text of the story has reservations that the title does not imply. Some of the overseeded grasses did not establish well, and several were not very long lasting. Poa annua was a failure. Even Merion bluegrass, the most durable and most attractive, suffered demise in the third year due to an "unknown fungus". In the overall rating Merion bluegrass ranked first, followed closely by tall fescue and fine fescue, and then ryegrass.

FROM AN AP FRIEND

The following was received late in September:

"Please change my Associated Press garden news address from ---. We have bought a home in Hudson, where the lawn is twice as large, twice as rough and 8 times as weedy. So here we go again, like a pioneer. Cheers."

Earl Aronson

GOOD ADVICE

The Cooperative Extension Service of New York State, in its Nassau County release of August 29, advises These Seed Suggestions. "Selecting a seed mixture for a lawn depends --. For areas in full sun with normal moisture use at least 55 percent Kentucky bluegrass in the mixture along with red fescue and a small percentage of improved ryegrass. For dry soils in sun or shade use at least 65 percent red fescue in the mixture along with Kentucky bluegrass and a small percentage of improved ryegrass. It is further suggested that several strains be used in making the individual percentages in the mixtures. -- A diversity of varieties provides a higher quality lawn." The Nassau County Office regularly receives Institute literature, and we have furnished photos for its publication as well as handout items for its Turf Field Day.

AMERICAN HORTICULTURAL SOCIETY, INC. REQUEST

The following request was received from Herbert G. Meyer, chairman of the AHS Education Committee: "Dear Dr. Schery: One of the important programs of the American Horticultural Society, Inc. is encouraging and promoting Horticulture (Garden) Education. To make this program as effective as possible, the Society should have a Horticulture Education Committee of outstanding members who can be effective in establishing policy and getting results. You are considered such an individual. Will you serve?"

TURFGRASS EXHIBIT

Dr. Burger, a Curator at the Field Museum of Natural History, Chicago, requested aid in the preparation of a lawngrass exhibit in the museum's "Hall of Useful Plants". This is an exciting innovation, since museums have long devoted themselves more to the past than the present. We feel that a good exhibit emphasizing the major turfgrass species and their development into the lawn beauties of today, will have great and lasting influence when on exhibit in a world-renowned museum such as the Field Museum of Natural History. Dr. Burger has been encouraged to develop this idea, and we have offered photographs and information to help with the exhibit. Dr. Burger writes, "Lawn-grasses are an important group of plants that help make our communities more pleasant, and I would like to devote part of the exhibit to this subject -- could you suggest information and visual materials on the subject of lawns and turf that might be utilized in making museum exhibit? Any help you could give us would be greatly appreciated."

REPRINTS FOR ROADSIDE SHORT COURSE

We are pleased that Mr. Garmhausen, Ohio Department of Highways, has requested of the Institute for the annual short course tour, again this year such reprints as we care to offer. These are given out to the landscape architects attending the short course, the leading highway landscape men from usually 35 or more states and foreign countries. Speakers for the week-long informational sessions and tour include outstanding experts from all over the country. We are flattered to have Institute material again be a major hand-out item.

IN SYNDICATED COLUMN

George Abraham, in his widely syndicated Green Thumb Column, appearing in newspapers throughout the country, during September cited the Institute as his authority for advising about lawn mowing. The statement is made "low mowing sets back the good grasses, such as Kentucky bluegrasses and fine fescues ---" Even though exaggerated a bit, it's pleasant to be recognized, vis. "Dr. Robert W. Schery, Director of the Lawn Institute, and the country's leading lawn authority, has made many carefully run tests ---".

GOOD FESCUE ADVICE

This advice appeared in the "What To Do In September" column in Horticulture magazine: "Where lawns overplanted with ryegrass are too coarse switch to the fescues for winter green."

THE VALUE OF INSTITUTIONAL FILMS

Information received from the Broadcast Information Bureau of New York, supports our belief in the usefulness of a sponsored film such as was the former Bluegrass Beauty: "A few years ago your public relations film showings were restricted to some 500 stations. Today the market has grown, so that 200 non-commercial, 650 commercial, and over 2,000 cable systems show what we choose to call 'free' films."

BLUEGRASS HEREDITY

Berry, Glover and Daniel, Indiana, review linkage of turf characteristics in Kentucky bluegrass, in an article in the July-August Crop Science. They conclude "That simultaneous selection may be possible for important characters in the development of superior turf types."

GRASS SOUND-PROOFS

An article in Western Landscaping News reports that studies at Riverbanks Acoustical Laboratories in Geneva, Illinois, revealed grass to be a very efficient absorbent of sound. Along highways, in parks and courtyards, grass should be very useful for its acoustical properties, found to be superior to carpeting and even trees.

NEW DIRECTORY PUBLISHED

The National Recreation and Park Association, of Washington, D.C. is up-dating its SOURCES OF ASSISTANCE: A DIRECTORY OF NATIONAL ORGANIZATIONS WITH PARK AND RECREATION INTERESTS. The Lawn Institute is listed and reviewed at length. The opening gambit reads, "The Lawn Institute, a non-profit organization, is an educational and investigational arm of the quality lawn seed industry --".

INSTITUTE PUBLICIZED

The September 12 issue of the Seed World carried the item, "Better Lawn and Turf Institute holds Annual Meeting", including photograph of the new officers and complete listing of trustees and elected officials.

POST CARD RESPONSE FROM PRESS KIT (AUTUMN PRESS RELEASE)

Within 10 days after mailing the press kit, 127 return post cards were received by the Marysville office. The card accompanied the kit mailing, to verify continued interest and correctness of address. A few of the comments offered: "They are excellent and I do appreciate getting them." "Very informative, and fruitful!" "Thanks for interesting and useful material!" "Your up-to-date information is very helpful." "Many fine ideas and information. I use both in my lawn and in my column for my readers." "Very informative copy -- good complement to our abundant flower and vegetable garden features." "Glad you include several short items as we are always looking for good informative 'fillers'." "Invaluable for spring and fall garden sections--" "Very helpful and authoritative." "Very well done -- most useful!"

HEADLINE NETTED

Being useful to national columnists pays off. The Institute regularly helps George Abraham with his lawn inquiries, and we recently pointed out in response to an inquiry that no ground cover equals grass for economy, general usefulness, and ease of maintenance. A late September "The Green Thumb" column, widely placed, announces "Grass Gets Nod Over Vine Covers", with the reasons why given in the text.

BLUEGRASS PUBLICITY

The August issue of Grounds Maintenance carried the item "Renovating Bluegrass Lawns". It is good to have a bluegrass title, but the ten-step program advocated for renovation seems cumbersome and containing several unnecessary procedures. Step number 6 reads, "Immediately sow heavy grade bluegrass at the rate of 1½ lbs per 1,000 sq ft." This follows several separate mowing and manuring operations, and is followed by additional ones.

DEPARTMENT OF INTERIOR MENTION

A letter from California asking about Harvests mentions hearing of the Institute through a publication of the Department of the Interior. We didn't realize the Institute was so well known in the government!

PHOTOS FURNISHED

Requests have been received from the Cleveland and Cincinnati newspapers, for photos that might be used with lawn features in the gardening section. Candidate photos have been supplied in both cases, which we hope will result in good publicity for quality turfs and for the Institute.

STORIES PREPARED FOR NEWSPAPER SUPPLEMENT

Several national organizations are cooperating this year in issuance of a newspaper "Beautification Supplement" on the order of that sponsored last year through the American Seed Trade Association. The Lawn Seed Division of ASTA is bearing the share cost for production and mailing, and the Institute is contributing only the "talent" for preparation of the stories. It is planned that the supplement will be 12 pages in 1970, in three colors, with a much larger circulation than in the past. Mailing to newspapers will be made in February for spring usage.

Five main titles have been readied by Dr. Schery: Lawn Seed Facts, Ready-ing the Lawn, End Winter Lawn Drabness, Seeding Lawns, and New Lawn Varieties Highly Rated. In addition there are several shorter items, and appropriately captioned photographs naming quality grasses. Sample excerpts from the stories sent to the ASTA:

"Lawn seed' is not just any seed sowed for lawns. It is an expert blend of those grasses which grow well together --- some are appropriate for shade, persist well in spite of tree roots and low fertility (fine fescues). Others are luxuriant in the sun and where the soil is good (bluegrasses). Still others like humid climates (bentgrasses), -- "Which varieties? Today there are scores of exquisite new Kentucky bluegrasses, fine fescues from Oregon, Colonial bentgrasses and special perennial ryegrasses. It takes a real pro, -- a seedsman dealing constantly in select lawn varieties -- to know which are best ---"

"First order of business is to reseed bare spots and bolster thin turf. -- The American Seed Trade Association recommends seed of high quality rich in 'fine-textured' components." "While the weather is still cold --- mow the grass very close ---. This is the only time of year you will want to cut Kentucky bluegrasses and fine fescues that low, although you may mow lawn bentgrasses (the Colonial sorts such as Highland, Astoria and Exeter) this low regularly."

"A grass seed is one of nature's most successful inventions, -- seed is easy to handle; --- can lie dormant until weather is just right." "Exciting experiences are in store for people seeding new lawns. Years of turfgrass breeding and testing are now bearing fruit in elite new Kentucky bluegrasses, fine fescues, bentgrasses and perennial ryegrasses. --- strange new names identify the varieties. /Most commercial varieties are named according to species/ --- fortunately, seed houses with knowledgeable personnel are equal to the task of compounding good lawn seed blends."

STORY IN EDISON GARDEN NEWS

We are pleased that Editor Jecmen included in the July-August issue of the Edison Garden News (going to Edison employees in northern Illinois and Wisconsin), the Institute story Bluegrass Stands Guard. This item begins, "You'll get little argument that there is any carpeting so attractive as Kentucky bluegrass, or bentgrass around the home. But did you ever stop to consider all the other services fine lawngrasses render, -----".

STORY IN WEEDS, TREES AND TURF

Winning Turf Combination: Good Seed, Good Fertilizer -- was the title of a story done for the September issue of Weeds, Trees and Turf. Mention was made of several grasses, viz. " -- cultivars such as Fylking, Merion and Pennstar among the Kentucky bluegrasses, all bentgrasses, and even the newer fine-leaf perennial ryegrasses such as Manhattan, Pelo and NK-100. -- True, those attractive fine fescues such as Cascade, Chewings, Highlight, Illahee and Pennlawn do well with only moderate fertilization, -- -- maintained in exactly the same way except that the excellent Highland bentgrass there is fertilized monthly."

Unfortunately, the editors of the magazine included a story done for the Borden Chemical Company and submitted by that company to the magazine as a follow-up to the Institute story, without clear distinction that these were two separate items. We are delighted to have Borden's support, and publicity given the Institute in Borden releases, but feel it inappropriate for the editors to include an item such as this (which refers from time to time to a branded product) as though it were part of the by-line story. There also seems to be some confusion on the part of the editor with reference to the photographs, since these are not identified by the code letters in the printing. Other than this we are pleased to have a story emphasizing the need for autumn seeding, appearing in the trade publication of this sort at an appropriate time of year.

INSTITUTE PHOTOS MAKE STORY

A series of photographs and suggested text, sent to Morton Waters, editorial director for Universal Publishing and Distributing Company, New York, has resulted in a 2 page picture sequence in the September Home Garden Magazine. The story is entitled Your "Old" Lawn Can Be Made "New" Again -- a Few Hours of Time Now Will Do the Trick. Six different photographs were utilized, credited to the Better Lawn and Turf Institute. A caption states, "Use a good mixture of seed when reseeding -- be just as critical as if it were a new lawn --" Another caption advises, "The plant food gives the old plants a needed boost and helps new seedlings get established."

Since this particular story, although most attractively illustrated, was not under strict editorial control by the Institute, it has not been reprinted for distribution to members; we feel that there are already available reprints better explaining the need for autumn seeding, which have and can be reprinted at lesser cost. But if any members are especially interested in the Home Garden story, it appears on pages 58-59, of Volume 56, number 9, September, 1969 Home Garden.

SEED WORLD STORY

The August 8 issue of Seed World carried, as its Bulletin Board Suggestions, the Institute item Lawn Seedbed Importance. As is customary, byline credit is given the Institute. The story promotes the autumn seeding season, opening -- "Autumn is the best time of year for starting those new bluegrass, fine fescue and bentgrass lawns". Further along in the story, "The Kentucky bluegrass, Oregon fine fescues, and lawn bentgrass such as Highland, are none of them in need of cold weather coddling. --- Autumn planting best for these northern lawn beauties".

STORY IN HANDYMAN

A well-illustrated Institute story appeared in the Family Handyman, October. The editors included an offer of Institute literature for anyone sending a self-addressed stamped envelope to the Marysville address. This has resulted in many inquiries and further chance to stimulate autumn seeding. The story was titled "Autumn is For Lawn Care", with both author and Institute byline. Sub-title was "If your lawn needs attention, now is the time for action". Eleven photos accompanied the story, including picture of a sack of Kentucky bluegrass.

The text opens, "Except in the far South the most cherished lawngrasses -- Kentucky bluegrasses, fine fescues and bentgrasses, principally -- start best and grow best in autumn". Instructions are then given for seedbed preparation, fertilization and seeding. As to mowing, "Since bluegrasses and fine fescues don't grow very tall as the days grow shorter in autumn, you may not have to mow your new grass at all." The story finishes with suggestions for weed control.

IN FLORAL MAGAZINE

The Institute was pleased to have its story, "Season to Seed, Feed and Weed", featured in the September Floral magazine. In addition to the illustrated story itself, an Institute color photo graced the back cover of the issue. The Institute was given credit throughout, as well as authorship byline for Dr. Schery.

The story opens with a map, indicating the cool-season lawngrass zone: "Bluegrass, fine fescue and bentgrass lawns are at their best not in summer, but in the cooler seasons -- these grasses can stand a lot of daytime heat if the nights are cool; --".

Instructions are given for preparing the seedbed, fertilizing the soil and weeding. A summarizing box insert lists varieties of Kentucky bluegrasses, fine fescues, bentgrasses and fine-leaf perennial ryegrasses by name, indicating which among the bluegrass varieties are low-maintenance cultivars.

SLIDES FROM OREGON

The Institute is much indebted to Jesse Harmond, Oregon State University, for a loan of slides which proved to be of considerable interest at the First International Turfgrass Conference in England. Upon returning the borrowed slides, Jesse kindly selected several which were duplicated in his collection, and presented them to the Institute. It is nice to have these on hand for future presentations relating to seed production.

STORY IN TURF BULLETIN

We were pleased that the summer, 1969 issue of the Massachusetts Turf and Lawngrass Council "Turf Bulletin" carried the Institute story New Lawn Seeds Ready to Sprout Profits. This was a reprinting of a story originally done for the Home and Garden Supply Merchandiser, and gives us a lot of extra mileage in technical circles from this item. You may recall the story begins, "These are exciting times in the lawnseed industry. A torrent of new varieties, especially in Kentucky bluegrass and fine fescues, is streaming through the testing phases, ---".

STORY IN HORTICULTURE

The Institute story, "Lawn Thatch -- What It's All About", appeared in the September issue of Horticulture. The reasons for thatch accumulation are discussed, and the degree related to species and varieties: " -- almost all of the southern lawngrasses tend to build thatch more readily than those which spread underground by rhizomes, such as the bluegrasses and fescues -- Tifgreen bermuda thatches more than common bermuda from seed, and Fyking, Merion and Pennstar bluegrasses more than the natural type represented by varieties such as Arboretum, Kenblue and Park." Means of prevention and correction are then reviewed.

PURDUE SURVEY

The Institute received an elaborate questionnaire from Purdue University, part of a federally sponsored consumer education study. A national inventory of consumer education programs is being attempted, and a Source Book of Education Programs in the US is expected to be issued. The Marysville office has supplied the necessary information to Purdue, for inclusion in the survey and listing in its publication.

IN TURF AND GARDEN GUIDE

An Institute story appeared in the Autumn, 1969 issue of the Borden Turf and Garden Guide, accompanied by colored pictures taken on Institute grounds. The story dealt with weeding and bolster seeding, and recommended "Precede the October weed killing with a -- seeding -- in August or September." An accompanying resumé by Lloyd Zeman advised, "Be cautious of low-priced lawn seed. Unscrupulous promoters are anxious to sell low-quality, inferior seed. 'Bargain' blends are often more expensive than those of good quality --."

PRESS KIT IN USE

In the June 11 issue of Seed Trade News, the editor utilized one of the spring, 1969 press kit releases, entitled "Bluegrass Blue?" It read in part --- "Hardy lawn species such as Kentucky bluegrass and fine fescue can endure drought, --- --- they snap back when rains and cool weather again come."

UNIVERSITY REQUEST

Alvis E. Jones, newly appointed Grounds Superintendent for Murray State University (Kentucky), requested by name 36 Institute reprints to help him in his activities. Of course these were immediately furnished without charge.

IOWA GOLF COURSE SUPERINTENDENTS REPORTER

The August issue of the Iowa Golf Course Superintendents Reporter devoted the top half of its back cover ("The 19th Hole") to the Institute story entitled Kentucky Bluegrass. The Lawn Institute's seal, with author credit and photo, were included. The story opens, "--- all the excellent Kentucky bluegrass varieties, fine fescues and the bentgrasses that are available today from seed."

TECHNICALTURF ANNUAL APPEARS

The 1969 Turf Research and Irrigation Annual put out by Park Maintenance magazine each July, appeared on schedule. Guest editor this year was Elwyn Deal, of Maryland. As in the previous 12 Turf Annuals attempt is made to cover all research in all parts of the country, obviously an impossible task even were each research institute fully responsive when asked to send in published reports for the year. It would seem that perhaps Dr. Deal was unsuccessful in gathering much information, or that turfgrass research has become so diversified that this type of annual review is not so meaningful as it was some years ago. In any event this year's presentation appears somewhat erratic, even to the extent of reporting Maryland research in several categories while ignoring other parts of the country entirely. Dr. Deal emphasizes that information currently at hand is not being fully utilized, that more people could be better informed with the knowledge currently on hand. But he sees unlimited opportunities for further research at the same time.

First topic for discussion is Disease. Pythium is cited as of increasing concern, with the pythium-specific, dexton, giving disappointing control in certain tests. Mallinckrodt's new Koban was reported preferable in Oklahoma tests. Demosan was the most effective control for snowmold in tests by Toro, Minneapolis.

Very little information was offered on Fertilization, although Deal reported at some length about his own misgivings about fertilizer-pesticide combinations, viz. "We are not at all sold on the merits of combination materials ---". The review of Grasses reported a few comparisons without offering any special conclusions. Fyking was mentioned as an outstanding new possibility, and "seems to get along well with fine fescues, even Colonial bentgrasses such as Highland."

Insects and Pests received very short coverage, consisting of an Arizona report on ground pearl, and a more broadly useful chart for turfgrass insect control by a Michigan State extension specialist. Irrigation was treated more "in depth", although citing California research entirely. The section on Management dealt with such diverse topics as salt damage to turf from its use for melting snow, flood damage to sod, cable heating of soil in athletic fields, protective covers for turf in winter, and timing of thatch removal for maximum greenness (first week of March was best for bermudagrass in Oklahoma). A new herbicide just cleared by the USDA, Tandex, is mentioned, to be used either as a pre-emergence or post-emergence treatment, apparently for all types of vegetation (promising for highway shoulders, parking lots and other non-crop areas). Soil modification is discussed as investigated in West Virginia and Indiana (Purdue), with what would seem few practical conclusions for general turf work.

Maryland work by Deal is first item of coverage under Weed Control, with the observation that much grass (especially annual bluegrass) loss may be due to air pollution. Maryland research also indicated that the use of arsenicals for weed control was "touchy". There was relatively little new to report on pre-emergence control of crabgrass, although Dacthal did not perform as well as Betasan and Balan in Los Angeles tests for control of annual grasses such as Poa annua. Deal concluded with another Maryland report of his own cautioning about the dangers from use of phenoxy and dicamba herbicides.

SEED RESEARCH FOUNDATION REPORT

The summer issue of Search, sponsored by the American Seed Research Foundation, appeared in late September. This was primarily involved with brief reports from the Seed Quality Investigations staff of the ARS, Beltsville, Maryland. The elaborate series of projects underway is outlined in the report. A few trends shaping up may be of interest at this time.

The detection of seed-born pathogenic fungi still appears technically unfeasible. Studies involving fungus growth on a variety of media showed little significance, and suspected fungus groups were not always associated with low germination.

Toole's discussion of "Control of Seed Germination" makes one wonder about the value of the typical germination tests. In Kentucky bluegrass (Newport), for example, darkness or prolonged light gave weak germination, about 5-10 minute exposures stimulated germination remarkably. The promotive-inhibitive effect of light seemed to vary greatly with species, and it almost looks as though each kind of seed must be investigated individually?

Identification of seed (varietal identification) by its protein composition is approaching feasibility. Ground seeds can have the proteins separated electrophoretically, and be compared to known stratifications. One might ask, however, whether protein identification is any more reliable than morphologic identification, although it would certainly be quicker for identification at the seed level. An interesting side development here is the possible identification of a protein associated with perenniality.

Respiration, measured easily either by oxygen consumption or carbon dioxide emission, still seems the best indicator of seed metabolic activity at the start of germination. An indication of vigor can be had within a few hours of wetting seeds. It appears that initial differences are maintained throughout the life of the plant, and affect maturation date. Researcher Woodstock states, "Plant material which is under-or-over ripe at the time of a single destructive harvest must frequently be written off as lost, even though it is of high quality in other respects." This approach may lead to detection of the uniformity of growth potential of seeds within a lot, -- although it could be questioned whether this is of any great importance with turf seeds. Biosynthetic capacity of germinating seeds can also be indicated by measuring the incorporation of radioactively marked amino acids, which seem to show up strongly within the first two hours after seed wetting. High vigor indications in this early stage match field emergence well, especially under poor growing conditions.

Seed deterioration seems measurable by loss of simple carbohydrate within the first day of initiating germination. Older seeds exhibited great reduction in rate of glucose utilization, which to a lesser degree corresponded with germination. Researchers Abdul-Baki and Anderson state, "If the biochemical processes on which growth depends, can be measured directly on the molecular level, the days or weeks required (for conventional seed testing) can be reduced to hours."

LIBRARY REQUEST

The Institute was pleased to honor a request from the Malta Township High School Library, Illinois, for literature to be filed there on "Information on lawn care and lawn products". The request comes from Lorna Vogt, Librarian.

MORE ON WINTERSEEDING

Meyers and Horn, Florida, issued a six-page handout at the First International Turfgrass Conference in England, on The Two Grass System in Florida (Overseeding). Portions of this summary have appeared elsewhere in the United States, some of them reported from time to time in Harvests. Because of the increasing importance of winterseeding to the quality lawnseed trade, members may be interested in a few of the highlights from this presentation.

With nearly 20 million tourists visiting Florida, the appearance of winter turf is important. *Poa annua* is an ubiquitous weed in Florida golf courses, and lighter color species (such as *Poa trivialis*) tend to mask it better than some of the darker green grasses preferred for permanent lawns in the north. The latter, however, are excellent on naturally dark color turfs such as bermuda. Bent, fine fescue and bluegrass are generally considered to give a superior putting surface on golf greens compared to annual rye. The advantages of ryegrass are inexpensiveness and quick establishment. The preliminaries for good establishment both on general turf and specialized turf (golf greens) is discussed. Spring transition back to the permanent grass shows annual ryegrass dying first, followed by fine fescue, bentgrass and bluegrass; rapid dying out is not wanted, so that ryegrass rates poorly in this respect.

The test results at various points in Florida are outlined and discussed. In general the best component of a seeding mixture when planted alone rated just as good as the mixture, but of course the mixture broadened the adaptability. The authors state, " -- best overall performance on a year-to-year basis can be expected from 3-grass mixtures --" Rating charts are then given for Gainesville, Orlando and Ft. Lauderdale. In the Gainesville list a combination of Pennlawn fescue and Kentucky bluegrass rated first, followed by bluegrass alone second, and Penncross bentgrass alone third; in Orlando Penncross bentgrass alone was first, followed by a mixture that included bent, fine fescue, bluegrass, ryegrass and *Poa trivialis* in second place, and tied for third mixtures that included bent, fine fescue, ryegrass and *Poa trivialis*; in Ft. Lauderdale Penncross bent alone rated first, with a 3-way tie for second of blends that included Penncross bent with Kentucky bluegrass, Kentucky bluegrass with *Poa trivialis*, and Penncross bentgrass with *Poa trivialis*. It should be noted that many of the other 31 grasses or combinations in these trials were not far behind the first three, and would have made acceptable cover.

At Gainesville the improved perennial ryegrasses (NK-100 and Pelo) gave markedly better ratings than other ryegrass in certain "modified" treatments, while at Orlando and Ft. Lauderdale Park bluegrass was markedly ahead. The university offers several alternative recommendations for overseeding golf greens, that include Penncross bent plus Kentucky bluegrass, Pennlawn fine fescue plus Kentucky bluegrass, Penncross bent plus Kentucky bluegrass plus Pennlawn fescue, and Penncross bent plus Kentucky bluegrass plus *Poa trivialis*. It is suggested that when price is a critical factor that Seaside or Highland bent can be substituted for Penncross, that Illahee or Chewings for Pennlawn fine fescue, and Newport, Delta or Park for Common Kentucky bluegrass.

MORE AIRPORT MOVIES

Modern informs us that their new Skyport Cinema has been opened at the International Arrival Building at Kennedy Airport in New York. With the recent congestion and crowds at airports there has been standing room only for sponsored movies at this free movie lounge. It would be nice to have a lawn movie showing.

SUMMER TURF BULLETIN

The Massachusetts Turf and Lawngrass Council, in its Summer, 1969 Bulletin, carried several reprinted stories from other publications and a few original presentations. Lead story was that of the Lawn Institute, New Lawn Seeds Ready to Sprout Profits, which described the present trend towards polarization of blue-grasses into self-reliant and elite camps.

Second article was review of potassium effect on turf, by E. G. Konieczny. The ways in which potassium occurs in the soil is discussed, followed by a lengthy discussion of variability in plants as to K^{+} ion exchange capacity. Generally clover and other Dicots have a high cation exchange capacity, "pulling" divalent cations such as calcium and magnesium from the soil preferentially over monovalent potassium. Just the reverse is true for most grasses, including bent-grasses which were the object of the tests cited. Finally research in various parts of the country is reviewed, indicating how frequently potassium is deficient, and the influence of potassium on hardiness and disease prevention.

A review of fertilizer spreaders reprinted from Grounds Maintenance follows, and a discussion of sulphur coated urea reprinted from the Sulphur Institute Journal. Incidentally, sulphur-coated urea used on the Institute grounds this year has exhibited retarded influence of nitrogen, and seemingly reduced total incidence as well.

The effect of salinity on turfgrass is reviewed by Wheeler quoting various research reports, especially from California. As we have noted previously the extensive tests there have found Seaside bentgrass especially tolerant of salinity. Proper methods of irrigation to avoid excessive salinity are reviewed.

Final items in this issue include a review of *Poa annua* by W. H. Daniels, reprinted from Weeds, Trees and Turf, advocating build up of arsenic in the soil to levels toxic for *Poa annua* but not the better grasses; and a review of pre-emergence herbicides by E. E. Deal, citing the probable dates of crabgrass germination in the Washington, D. C. area. Nothing new in these two items.

ANNUAL USDA FIELD DAY

The International Turfgrass Conference tour made it impossible for Dr. Schery to attend the USDA Turfgrass Field Day on August 6, this year. The annual exhibition was held at the Plant Industry Station, Beltsville, Maryland. An interesting series of exhibits was on the agenda, viz.:

1. Bermudagrass wear study
2. Studies of stripe smut control on Merion Kentucky bluegrass.
3. Bermudagrass overseeding study
4. Performance of several bentgrass selections to pre-emergence crabgrass herbicides.
5. Exhibit of zoysia strains selected for fall cold-tolerance and early spring green-up.
6. Use of calcined clay in soil modification planted to several species of turfgrasses.
7. Control of thatch in Kentucky bluegrass turf.
8. Kentucky bluegrass variety and mixture trials.
9. Evaluation of Kentucky bluegrass selections.
10. Tall fescue study - treatments include 3 mowing heights, 2 mixtures, and 9 rates of nitrogen and time of application.

Continued on next page.

ANNUAL USDA FIELD DAY - Continued

11. Phosphorus study on bluegrass turf. Rates include 0 to 4,000 pounds of actual P₂O₅ per acre at 500-pound increments.
12. Billbug and nematode control in zoysia turf.

BACK TO BLUEGRASS

The July issue of Weeds, Trees and Turf carries a report on the Central Plains Turf Field Day, near Manhattan, Kansas. Discussed are such matters as growing bentgrass (for greens) on straight sand, and an excellent screening for hardiness of bermudagrass varieties by the very severe winter (270 candidate grasses reduced to 24). But of special interest to members may be the athletic field program, in which an initial bermudagrass planting is now superseded by a bluegrass planting of Fylking and Windsor bluegrasses started this spring. Even the high school football fields, heavily used, seem to depend on bluegrass in this marginal climate, although often blended with tall fescue where care must be less than ideal. The Blueville Nursery in Manhattan, in charge of the Bishop football stadium there, bolster seeds each autumn at full rate where the turf has been pretty well dug up by play, and at half rate where there has been less turf injury. If bluegrass is performing this well in Kansas, good turf should be child's play farther north!

NATURAL WEED KILLER

In recent years interest has centered upon biological antagonisms, in which one plant inhibits the growth of another. Ryegrass, for example, has at times restricted germination or growth of grasses that follow it, and quackgrass inhibits legumes. Akin to this is the discovery of a substance secreted by certain nitrogen-fixing soil bacteria, as reported in the July Scientific American. The substance is a powerful plant inhibitor, especially interesting in that it is not harmful to animal life and because it breaks down in the soil within 3 days. The ARS of the USDA has named the substance rhizobitoxine, because it was first detected in Rhizobium root nodules on soybeans. Rhizobitoxin inactivates an enzyme essential for protein synthesis. It is said to be effective as little as 3 oz per acre, used against seedling weeds (after crop seeding, but before emergence). Rhizobitoxine has very little effect on mature plants.

ROOT COMPETITIONS STUDIED

Whitcomb, Roberts and Landers report upon an experimental arrangement in Vol. 50, No. 2, Ecology, whereby root competition between turfgrass and tree could be studied. Young trees were planted in larger pots, and roots extended from holes in these pots into smaller pots where grass was planted. Various combinations were possible, with the roots of 3 or more trees made to grow into a single grass pot. The article is concerned more with the technique than with end results. However, preliminary indications are that tree roots interfere little with grass growth if growing conditions are kept good; occasionally Kentucky bluegrass restricted quantity of tree root growth, however.

INSTITUTE PHOTO

Page 16 of the August issue of Floral Magazine, carried an Institute photo in conjunction with a discussion about landscaping.

LEAF STOMATA AND DROUGHT RESISTANCE

A study conducted in Israel, reported in Vol. 50, No. 2., Ecology, indicates that the greatest xerophytic tendency in trees is related to abundance of stomatal openings in the leaf (upper surface as well as below). One might suppose differently, for stomata permit some escape of moisture. On the other hand transpiration from leaves, that presumably draws moisture up the stem, is dependent upon stomata. It would be interesting to learn if a higher incidence of stomata, on both surfaces of the leaf, might result in greater drought resistance with lawngrasses?

FOODS RICH IN PROTEIN PROVIDES BETTER GROWTH AND YIELD

Studies done at Michigan State University, reported in the July 4 issue of Science, indicate that seeds (wheat and oats were the test organisms) that contain a higher protein content produce plants that grow faster and yield more than similar seed with a lesser protein content. Interestingly, the high protein content need not be inherited; the effects were noted when seed protein content was raised by treatments with herbicides such as simazine and atrazine. This is the next thing to the long-discounted "inheritance of acquired characters"!

INSECTICIDE INFLUENCE

In a paper presented at the AIBS meetings, Donald Shure, Rutgers University, reported upon after-effects of field spraying of the insecticide diazinon. Shure reported that the first year after application, "a significantly greater density and diversity of vegetation resulted on treated vs. untreated areas." There seemed to be no significant change in relative importance of plant species, but greater total biomass of vegetation on the sprayed areas. Such results suggest the lack of harmful side effects when treating swards such as lawns with insecticides.

TALL FESCUE FOR TURF

Juska, Hanson and Hovin report in the July-August, 1969 Agronomy Journal upon Evaluation of Tall Fescue -- For Turf in the Transition Zone --. Adequately fertilized tall fescue rated better than that less well fertilized. In general, tall fescue planted alone gave superior average ratings to tall fescue planted in mixture with Kentucky bluegrass. Where tall fescue was mixed with Kentucky bluegrass, bluegrass gradually gained at the expense of the tall fescue, and the tall fescue plants frequently clumped. The authors conclude that "tall fescue is adapted to the transition zone and appears suitable for expansive turf areas where its coarse texture is not objectionable".

ABOUT HELMINTHOSPORIUM

Noted in the tall fescue discussions by Juska et al in the July-August Agronomy Journal, was this statement: "In general, leaf spot damage on Kentucky bluegrass was not as severe in mixture with tall fescue as when common Kentucky bluegrass was seeded alone --" One wonders if other such instances have been reported? Since Kentucky bluegrass is offered in combination with fine fescue in most lawnseed mixtures for much of the United States, this would afford a good sales point. Certainly it would be another argument favoring seed blends.

STRENGTH OF SOD ROOTING

A report by King and Beard in the July-August Agronomy Journal dealt with the rooting strength of Merion sod. Sod was placed on a screen-like framework and let root into prepared soil below. The force necessary to lift the frame later (after a given interval) indicated the strength of rooting as distinct from force required to slide the sod sideways. The report indicates that sod grown on organic soil rooted into the underlying soil better than did that grown on mineral soil. It is not clear what the case would be were the sod rooted into something other than a sandy loam (there are reports of mineral sod rooting better on athletic fields). Most Michigan sod is grown on organic soil.

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