

BETTER LAWN - - HARVESTS

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THIRD INTERNATIONAL TURFGRASS CONFERENCE AND TOUR

The Third International Turfgrass Conference, papers for which are reviewed elsewhere in this Harvests, was most ably guided by President Boeker, with a pre-conference visit to research grounds and turf installations from Cologne to Munich in Germany; five days of formal presentations in Munich, with simultaneous translation of papers into five languages; and a post-conference tour from Munich through selected research and demonstration areas in Switzerland and France. If you wish details on any particular part of the conference, please write. Hosts in Europe could not have been more hospitable, and provided participants with a wealth of explanatory literature, much of it translated into English.

One of the participants, Dr. Taylor of VPI (Virginia), has already summarized the "experience" in the VPI Tech Turf Topics. An abridgment of his summarization will acquaint members with the way a professional turfgrass breeder views the European situation. Taylor notes that most European countries maintain national registration lists of varieties which can be legally sold within the country. Each country conducts trials, mainly relating to distinctiveness, uniformity, and stability. Other trials compare new varieties with old ones, and help determine what will be allowed on the recommended lists.

As a rule breeding is done by private firms, with public agencies (including universities) keeping "hands off" other than for basic research and testing of the cultivars. It is rather expensive to work a new variety through to the recommended listing, and rather few attempts are made (restricted to varieties with good potential). Since the primary use of cultivars is for sportsfields rather than home lawns, more evidence is put upon wearability than we are accustomed to seeing in the United States.

Particularly attractive at time of the tour was the Mommersteeg bluegrass, 'Kimona'. Much emphasis was given in Germany to the perennial ryegrass 'Loretta', for which it is said Scotts has obtained United States distribution rights. However, in the tests inspected, a number of perennial ryegrasses look very much alike, and the question may be one of adaptability to the United States conditions so far as American use is concerned. Perhaps even more so than in the United States, numerous new cultivars are under inspection at the present time. It is reasonable to suppose that a number of them will eventually be offered for sale in America.

PRESIDENT CALLS MEETING OF EXECUTIVE COMMITTEE

President Jacklin has scheduled a meeting of the executive committee for Monday afternoon November 7, in Kansas City, during the Western Seedsmen's Association meetings.

LAWN AND GARDEN PROMOTION IN EUROPE

President Jacklin asked Dr. Schery to check turfgrass promotional efforts in Europe, while attending the Third International Turfgrass Conference this summer. Almost nothing of extension-type activities such as are commonplace in the United States are carried out in Europe, and (aside from a few major firms) rather little attention is given turfgrass. There seems to be very little in the way of "garden page" information printed, and most of the promotional efforts are confined to well-done (and costly) leaflets and other promotional materials privately sponsored by a rather limited number of firms engaged in turfgrass sales on the continent.

In the affluent countries, interest is beginning to be aroused for home grounds care, - a bit like the situation was in the United States when the "move to the suburbs" first began. However, there is very little home lawn space; buildings are often flush with the street, or with a very narrow intervening sward, and the backyards are given over mostly to ornamental plantings and vegetable gardens. Where there is grass, this seems generally "taken for granted", with the public at large little acquainted with improved cultivars or lawn care products. Likelihood for change is limited, since population pressures are great, and land costs high (a small lot in Stuttgart, Germany, for example, cost about \$60,000 for the land alone).

A tradition of gardening literature exists in England, although again turf is of secondary importance compared to ornamental plantings. The maritime climate of England is quite unlike the continental climate of the United States, and interior Europe, so that questionable practices there (which would be devastating in much of the United States) can be tolerated. In spite of the common language, we therefore have little to communicate to England (and vice versa) concerning performance of lawn cultivars.

Commercial firms dominate the situation throughout Europe much more so than in the United States, and business interests take precedence over "public service" (such as independent university research). Of tremendous commercial importance are the public sportsfields, for which comparatively abundant funding is available. It appears that in most cases public administrators hire private firms to design installations, and even manage them thereafter. A good bit of attention that private firms (and their breeders) lavish on turfgrass, aims for cultivars well suited for a sportsfield rather than for a home lawn (although, obviously there is much overlap).

Because of language, commercial, and climatic differences, it appears that rather little of what the Institute prepares for the American gardening press would also be applicable to Europe. European firms and authorities likely would be more interested in technical information (details about performance or management), than in popular exposition for homeowner consumption.

REMARKABLE TENACITY OF LAWNGRASSES

1977 was one of the driest-hottest years ever on the Institute grounds in Marysville. Two separate months had no measurable rainfall at all, and there was only one significant rain (about 2 inches) in early June until a 3 inch "gusher" October 1. Because the irrigation system was not functioning in early summer, many cultivars seemed lost; yet, almost miraculously, the plots have "healed" now (although some of the grass may be volunteer?). The unwatered test section showed great loss or thinning or bentgrasses and fine fescues; perennial ryegrasses were less damaged even than bluegrass! As the season progresses, we should have some interesting observations on what can come back.

A FEW NOTES FROM THE THIRD INTERNATIONAL TURFGRASS CONFERENCE TOUR

Members may be interested in a few of Dr. Schery's impressions gained while inspecting turfgrass plantings and the general environs of central Europe during the Third International Turfgrass Conference Tour.

Near Cologne, the vegetation is very reminiscent of the central United States, with many of the same trees, weeds and volunteer grasses. Poa annua tends to dominate all well kept turf in the low country from Cologne northward. Golf greens are generally overseeded with a mixture of bentgrasses, while little attention is paid fairways (which turn to a high percentage of Poa annua). On the whole golf courses are not of great interest, most attention focusing on soccer fields.

Weed control is mainly with 2,4-D, perhaps mixed with dicamba, the same as in the United States. The weeds are pan-boreal, and, indeed, may have been introduced to the United States from this part of Europe during colonization. Dandelion, clover, oxalis, chickweed, and many other familiar weeds are commonplace.

A great deal of emphasis is given soil composition, and no expense seems spared (public money) in preparing an all-weather soil medium. Running tracks surrounding the field are usually of a rubber-flaked composition, but nowhere was artificial grass seen for the sportsfield playing surface. In most cases the soil mix contains about 85% sand, the remaining 15% a variety of synthetic or natural organic substances. In most cases automatic Toro irrigation systems were established. Some of the fields are sodded to speed up bringing them into play. A few years ago the standard sod was basically Kentucky bluegrass, with admixture of timothy (Phleum nodosum or P. bertolonii) and crested dogstail (Cynosurus cristatus). Phleum and Cynosurus have come into disfavor, and are being substituted for primarily by perennial ryegrass ('Loretta' is a favorite for overseeding established fields). The stand at one field visited was estimated to be 60% 'Loretta' ryegrass, 40% Kentucky bluegrass at the time of visit. Both 'Enmundi' and 'Parade' bluegrasses are well liked for sportsfield seeding, and 'Prato' has been frequently utilized.

In the higher country away from the Rhine valley bluegrass-ryegrass seemed to dominate, and was not much invaded by Poa annua. At the Wolf-Gerate (alliance with Scotts) test grounds near Freudenberg, 'Yorktown II' ryegrass seemed especially effective. Wolf-Gerate seems to be adapting a Scott-type "program", and in the community has developed excellent renovation techniques.

Dr. Skirde's plots at Giessen are quite extensive, and here 'Kimona' bluegrass was outstanding, even under his practice of artificial wear (which involves rolling with a special cleated roller 8 passes weekly for 10 months of the year). In his tests there is more bluegrass (compared to Phleum and fescue) under a rolling regimen than when the planting is not rolled, indicating good wear with bluegrass. Most of the research is concerned with soil compoundings and behavior. Skirde recommends, for new seedings, about 30-35% of perennial ryegrass, the remaining 65-70% cultivars of Kentucky bluegrass.

At Regensburg golf course much Poa annua was again noted in the fairways, while the greens were seeded to 'Pennncross' and had become quite "puffy". At the Steinach properties (breeder of 'Loretta'), it was said that German law lets the proprietor determine that the variety be used in certain mixes only. It was also apparent (from examining small packages of seed) that label information is not required such as indicates quality of seed in the United States. The purchaser learns nothing about inert, weed or crop content, and only a little about germination.

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A FEW NOTES FROM THE THIRD INTERNATIONAL TURFGRASS CONFERENCE TOUR - Con't

An early stop on the post-conference tour was the Schweizer seed house, in Thun, Switzerland. Edgar Schweizer is doing a remarkable job of introducing complete "programs" throughout Europe, and has been the consultant for expensive installations even as far away as Paris. Much as Scotts have done in the United States, Schweizer has initiated simplified procedures with easily-used products and reliable equipment. His program should be even more effective than Scotts, since it admits of use of sprays as well as dry-applied materials. Schweizer likes 'Parade' bluegrass for its good autumn color, but finds it weak in spring. On the whole he finds 'Skofti' the best looking bluegrass, and favors a lawn fertilizer containing half each of UF and IBDU. With around 50 inches of rainfall in Switzerland, he sees little need for irrigation apparatus.

Turfgrass activities seem a little less advanced in France, than in Switzerland and Germany. Again the vegetation, Lake Geneva-Paris, is very similar to what might be found in the Ohio Valley, including clover, chicory, and the familiar lawn weeds; bluegrass seems to do especially well in the shade, while ryegrass and Poa annua are commonplace. In the south of France several of our southern species find some use, especially bermuda (also some prairie species for dry [sandy] habitat). The French experts tend to recommend more complex mixtures than is customary elsewhere in the U.S.

In recent years there has been heavy emphasis on public housing, including subsidized "cottages" as well as high-rise apartments. Almost all of these have designated play areas, and a considerable amount of landscaping. Their establishment and maintenance seems to be financially quite important to the turfgrass industry. Maintenance is the responsibility of the municipality, not of the occupants.

An example of the lavish expenditures for turf in France are the plantings (three stories up over concrete) at La Defense, where again costs are less important than providing a modicum of turf for personnel to lounge upon at this extensive center. There are many test plantings, and maintenance is almost on a hydroponics basis, trying out many of the Purdue University ideas (apparently with scant success, to judge by observation at time of visit). 'Highland' bentgrass plantings were poor, but 'Parade' bluegrass and 'Manhattan' ryegrass were fairly good. At the time of visit a fescue (Festuca rubra littoralis 'Menoir') was noted as the best turf. But with the abundant use of irrigation (plus ample natural rainfall) almost all plantings turn to Poa annua (and bentgrass) within a few years. It was noted that even some Dichondra was volunteering.

The Paris environs is great for dramatic "styling" of almost everything, - old castles, esplanades, parkways, etc. But a special interest is horse racing at Chantilly, where all racing is on turf (in contrasted to very limited turf racing in the United States). Here various combinations of cultivars are being tried, much in the fashion of sports-fields in Germany, with a lot of emphasis on resiliency as the best possible footing for the horses. The French experts lean a bit more to the "older" blends than do the Germans, and tend to include species of timothy, dogstail, tall fescue, etc. not much used elsewhere. In fact, in eastern France, perennial ryegrass is less utilized than in Germany (it is felt to be too aggressive), while fescues are much more favored. On some occasions pure bluegrass plantings are seen.

HORTICULTURE PLANS "SCIENCE" ISSUE

Editor Trachtman, Horticulture (Boston) has invited Dr. Schery to prepare coverage on "Science and the Lawn", in a special issue to be devoted to science in the garden, in celebration of the 75th anniversary of The American Society for Horticultural Science. It is anticipated that the July 1978 issue of the magazine will be devoted to this.

FOR PLANTS AND GARDENS

The story "The Alternative to Lawns" was prepared and sent to editor McGourty, Brooklyn Botanic Garden, for winter appearance in Plants and Gardens, in answer to the Arthur Ode article suggesting that lawns are ecologically unsound and well might be replaced by "meadow". The story cites Dr. Schery's personal experiences with land retired to unmowed vegetation, and the trials it brings (what with no evolved machinery and program to prevent objectionable trends).

ABRAHAM INQUIRES

George ('Doc') Abraham, syndicated columnist and TV personality, asked the Institute for some "myths" to air on his program. Among items suggested were:

Fertilizers, - not all the same (advantages of slow release)
Grasses, - not alike (disease and pest resistance by breeding)
Etc.

AMERICAN NURSERYMAN SERIES

The first article in a three-part series for the American Nurseryman magazine was prepared during August, under the general title "Guide For Lawns". This first segment provides generalities on the grasses used in various parts of the United States, and something about their individual habits and importance. To further emphasize the individual cultivars, Variety Review Board acceptances are listed (with brief description) according to species) and alphabetized within the species. The story is designed to give sales personnel (as at garden centers) a general overview, with specific information about modern cultivars and their maintenance. Later stories in the series will discuss establishing a new lawn, and maintaining an established one.

SEEDSMEN'S DIGEST STORY

A story entitled "The Value of a 'Variety Review Board'" was prepared for appearance in the Seedsmen's Digest in the near future. The article details what the Lawn Institute "Variety Review Board" is, its history, and how it operates. Included also is an updated listing of "Cultivar Acceptances" as a follow up on an earlier Seedsmen's Digest piece entitled "New Varieties For Fine Turf". This should make an excellent epitomized reprint for handout.

PARK MAINTENANCE TREATMENT

The story "The Search For Better Lawngrasses" was prepared for Park Maintenance magazine during the summer. It deals with the maturation of the turfgrass industry, the qualities being bred into the new turfgrasses. An "appendix" of "Modern Turfgrass Sampling" is included, which lists the Variety Review Board acceptances, and gives thumbnail sketches of the cultivars.

CALIFORNIA GOLF COURSE SUPERINTENDENT'S INSTITUTE

The fifth and final "Institute" Proceedings, organized for the California Golf Course Superintendent's, (Northern California Golf Association), by the University of California (Davis), was received in early August. This is another excellent publication of some 138 pages, dealing with "Course Design For Quality Maintenance". Guest speakers, including Geoffrey Cornish of Massachusetts, provide interesting and thoughtful discussions about the history of golf, the design of courses, and the practicalities of their management. Even though little discussion is given turfgrasses and their management, Institute members who number golf courses among their clientele may be interested in knowing about this publication as an elucidation of trends with the industry and the viewpoints of the golfer (rather than the turfgrass specialists).

'WOMAN'S DAY' SCHEDULES INSTITUTE

Dr. Schery has been asked to prepare a lawn story for use in Woman's Day magazine. Current varieties, and how to use them intelligently are to be featured. Very likely color illustrations will be used. Manuscript entitled "The Tidy Lawn" has been sent, for spring appearance.

READER'S DIGEST CALLS

Editor Calkins office called in late September, to verify Institute accreditation of the story done some time ago for the Reader's Digest Gardening Book, by Dr. Schery. Appearance is apparently scheduled for early spring.

TIME-LIFE PLANS GARDENING ANNUAL

Mr. C. W. Prendergast of Time-Life Books, telephoned the Institute seeking background information concerning lawns, for a "gardening annual" planned for publication during winter. The book, of course, will cover all aspects of gardening, and Mr. Prendergast was seeking from Dr. Schery information concerning lawns and lawngrasses. He has already received some Institute literature, including a copy of Lawn Keeping, and was anxious to have the autumn press kit as soon as available. We are pleased to have had a hand in shaping information going into a publication this influential a nature.

FOR RESORT MANAGEMENT MAGAZINE

The story "Lawn Troubles, Causes and Cures" was prepared in early September for winter appearance in Resort Management Magazine. In addition to a tabular listing of Variety Review Board acceptances, the story attempts to provide insight as to what may cause lawn problems. It suggests that the most effective means for countering trouble is to plant the new, specially bred cultivars such as are named in the table.

AN ASSIST FROM ARONSON

Earl Aronson, Associated Press, used Institute materials in his syndicated column, giving credit to the Institute. He states, "A big help in extending the lawn seeding season has been new turf-type perennial ryegrasses, such as Citation, Derby, Game, Manhattan, NK-200, Pennfine and Yorktown." He quotes the Institute as saying, "These are fast starting beauties capable of yielding green cover in only days if moisture and warmth are adequate." "Off-season seeding can be chanced because the ryegrass will grow fast enough to outdistance weeds and to establish well before change of season."

One of the problems for a columnist citing cultivars is how to respond to inquiries as to where the seed can be purchased. Should proprietors have a list of outlets handling their cultivars at retail, it would be well to have it on file at the Institute office. The best we could advise Aronson, inquiring where these varieties might be purchased, was to name the proprietors, and to give him a list of seed handlers who are members of the Institute.

SPRING SUPPLEMENT RECAP

We have now received the tally of photo requests for pictures accompanying the articles in the spring "Supplement" produced by Pflaum. The total appears to be lower than in previous years, with 406 total requests for 21 different illustrations. The least number of requests for any illustration was 15, the greatest 23, a very narrow range. The least number of requests for an Institute photo was 17, the greatest 21. A total of 130 requests were honored for Institute illustrations.

NEW GROUND COVER PUBLICATION

An attractive 26 page booklet entitled Ground Covers For North America, in the "Green Survival" series by the American Association of Nurserymen, was issued in late July. The Lawn Institute was responsible for the 10 pages devoted to "Turfgrass Ground Covers", with credit to Dr. Schery and the Institute.

The booklet opens with a version of the USDA Plant Hardiness Zone Map. Then various ground cover plants are listed according to zone, by both botanical and common name. Characteristics, care, and special points of interest are given in tabular form for each entry.

Because turfgrasses are seldom restricted to an individual zone, but depend upon many local and cultural factors, overlapping zones were considered in their presentation. Seldom is absolute cold (or heat) critical, and the area of greatest difficulty is often the so-called "transition zone" (zones 6 and 7 on the map) where neither northern nor southern species are fully adapted.

The opening paragraph in the turfgrass section reads, "Turfgrasses are among the most satisfactory of ground coverings for open space. Their basal growth permits constant defoliation (mowing) of the upper parts, allowing for convenient mechanized care. Selective herbicides make weeding easy. And in recent years the breeding of especially attractive, low-growing, disease-tolerant cultivars makes available many excellent selections suited to almost every taste."

An attempt has been made to place a copy of this interesting manual in the hands of all members.

COX ARBORETUM PRESENTATION

Cox Arboretum, part of the Dayton Montgomery County Park District, scheduled lawn discussions by Dr. Schery for Saturday, August 20. Attendance was by reservation, and the morning session was so over-subscribed that an additional afternoon session was added. The summer has been a very difficult one in the Miami valley of Ohio, with hot weather and drought killing out many lawns. Interest was intense, and many attendees brought dead turf, weeds, etc. with them as indicative of their problems.

The sessions opened with about 90 minutes of formal and theoretical discussion, followed by passing around lawnseed samples and answering questions, evolving finally into a general discussion that continued even through lunch break. The reprints "Curious About Cultivars?", and "Lawns and Their Tending" were distributed as a printed reminder. A reporter and a photographer from the Dayton newspaper covered the "event". Enthusiasm for new cultivars ran high, but again we are confronted with the problem of where the named varieties can be purchased locally (Ohio seed houses that are members of the Institute were mentioned, but none are within the Dayton metropolitan area).

APPRECIATIVE COMMENT

These kind words were received from Dorothy S. Young, Dorothy S. Young Associates, Penn., after mailing of the autumn press kit: "The press release which recently arrived - - - Fall 1977 - - - is so well prepared and filled with usable information that I am prompted to write about sources of lawn information in audio/visual form." Since "Have a Top-notch Lawn" became out of date, the Institute has not offered a slide set (nor a cassette), and has lacked the facility for this kind of service. But we can help out with slide loans and custom preparation under special circumstances.

PRESENTATION AT LONGWOOD

Dr. Schery has been invited to deliver the February 15 (1978) address at Longwood Gardens on lawns and their care.

LAWNS "CRITICIZED"

Arthur Ode, Director of Horticulture, New York Botanical Garden, writing in the Brooklyn Botanic Garden Handbook, "The Environment and the Home Gardener", adopts the increasingly popular theme that having a lawn is oftentimes ecologically unsound. One wonders if such writers have had any personal experience living in surroundings that are not maintained as a lawn? Actually, establishing and maintaining mowed turf has evolved into a fairly efficient system. And eventually less demanding grass cultivars will be bred! Expenditures of time and energy are no less, trying to live with what nature would bequeath if a lawn were not maintained, - brambles, aggressive weeds, and various nuisances. When Mr. Ode says, "Today's lawn cannot only be excessively consumptive of fossil fuels and fertilizers, but indiscriminate use of herbicides and pesticides can be both a health hazard and ecologically damaging.", it is misleading. The same would be true living with a regenerating forest (reaching climax would require at least a half century, in any event). While Mr. Ode is not incorrect, the slant is misleading. A rebuttal has been suggested to the Brooklyn Botanic Garden

"REBUTTAL" PLANNED

Fred McGourty, editor of Plants and Gardens "Brooklyn Botanical Garden" promises space in a forecoming issue to extend and counter the Arthur Ode story "The American Lawn and Its Alternatives", commented on above. McGourty writes, "Your points are very well taken and I don't argue with them. In fact, even Art Ode didn't when I called him".

It is interesting to have McGourty's viewpoint on a trend that we have seen shaping up ever since "environmentalism" gained popularity. He writes, "Now, my guess is that the next couple of years will see a rash of 'meadow gardening' articles in various magazines, with at least a hint of bias against lawns, and in the name of 'environment'. The subject has a great appeal for a growing number of 'natural' gardeners, mainly to almost-grown-up Pepsi generation who don't want to be tied down by the Draconian discipline - - - and who envision a pristine alpine meadow - - - in their backyard - - - no doubt partly inspired by TV ads for Maidenform bras and certain brands of cigarettes!" It's worth thinking about!

MORE ABOUT "FORGET THE LAWN"

Other mentions in this Harvests are reinforced by this quotation from the July issue of "News Views" (American Horticultural Society publication). One would suppose that serious horticulturists would not be caught up in such flights of fancy!

"Want to get out of doing battle with the lawn this summer? Then ignore it, let it grow naturally, and call it a meadow, a prairie, or even a native American grassland. You'll be right in step with a serious trend spreading across the country. It is creating what might be called ecological nature preserves of basic grasslands. "

PRESS KIT APPRECIATION

"I do an extensive amount of free lance gardening writing and would appreciate it if you would place my name on your mailing list to receive the excellent public relations material you publish", - Ann Reilly, New York.

TECHNICAL SECTION

RUTGERS 1977 PROCEEDINGS

As has come to be expected, the 123 page "Rutgers Turfgrass Proceedings" for 1977 contains many pertinent and interesting items. A number of papers are related solely to golf courses, and need not receive attention.

One of the most provocative discussions was by George Toma, grounds superintendent, the Kansas City Stadiums. He is a great believer in living grass, but is in charge of stadia utilizing mostly artificial cover. His analysis of the greater expense and difficulty with the artificial coverings is devastating, should one be looking for ammunition for promoting the use of grass on sportsfields. The special equipment, and the man hours needed, to mop up water, repair cigarette burns, clean off tobacco juice, etc. ad infinitum builds to astronomical proportions with the artificial surfaces. Even the original installation cost is about 10 times greater with artificial cover than with grass. About the only thing that can be said for artificial turf is that it can withstand constant use in a way that no living grass can.

Toma gives many interesting sidelights, such as preparing boxes of ice for players when they come into the dugout between innings of a day game. He also tells of many of the improvisations employed when the fields were in grass, back in the "good old days" of limited budgets. For one thing, he effectively switched from the baseball season to the football season by sowing 40 to 60 lbs/M of ryegrass, pre-germinated. Toma also mentions that he never experienced displacement of sod patching provided the sod was cut especially thick (2 inches or so).

It's a great discussion as "seen from the inside" on how onerous the maintenance of artificial turf can be.

Phillip Alampi, Secretary of Agriculture, gives an interesting review of attempts to keep portions of New Jersey permanently "green". One method, based on taxing authority, is to sell development easements to farmers, whereby authority passes to the state to have the land remain perpetually agricultural. This sort of thing is an idea whose time has come in crowded megalopolises.

Skogley gives his usual nicely-tailored recipe for preparing the ground for sodding. Bob Williams tells of the many interactions involved in golf course maintenance and administration.

Smiley, Cornell, provides a thorough discussion of Fusarium and its control, some of his premises being overly theoretical and unproven, but his ecological reasoning very intriguing. His reasoning is based upon the idea that Fusarium is always present, a normal (and generally useful) component of the microflora. It causes trouble only when the normal balance is unduly upset, the grass stressed. Fusarium is mainly a problem with bluegrass, and one suggestion Smiley has is to reduce the use of bluegrass, at least in areas where it is doubtfully adapted, or until better adapted cultivars become available. In general he is cool to the use of fungicides, feeling that they may eliminate other fungi that are antagonistic to fusaria.

Smiley dwells at length on the environment, and notes that optimal temperatures for fusaria are 75-82° F., while the optimum temperature for bluegrass is 60-75° F. (thus higher temperatures put the fusaria at an advantage). He notes that a south slope may be 20° F. warmer than a north slope, and that leaf temperature of the grass may be up to 40° higher than the air temperature. He indicates that Fusarium spores

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germinate best at a pH of about 3, with good growth at a pH of less than 5; yet Kentucky bluegrass (and microorganisms antagonistic to *Fusarium*) do best at a pH of 6-7. Also *Fusarium* grows well under dry conditions, whereas bluegrass (and the antagonistic microorganisms) prefer a moist environment. With a plethora of such interacting factors, it is easy to see that *Fusarium* disease control is a complex and difficult matter. There are some instances of build up of resistance to fungicides by *Fusarium*, although two new experimental ones are becoming available against which resistance is not yet evident (they are the non-benzimidazole types). One (E.L. 222) was phytotoxic to *Poa* in Smiley's tests, and perhaps it might be helpful for removing *Poa* from bentgrass golf greens?

Among other interesting observations Smiley notes: more *Fusarium* appeared on low mowed grass than on tall (no disease in the roughs, for example); no connection was apparent between thatch thickness, pH, soil moisture (although water stress did predispose the grass to increased disease severity), terrain, and disease. There was somewhat more disease where air movement was stagnant. Shading did not seem important, but disease was worse near physical barriers. Adelphi was resistant to *Fusarium* where interseeded into Merion (which was quite susceptible). In this instance the Merion fairways are being overseeded to other varieties and species (including Seaside bentgrass).

Duell, Cosky and Funk explore grass performance in shade. Surprisingly, the bluegrasses showed to better advantage than did the fescues in this series of tests. Also north and central sites were inferior to south, west, and eastern sites; exposure seems important. When grass is planted under trees, the kind of tree is important; beneath a densely shading cherry tree Kentucky bluegrass did well, but under a columnar Norway maple the bluegrass did not survive (but Chewings fescue did). Apparently tree root competition for moisture is influential. Some grass cultivars are better than others as to shade tolerance, although differences between the leading fescues and bluegrasses was not great in the tabular data. Merion was generally poorest in the shade, and Kentucky 31 tall fescue not much better. Over all Glade and Nugget bluegrasses seemed to be the best shade cultivars.

Niemczyk, Ohio, gave a thorough review of "The Identification and Life Cycles of Some Insect Pests of Turf"; numerous drawings serve to identify the pests and their behavior. Engle discussed a fertilization program to minimize *Poa annua*, involving as little fertilization as is possible to maintain the bentgrass in good condition.

Halisky evaluated systemic chemicals for stripe smut control, and is encouraged by a new product, Fenarimol.

Dale and Funk discussed hybrids between Kentucky bluegrass and Canada bluegrass. Results have been encouraging with P-167 (although on the Lawn Institute grounds this hybrid did not hold up well). Engel and Bussey discuss pre-emergence crabgrass controls, and of the commercial products found bensulide generally most effective (however, date of application had an influence on performance of many of the products). Butralin, Oxadiazon, and certain formulations of prosulfalin approach the effectiveness of bensulide.

An evaluation of perennial ryegrasses in New Jersey was undertaken by Funk, Duell and Dickson. Seasonal performance was checked, as were heavier and lighter fertilization regimens. Yorktown II, Diplomat, Omega, Citation, Derby, Yorktown, Birdie, Pennfine and Manhattan did rather well under all circumstances. Yorktown II, Yorktown, Manhattan,

Continued - - -

RUTGERS 1977 PROCEEDINGS - Con't

Diplomat and Omega were especially strong in the autumn-winter (due to brown blight resistance), while Yorktown II, Citation, Birdie, Diplomat, Omega, Derby, and Pennfine showed good summer performance (due primarily to above average resistance to *Rhizoctonia* brown patch). Of European introductions, Loretta (soon to be offered by Scotts) looked very good in spring, but was disappointing in late summer and autumn. Carvelle (to be advocated for southern golf green overseeding) was attractive during cool weather, but susceptible to hot weather damage. It was said in Europe that Scotts have chosen this for southern winter seeding precisely because it will not hang on during transition. It is interesting that in both the 1974 and 1975 seedings, Yorktown II led all other cultivars on average by a significant margin.

Other presentations were by Engle on dormant fertilization of turfgrasses (i.e. in winter), good for the turf but perhaps wasteful of fertilizer. For controlling thatch he suggests infrequent watering, low fertilization, higher mowing, proper pH, avoidance of pesticides to the extent possible, and, if at all possible, topdressing. Light thinnings to remove a bit of thatch at a time are suggested, frequently, rather than severe denudation which would make the lawn look bad for a prolonged period and perhaps allow entry of weeds.

A final symposium on topdressing deals mainly with composition of materials for golf greens, and discusses at length the value of straight sand as compared to a sand-organic material-soil mixture. New Jersey leans to the latter, although the mixture is predominately sand.

TURF ANNUAL APPEARS

The July issue of Park Maintenance magazine constituted its "Twenty-First Turf Research and Irrigation Annual". Other than an irritating sequence of misspellings and, grammatical uncertainties, this was one of the best of the magazine's annual reviews. Thanks goes chiefly to Drs. Turgeon, Illinois, and Goss, Washington, who effectively summarized the research for their regions rather than just citing a few reported details. The reports are heavy on cultivar evaluation, indicating this topic to be of no little interest these days. The research covered has already been epitomized for the "Annual", making it difficult to summarize it much further here.

Goss reports Fylking and other cultivars performing much better than Merion in California, especially where salinity is high. Kentucky bluegrass was on the whole slightly better than perennial ryegrass, but both of these species were far better than bentgrass and red fescue. As has been reported previously in Harvests, interestingly bluegrass ratings were higher in the warm season than the cool. Derby, Pennfine, Diplomat and Manhattan ryegrasses rated best.

An experimental herbicide caused increase in Fusarium roseum attack, causing unacceptable levels of the disease. However Bonnieblue, Parade and Adelphi were less affected, while Nugget and Fylking developed serious levels of the disease.

Rating well for general quality in Washington were Adelphi, Parade, Sydsport, Birka, Merion, Baron, Glade and Bonnieblue. However, two diseases (Entyloma and Septoria) ordinarily of little consequence began building up after two years. Among perennial ryegrasses Manhattan and Pennfine rated highest; among Chewings fescues Koket and Banner did well, while Highlight and Jamestown (considered creeping or spreading) rated well in their category. Emerald was one of five bentgrasses considered "best" out of 160. Research and selection goes on with southern species in California, and a strain of *Dichondra* resistant to nematodes has been uncovered.

TURF ANNUAL APPEARS - Con't

In Washington research continues on the usefulness of sulphur for improving turf quality and restricting Poa annua. A new fungicide has proven to give excellent control against snowmold.

Turgeon, reporting for the mid-west, notes that Dr. Keen, Kansas, has developed two winter-hardy bermudagrasses as well as an improved zoysia, due for release soon. Finer leaf tall fescues are due from Missouri, and a meadow fescue (Beaumont) has already been released from Michigan (has good winter hardiness, but seems to have poor wear and heat tolerance southward).

Increased information on Kentucky bluegrass and perennial ryegrass cultivars is accumulating, allowing more intelligent selection. Manhattan ryegrass exhibits better cold tolerance than Pennfine (making it preferred for the northern sections), while Pennfine has shown better summer performance than Manhattan (making it preferred for the southern regions). Pennfine proved more competitive than Citation in combination with Kentucky bluegrass, and of course differences in aggressiveness between bluegrass cultivars has become apparent. In some cases as much as 50% perennial ryegrass would be permissible in a mixture where a less aggressive ryegrass and an aggressive bluegrass were used.

Michigan research confirmed that abundant nitrogen encourages annual bluegrass, while in Illinois low-mowing and high-nitrogen encouraged Poa annua only with certain cultivars (Touchdown remained free of Poa annua, although Majestic and Nugget were heavily invaded). Moderate fertilization and high mowing were advantageous to tall fescue, and late season fertilization encouraged winter weed problems with bermudagrass in Missouri.

In Michigan Nugget, Glade, Parade, Sydsport and Baron have all shown fairly good shade tolerance. October fertilization was preferable to spring and summer feeding for best maintenance of Nugget in the shade.

In Nebraska moderate fertilization with potassium increased cold tolerance of tall fescue. But, while the 2-pound rate was beneficial, 4 and 8 pounds/M increased susceptibility to cold injury. In Missouri and Illinois increased mowing height increased thatch. Rates of fertilization had little effect on thatch formation in Illinois, but the amount of thatch varied greatly according to cultivar. In the four mid-western states reporting, biological thatch control was not effective (although there was some indication of thatch control in colonial bentgrass with Bio-dethatch in Washington).

In Illinois paraquat was retained on thatch during renovation, and reduced the new seeding; this was not the case with glyphosate. In Illinois thatch sometimes encourages injury to the turf where pre-emergence herbicides are used. A combination of silvex (2 lb./A) and endothall (1 lb/A) has proved effective for selectively eliminating bentgrass in Kentucky bluegrass. A new crabgrass preventer (prosulfalin) has proven effective, but sometimes injurious to the permanent turf.

Coats, Mississippi, provided the "Southern Update". He reports that last winter was disastrous for overseeding, especially with late seedings, due to persistent cold. An overseeding report from Texas A & M listed these ryegrasses as performing best: Citation, Manhattan, Pennfine, Yorktown, Derby, Omega, NK-200 and Diplomat. Others were significantly less satisfactory. Dawson fescue and Sabre rough bluegrass were superior to all perennial ryegrasses once established. Differences between the various perennial ryegrass cultivars has not been great.

Continued - - -

TURF ANNUAL APPEARS - Con't

Spurweed (Soliva) continues as an increasing problem in the southeastern section of the country. There is no good pre-emergence control, but success has been had with bromoxynil post-emergence. Goosegrass (Eleusine) is another continuing problem, although oxadiazon seems quite promising for pre-emergence control of it. Metribuzin in combination with MSMA seems to control goosegrass post-emergence, but can prove injurious to some of the improved bermudagrasses. In Arkansas wild onion (Allium) was effectively stopped by glyphosate applied to dormant bermudagrass turf.

Troll, Massachusetts provides the "Northeast Update". He cites good overall performance from Pennfine, Manhattan, Yorktown II, Citation and Derby perennial ryegrasses.

NEBRASKA TURFGRASS REPORT

The Proceedings of the 15th Annual Nebraska Turfgrass Conference was received at mid-year. Coverage was extensive (97 pages), mostly by University of Nebraska staff. A few of the highlights follow.

Sheerman et al reviewed Kentucky bluegrass cultivars in Nebraska. A brief report of this appeared in the last Harvests, citing cultivars with good resistance to Helminthosporium, comparative ratings of bluegrasses early after seeding and later (by which time the improved cultivars catch up), tendency towards winter damage (desiccation), quality ratings for cultivars (Majestic led), listings of cultivars that better withstand high temperature, comparison of water use of different cultivars, sod strength (Fylking and Majestic led in 1976), inhibition by compacted soil (Manhattan showed none; Sydsport, Merion and Fylking slight; Bonnieblue, Birka, Adelphi, Majestic and Nugget moderate; Park, Baron, Glade and common severe). Birka and Merion showed rather severe rust damage, others generally very little. Stem rust was almost invariably more severe on grasses growing on compacted soil than when the soil was not compacted.

Most of the prescribed fungicides helped control Fusarium on Kentucky bluegrass (Fungo was an exception), but control was not aided by concomitant aerification or application of wetting agents. Most recommended fungicides effectively controlled snowmold, but many resulted in some turfgrass discoloration.

Grass clippings were tested as a garden mulch and found quite useful. Dacthal (DCPA) was helpful in preventing spotted spurge, and glyphosate did well controlling pest grasses (better than paraquat). Timing had considerable influence on spotted spurge control, applications of dacthal made in mid-April proving best. Neither bensulide nor oxadiazon were quite so effective as was DCPA.

Carrow, Kansas, discussed soil compaction in the framework of golf course maintenance. A number of golf course superintendents spoke about particular problems as they saw them. There were, of course, pros and cons about Poa annua. Other papers dealt with golfing protocol.

Shearman reviewed mowing practices in a general way, and a number of presentations dealt with parks, sod, etc. Beard, Texas, spoke about the importance of turf, and one of his tables may provide good ammunition for turfgrass publicity. He noted that the daily maximum temperature on dry synthetic turf reached 158° F., on bare dry soil 102° F., and on green irrigated turf only 88° F. The differences 3 inches above the surface were not nearly so great, nor were nocturnal minimum temperatures, but they varied in the same direction. Knoop, Iowa discussed growing turfgrass in the shade.

NEBRASKA TURFGRASS REPORT - Con't

Vargas, Michigan, discoursed on diseases. While some of Vargas' conclusions are dubious, he is a firm believer in preventing disease by planting disease-resistant cultivars, and in this respect is a good ally for seedsmen. He lists Merion, Baron and Fylking as quite susceptible to powdery mildew, Merion and Windsor as very susceptible to stripe smut and Fusarium. Fylking, Nugget and Pennstar likewise suffer Fusarium. He singles out Adelphi, Majestic, Touchdown, Parade, Baron and Sydsport as resistant to "the big three" diseases (Helminthosporium, Fusarium, stripe smut). He suggests minimum fertilization to help control diseases, and of course chemical control for those willing to undertake the tedious, expensive procedures. He notes that resistance to the systemic fungicides is building up with Fusarium and other diseases, and mentions the drenching-in procedures needed for effective control of stripe smut with them. He suggests one exception to the use of improved cultivars, - low maintenance areas (roadsides, parks, general use areas, that will not be fertilized adequately). There Vargas would suggest common type bluegrasses.

RHODE ISLAND REPORTS

Skogley et al report on "Athletic Field Renovation Study" in the June, Rhode Island Turfgrass Research Review. Athletic fields constitute a problem for reseeding because of the constant use they receive from early autumn through spring, leaving only the summer months for repair. This study investigated whether using modern techniques of seeding, weed repression, and irrigation could successfully generate a turf during summer.

Using the new Rogers seeding drill (3" drill spacings) a turf that covered well was developed within the allotted time at very light seeding rates (less than 3 lb/M). Both preventive and post emergence herbicides reduced competition for the grass. Yorktown perennial ryegrass was seeded alone, and in combination with a blend of bluegrasses 50-50 and 25-75. The authors conclude that Yorktown ryegrass alone would be satisfactory, bluegrass in any percentage being doubtfully necessary (although counts showed bluegrass to have volunteered even when not sown). Bluegrass was about equally represented as Yorktown (in number of plants), when utilized as either 50% or 75% of the mixture.

In another review the composition of turf planted in 1905 at Rhode Island was followed until 1928. Under alkaline conditions colonial bentgrass did not hold up well, thinning to 20% of the original stand by 1916, and to 10% by 1928. The same grass, under acid conditions maintained itself at 80% and 70% respectively. Under alkaline conditions it was invaded and supplanted in large part by volunteer Kentucky bluegrass (40%). Red fescue was slightly favored by acid conditions, the alkaline plantings becoming more weedy. Redtop was lost completely within the first 11 years, changing over mainly to colonial bentgrass and red fescue under acid conditions, to bluegrass and fescue under alkaline conditions. The authors conclude:

1. In order of aggressiveness or persistence the grasses ranked as follows:
 - a. red fescue, fine-leaved fescue and velvet bentgrass
 - b. colonial bentgrass
 - c. Kentucky bluegrass
 - d. most strains of creeping bentgrass
 - e. redtop and crested dogstail
2. The fertilizers used were effective in producing healthy turf and a wide range of soil pH levels.

Continued - - -

RHODE ISLAND REPORTS - Con't

3. Bentgrasses are particularly tolerant of acid soils.
4. Kentucky bluegrass does not persist as well as the acclimated bents, especially under conditions of relatively high soil acidity.
5. Red fescue is an exceptionally durable grass on acid as well as on alkaline soil.
6. Acclimated velvet bent is an aggressive and persistent species and an excellent lawn grass.
7. Without fertilization, creeping bent shows a marked tendency to "run out" after a few years.
8. The number of weeds persisting is in inverse ratio to the degree of acidity; the higher the acidity, the fewer the weeds.
9. White clover volunteers most freely on soil having a slightly acid reaction.

VIRGINIA TECH TURF TOPICS ISSUED

In late August the Cooperative Extension Service of VPI released the second issue of Vol. 1, Tech Turf Topics. In it Harrison reviewed seed label information. His review of what the purchaser should look for on the label is fairly presented, and provides understandable discussion of various subtopics (inert, crop, weeds, noxious weeds, etc., in Virginia).

Robinson discusses the sod webworm cycle in Virginia, and illustrates the leaflet with several nice line-drawing illustration. He recommends an insecticide that will stick to the grass blades, applied about 10 days after peak activity of webworms flying over the lawn.

Taylor reviews turfgrass breeding in Europe, mainly as an outcome of his attendance at the Third International Turfgrass Conference. He emphasizes the registration lists used in European countries, noting that most breeding is done by private companies with the cultivars requiring expensive (fee) "proving out" under federal auspices. By name he mentions Enmundi, Kimona, and a few perennial ryegrasses as seeming to have good potentiality.

Hall winds up the series with a discussion of the especially ravaging heat and drought in many parts of Virginia this year. He discusses the theoretical reasons for lawn-grass demise, including susceptibility to normal pest attack by grass in a physiologically "weakened" condition. He mentions Vantage, Merion, Baron, Adelphi, Windsor, Kenblue and Georgetown bluegrasses as having above-average drought resistance in Virginia trials. He notes that ryegrasses and tall fescues retain their green color into drought periods better than does bluegrass, but theorizes that bluegrass may have better "staying power" because of rhizomes that fescues and perennial ryegrasses lack.

TEXAS RESEARCH

Departmental "information report" 77-54 was received from the Texas Agricultural Experiment Station in early August, courtesy of extension specialist Duble. Most of the coverage is peculiar to southern grasses, and will be of only cursory interest to many Institute members. It was a "rough" winter in Texas, marked by low temperatures that caused a great deal of winterkill (especially on 'Floritam' st. augustinegrass).

Potassium fertilization aided 'Tifgreen' bermudagrass rooting somewhat, but not 'Floritam' st. augustinegrass, as measured by increased number of actively growing roots. But potassium applications did improve the visual ratings of 'Floritam', although not of 'Tifgreen'. Tall fescue looks promising for shade plantings, establishes more easily

Continued - - -

TEXAS RESEARCH - Con't

than Floratam st. augustinegrass (which won't spread from plugs). Floratam killed much more rapidly than common st. augustinegrass from winter cold, especially in the shade, and if highly fertilized.

Fungicidal treatment of seed (used for northern grass winter overseeding) only occasionally resulted in phytotoxicity, but also seemed to have little value. Winter-seeded perennial ryegrasses were mostly similar in tolerance to wear, with Caravelle, Birdie and Manhattan slightly better, Yorktown II, Palo, NK-100 slightly poorer. A few Chewings fescues and Sabre rough bluegrass provided superior wear performance, approaching that of the perennial ryegrasses. Raising the cutting height helped with Tifgreen, but made no difference on Tifway; moderate fertilization helped wear with Tifgreen (heavy fertilization reduced wear), but fertilization made little difference on Tifway.

Most of the commercially available perennial ryegrasses were compared for winter overseeding, with the differences between them slight. Heading the list were Citation, Pennfine, Derby, Manhattan, Yorktown. Sabre bluegrass, and Dawson Chewings fescue, were on a par with the ryegrasses.

OHIO MISCELLANEOUS

The Ohio Turfgrass Foundation newsletter received in late July reviews a number of research projects under way. The mode of Helminthosporium disease attack is being studied, and related to cultivars. The effectiveness of nematocides is being studied; so far, available products show scant usefulness, with or without wetting agents.

Several studies point up the resistance of insects (especially Japanese beetle) to the familiar chlorinated hydrocarbon insecticides. A new release, funsulfothion (Dasanit) is proving effective as well as the "experimentals" (CGA-12223 and bendiocarb). Incidentally these insecticides are not readily bound to the thatch, but do require soaking in to reach the target. Research indicates that chlorpyrifos (Dursban) and diazinon are quite strongly absorbed on thatch.

The familiar insecticides prove to reduce earthworm populations, and thereby probably encourage thatch. Calcium arsenate and bandane are the most persistent repressants. These and dieldrin caused greatest increase in accumulated organic matter.

Basagran has been hailed at Ohio State for selective efficiency in eliminating nutsedge. It has now been approved for labeling for use on commercial turf (turf other than home lawns, for which label clearance is still not had). Basagran is not recommended during drought or cold weather, nor when rainfall (or irrigation) is likely to wash it from the leaves for a period of 6-8 hours. A single application of 0.75 to 1.5 oz. per M has provided total control of nutsedge, with no phytotoxicity to any of the desirable lawn species (although seedling grass will likely be injured).

UF-IBDU TURF FERTILIZATION COMPARED

Wilkinson, Ohio, reports in the July-August Agronomy Journal on comparisons between UF fertilization and IBDU. He found no difference in response whether the product was coarse or fine. Single spring applications of IBDU gave poorer initial response than UF, but better response than UF at low temperature in autumn. Relatively little difference was noted between the two during the summer months if applied at the same rate. In general IBDU should be applied more frequently than is necessary with UF, but may be slightly more efficient measured by total N uptake.

SEEDING FOR SOD IN THE TRANSITION ZONE

Hall, Virginia, presented at the International Turfgrass Conference data covering several years of investigations of Kentucky 31 tall fescue (90%) common Kentucky bluegrass (10%) accumulated mainly from 1973 onward while at the University of Maryland. Tall mowing (3 inches) aided the tall fescue component and also restricted crabgrass invasion of the sod. Autumn fertilization conferred some advantage on the tall fescue, spring fertilization on the bluegrass. Early autumn or spring seeding was advantageous to the tall fescue, late autumn seeding to the bluegrass. Tall fescue content was not affected by light rate fertilization, but quality of the sod was (making it less acceptable to consumers). Rooting of the sod after transplanting was mainly dependent upon the tall fescue through summer; fertilization helped.

HYDROSEEDING OF BERMUDAGRASS

Research reported by Kay et al, Nevada, in the July-August Agronomy Journal, indicates that very little damage occurs to bermudagrass seed from agitation in a hydroseeding machine (used for seeding roadsides). Pre-treatment of the seed prior to hydroseeding, such as soaking in water, in potassium nitrate, or treating with growth regulators (gibberellins or kinetins) had slight advantage.

GRASS RESTRAINS NITROGEN POLLUTION

Research by Chichester, Ohio, reported in the April-June Journal of Environmental Quality, shows that both runoff and percolation water from a meadow (containing bluegrass and other grasses plus alfalfa) carried very little dissolved nitrogen compared to runoff and percolation from a typical (heavily fertilized) corn field. The study bolsters information that lawn fertilization seldom has any polluting effects. As would be expected, nitrogen loss in runoff was greatest when intense rainfall shortly followed fertilizer application. The nitrogen loss was less than 1 kg/ha per year for the meadow, ten times as much for cultivated corn. Nitrogen leaching was greatest in winter (when percolation was greatest), and was less than ten kg/ha per year for meadow (less than the 10 ppm. level the U.S. Public Health Service recommends for potable water); leached nitrogen was more than 25 times as great under corn (exceeding the standards for potable water sevenfold).

ATTEMPTS TO DISTINGUISH CULTIVARS CONTINUES

Nittler and Kenny, N.Y. (Geneva), reports in the July-August Agronomy Journal on continuing efforts to distinguish bluegrass and ryegrass cultivars as seedlings. Previously red coloration of the leaf sheath proved to identify certain cultivars from others, but not each cultivar individually. Pursuing this line of investigation the authors grew seedlings in varying ratios of ammonium-nitrate nitrogen. The percentage of ammonia had some influence upon the degree of red coloration with certain cultivars. They conclude that it may be necessary to use differing ammonia-nitrate ratios for the screening of particular cultivars.

HERBICIDES AND PLANT COMMUNITIES

Tomkins and Grant report in the "Early Spring" issue of Ecology, on investigation of plant communities after being treated with a number of familiar herbicides (including 2,4-D, Picloram, Paraquat, Simazine, Diuron and certain combinations of these). As would be expected the auxin herbicides benefited the grasses, and produced a simplified community (exactly what is sought in lawn maintenance). Non-selective herbicides sometimes resulted in a simplified community, but with no particular benefit to the grasses. Simazine showed long-term detrimental effects on grass.

SEED GERMINATION

Baskin and Baskin, Kentucky, reporting to the annual meeting of the Ecological Society, note that some (ragweed) seeds buried for 40 years germinated if tested in early spring, but not if tested later in the year. Apparently seeds not germinating in spring enter a secondary dormancy for the rest of the year. Might not the same mechanism affect lawngrass seeds (or weed seeds) long buried in the soil?

LAWN GRASS SEEDLING COMPETITION

Engle and Trout, New Jersey, presented an informative paper on how one turfgrass competes with another during the seedling stages at the Third International Turfgrass Conference. Red fescue proved consistently more competitive than either bluegrass or colonial bentgrass. Ryegrass severely repressed other species, but redtop was not nearly so repressive. Bluegrass seemed most hindered by competition, but it eventually gained ground if seeding rates were not too heavy (by the fourth year it may gain dominance with any reasonable start). This research supports recent contentions that fescue is unduly competitive in mixtures, and the long-realized difficulties from ryegrass in mixtures (especially at heavy seeding rates).

PRE-EMERGENCE ANNUAL GRASS CONTROL IN THE SOUTHEAST

Johnson, Georgia, reporting in the May-June Agronomy Journal, notes the generally less-than-perfect control of crabgrass and *Poa annua* with pre-emergence herbicides. In the study reported, DCPA (Dacthal) was inconsistent, with a two-time (March and June) treatment giving best results. The crabgrass problem is greater with an early spring, suggesting that much germination occurs before a crabgrass preventer is applied (emphasizing the need for early treatment).

ADVANTAGES FROM NITROGEN FERTILIZATION

Pinder, Georgia, in a presentation to the annual meeting of the Ecological Society, notes that nitrogen enrichment markedly influenced both productivity and diversity in old-field vegetation. The ecological principles should apply equally well in lawns, - e.g. nitrogen fertilization (up to about 2 lbs./M) will about double the biomass (vegetational cover) and depress or eliminate subordinate species (normally less common grasses or weeds).

OBSERVATIONS ON THATCH

Murray and Juska report in the May-June Agronomy Journal concerning research on thatch accumulation by common Kentucky bluegrass. Clippings did contribute to thatch (after 5 years), but the highest quality turf resulted when clippings remained (helped avoid temperature and moisture stress). Even after 5 years the clippings did not contribute to thatch if the turf was aerified. Liming (of a normally acid environment) to near neutral helped reduce thatch, and aerification further helped in its decomposition. Wetting agents were not useful, and the addition of an organic fertilizer (Milorganite) increased thatch. Leafspot disease was reduced by aerification, wetting agent, and clippings removal. No significant difference in thatch level was noted between the control and most treatments 14 months after the practice was discontinued.

GRASS GROWTH RETARDANT

Elkins et al, Southern Illinois, report in the May-June Agronomy Journal, on the effect of chemical growth retardants on turfgrass. Their conclusion is that retardation of topgrowth invariably restricts other aspects of growth (such as roots, rhizomes, tillering), and for this reason can be detrimental to long-term performance and care requirements.

CULTIVARS IN EUROPE

When attending the Third International Turfgrass Conference, Dr. Schery inspected numerous trial grounds where hundreds of cultivars are being compared, frequently including Institute proprietaries. Visiting two or three trial grounds daily over a number of days tends to "blur" impressions. In any event at time of visit (early July) performance might be different than at another season, affecting over-all ratings. Nevertheless, for what it is worth, here are a few of the notes concerning cultivars that might be of particular interest to Institute sponsors.

University at Bonn, Dr. Boeker - Forty eight pages of test layouts were distributed, obviously too much to absorb at one visit. It was noted that with the 1971 plantings, very many had given way to Poa annua or other volunteer growth. 'Eagle' (Zwaan and de W.) appeared to be one of the best bluegrasses, as was also 'Sydsport'; 'Fylking' was also satisfactory. Fine fescues were much alike, with 'Jamestown' as good as any to judge by the 1974 plantings. Judging by the 1975 plantings, 'Derby' was the best of the perennial ryegrasses, while 'Merion' was good among the bluegrasses, but 'Ram I' not so good. In the 1976 plantings there was not a great deal of difference between the perennial ryegrasses, but 'Pennfine' was not as good as 'Derby'; among the bluegrasses 'Touchdown' was one of the best, 'Adelphi' fair.

Büchner Sod Farms, Alsbach - Two planting mixtures were emphasized: one of them was 25% 'Loretta' perennial ryegrass, 20% each 'Baron', 'Parade' and 'Merion' bluegrasses, 10% 'Enmundi' bluegrass, and 5% 'Lifalla' Chewings fescue. The other was 25% 'Merion', 30% each of 'Parade' and 'Baron' bluegrasses, and 15% 'Dawson' spreading fescue.

Wolf-Geräte, Betzdorf - Of the bluegrass plantings made in 1974, 'Kimono' was a stand-out; 'Nugget' very good too. Among the perennial ryegrasses, 'Yorktown' was best, 'Loretta' second best, with 'Pennfine' and 'Manhattan' pretty good. Among the fescues, a cultivar called 'Belmonte' was perhaps slightly the best, with 'Jamestown' not far behind. 'Penncross' was one of the best bentgrasses, but 'Kingstown' and 'Exeter' not good; some plantings of 'Highland' were good, others poor. In the 1976 plantings there was rather little difference between the ryegrasses, with 'Diplomat' very good, also 'Manhattan', 'Loretta', 'Citation', 'Derby' and 'Yorktown' (Yorktown is said not to hold up well). Among bluegrasses, 'Enmundi' was excellent, 'Merion', 'Fylking', 'Glade' and 'Parade' pretty good, 'Adelphi' fair. In the older ryegrass plantings (1972) 'Manhattan' has held up best; 'Pennfine' is being invaded by Poa annua. In mixture comparisons (ryegrass, bluegrass, fescue) it appeared that the fescue ('Lifalla') was winning out no matter the percentage used.

University at Giessen, Dr. Skirde - Judging by pure stands of bluegrasses planted in 1974, 'Nugget' was very good, except that it wore poorly (abrasion roller). 'Kimona' was best, and wears well too, with 'Parade' not far behind. Good, but somewhat less satisfactory, were 'Baron', 'Fylking', 'Birka' and a few cultivars not familiar in this country. 'Merion' was fair and 'Enmundi' poor (as was also 'Skofti', often thought highly of in Europe). Fine fescues were being tested for salt tolerance, and 'Dawson' was far ahead of others. 'Skofti' among the bluegrasses seemed most salt-tolerant. 'Pennfine' and 'Loretta' ryegrasses seemed reasonably salt-tolerant and the tests as a whole suggest that cultivar differences are more important than species differences with respect to salt tolerance. In other tests, as with fertilizer to prolong the growing season, 'Enmundi' was one of the best of the bluegrasses, 'Loretta' a little better than 'Manhattan' among the perennial ryegrasses.

At Steinach, Straubing - 1975 plantings, 'Pennfine' and 'Loretta' were the best of the perennial ryegrasses, followed closely by 'Manhattan', and a few others. Among the Kentucky bluegrass, 'Kimono' and 'Parade' were very good, 'Enmundi' pretty good, 'Baron' fair, 'Sydsport', 'Windsor' and 'Merion' not good. 'Emerald' was fair among the

CULTIVARS IN EUROPE - Con't

bentgrasses, 'Highland' not good. Among the fine fescues 'Atlanta', 'Dawson', 'Koket' and 'Jamestown' were all very good, 'Highlight' fair, 'Ruby' and 'Novarubra' not good.

University at Freising-Weihenstephan - For plantings made in April of 1974, among the bluegrasses 'Baron' was very good, as was 'Enmundi' and 'Eagle'; 'Fylking' was satisfactory, 'Windsor' no good. Among the ryegrasses 'Manhattan' was good. In the June 1976 planting 'Skofiti' was the best bluegrass, with 'Baron' and 'Sydsport' good ('Sydsport' said to be aggressive), 'Parade' fair, 'Enmundi' in bad shape (overrun with Poa annua).

Government, at Eder Am Holz - The 1974 bluegrass planting, given spike roller treatment, had turned mostly to Poa annua. The 1975 planting showed the bluegrasses and fescues to be much alike, with mild Poa annua invasion. Among the perennial ryegrasses 'Score' was best, 'Derby' not doing too well. 'Caravelle' (said to be Scott's choice for winter-seeding in the South) looked very bad, having no heat tolerance (the reason for its choice as a temporary cover for winterseeding). In the 1976 sowing, 'Touchdown' looked best among bluegrasses (but was said not to stay green through winter); 'Adelphi' was good; 'Highlight' and 'Dawson' fescues were good, all fescues much alike. Among the perennial ryegrasses 'Diplomat' was as good as 'Loretta', 'Yorktown' not too good. In the 1974 sowing for athletic field performance 'Kimona' was the best bluegrass, followed by 'Nugget', 'Enmundi', 'Baron', 'Fylking', 'Birka', 'Sydsport'; 'Merion' and 'Windsor' were only fair, considerably invaded by Poa annua. The perennial ryegrasses seemed to mow rather poorly, with 'Loretta' perhaps the best looking, followed by 'Manhattan' and one or two others.

Government trials, Lusignan, France -

It is recognized that ryegrass wears better than other species, including red fescue, but red fescue is perhaps favored because ryegrass suffers rust. 'Highlight' and 'Dawson' fescues looked good, but 'Highlight' is said to wear poorly on football fields. It is said that the bluegrasses suffer much from Helminthosporium through winter. 'Parade' and 'Birka' looked good in the bluegrass comparison, 'Kimona' and 'Fylking' not quite so good, 'Majestic' and 'Adelphi' fair, 'Baron' a little on the poor side. The French seem to like some Phleum bertolonii in athletic field mixtures, since it is said to wear so well.

Vilmorin, la Menitre - In general bentgrasses were doing poorly, but tall fescue seems to be liked with many cultivars under test. Among perennial ryegrasses, both 'Manhattan' and 'Pennfine' were considered "ordinary". Fine fescues tended to dominate mixtures, without a great deal of difference between cultivars ('Highlight', 'Dawson', 'Jamestown', 'Wintergreen' and 'Menuet' were all as good as anything). Among the bluegrasses 'Kimona' was good, but not the best; 'Birka' was not too good, suffering from rust; 'Fylking' was good, but also had rust; 'Kenblue' was poor, overrun with crabgrass. Among the bluegrasses 'Manhattan' was one of the best with 'Majestic' and 'Idole' a bit better. 'Game' was poor.

RESISTANCE TO INSECTS

Boutton and Cameron, University of Houston, in a paper before the annual meeting of the Ecological Society, explore the hypothesis of whether insects avoid C4 plants ("warm season" species, crabgrass, etc.) more than C3 grasses (such as the conventional northern lawngrasses). No significant difference was found, although a trend did show heavier utilization of C3 species (especially by Homoptera and Diptera insects). Such interactions are only beginning to be explored, although of possible usefulness in breeding insect-resistant turfgrasses.

PAPERS PRESENTED AT THE THIRD INTERNATIONAL TURFGRASS CONFERENCE

Ninety five research reports were formally presented at the Third International Turfgrass Conference, Munich. Most will appear eventually in the Proceedings of the conference, to be published sometime in 1978. Many of the papers have no interest for Institute members, dealing with such matters as local soil conditions, weed control, etc. But a brief sampling will give an idea of the range of coverage.

Shildrick, Bingley, England, emphasised the importance of perennial ryegrass for good wear tolerance; used also in seeding mixtures have been 'Baron' Kentucky bluegrass, a Welsh timothy, 'Highlight' fescue, and 'Highland' colonial bentgrass.

Panella, Italy, pointed out that his country is only beginning a program of turfgrass research. Turfgrass seed has been imported from northern Europe and from the United States (400 tons of red fescue seed annually, 200 tons of bluegrass, 100 tons of bentgrass). Oftentimes the seed from northern Europe is not well adapted, and that from the United States, although generally better, is less than perfect. Volunteer plants picked up throughout Italy offer a better selected germplasm. Tremendous climatic variability exists in Italy, which Panella likes to compare (probably mistakenly) with the Pacific states.

Duich and his colleagues at Penn State University emphasized the great superiority of Manhattan perennial ryegrass when used as a "nursegrass" in mixtures, compared to common types of perennial and annual ryegrass. 'Delta' bluegrass competed against the ryegrasses better than did 'Merion' and 'Pennstar' in the seedling stages, but subsequently 'Merion' and 'Pennstar' provided the superior turf.

Humphreys, Liverpool, England, feels that many unexploited ecotypes of various turfgrass species occur in England, that could yield superior cultivars for the English climate. Minderhoud, Netherlands, suggests that there are two special types of tillers in perennial ryegrass, one of which consists of elongated vegetative shoots which can root and produce secondary tillers (thus making ryegrass to a degree "spreading").

Gibeault, California, reporting on the cutting quality of perennial ryegrasses, found that some varieties ('Lamora', 'TK4100' and 'Pelo') did not clip well, but others exhibited cutting quality that varied with the rate of seeding, and to some extent with fertility.

Several papers looked into Poa annua qualities, the "supina" type having been considered in Germany as possibly useful for athletic fields; Bryan and Adams recorded a considerable range of characteristics with Poa annua in Wales and western England.

Murray and Foy, Beltsville, checked cultivar performance at differing pH regimes. There was considerable difference between Kentucky bluegrass cultivars, less between tall fescues and fine fescues. Fylking tolerated acid soil, but scarcely grew at a pH of 4.1 (its maximum growth was at 7.6). 'Kenblue' was very poor below 5.5. Murray considered both 'Merion' and 'Kenblue' as sensitive to acidity, 'Fylking' and 'Victa' as tolerant. A pH of 7.6 was bad for 'Kenblue', but ok for 'Fylking'. He considers a pH of about 5.7 as a "breaking point" all cultivars considered, below which many cultivars will experience difficulty.

Audy, France, spoke about seed production in France. So far there is rather little, and about 90 metric tons of fine turf seed are imported annually. Collections are being made of local germplasm.

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Bourgoin, France, notes that very few cultivars will survive in shade. Fescues and Poa trivialis last longest, but almost anything becomes invaded by Poa annua in time (the Poitiers-Angers area).

Youngner, California, has found significant differences in tolerance to ozone between cultivars; this suggests that breeding cultivars to resist air pollution should be possible. White and Smithberg, Minnesota, discuss winter hardiness of turfgrass. Bentgrass, in their tests, generally developed the greatest tolerance to cold, followed by bluegrass, fescue, and ryegrass. The hardest creeping bentgrass was 'Toronto', tolerating -52° C. in January. 'Baron' was the hardest Kentucky bluegrass, tolerating -48° C., 'NK-200' was the hardest perennial ryegrass, tolerating -36° C. All cultivars tested were least hardy in late spring, most hardy in mid-winter.

Kaerwer and Associates, Minneapolis reviewed tolerance of turfgrass cultivars to salt. Fine-leaf fescues exhibited the broadest range, with 'Dawson' and 'Golfrood' the most resistant to high salt concentration. 'Nugget' Kentucky bluegrass is the most tolerant of the commercial cultivars. Of course the alkali grasses from Colorado State University are exceptionally salt-tolerant.

Shoulders and Schmidt, Virginia discussed overseeding of bermudagrass for winter sports. Perennial ryegrass generally proved best, fescues not competing well with Poa annua. Bentgrass alone was not satisfactory, and Poa trivialis disappeared rapidly in spring. 'Manhattan' showed a bit more leaf shredding than either 'Pennfine' or 'NK-200', but nitrogen applications reduced shredding in all cultivars. 'Derby' rated highest, followed by 'Citation', 'Pennfine', 'Yorktown', 'Manhattan' and 'NK-200' in the ratings. Many additional papers touched upon cultivar performance, grass physiology, weed control, etc., which space does not permit commenting upon here.

BAD PRESS FOR ARTIFICIAL TURF

More derogatory press on the use of artificial turf for athletic fields received first page attention in the Friday, September 23, St. Louis Post Dispatch sports section. The headline reads, "Busch Rug Called Player Hazard", "Busch" being the name of the stadium. The playing surface was Monsanto's "AstroTurf". Its surface seems to be tearing, turning rock hard, coming loose, and whatnot. Four colored pictures with the full page article emphasize the miserable condition. In considering repairs or replacement, one of the alternatives is a return to natural grass (the Purdue PAT system). A few quotes from the article may be instructive:

" - - the cracks, seams, smooth-as-glass nap and hard-as-brick padding are treacherous hazards to the well-being of professional athletes."

"Busch Stadium's AstroTurf has no peer when it comes to boobytraps - a player always has been wary of getting a foot jammed in a seam or tripping over a bump".

"The field is definitely bad all over, - - but what gets me is the hardness of it. It doesn't have any spring. My legs are always feeling like they're dead. The joints are constantly jamming. I'd rather play on dirt".

"The outfield gets too hot during the summer, line drives skip off the turf like bullets and outfielders have a helluva time avoiding the seams with their spikes."

These are just a few of the devastating comments made in the article, and the surface may soon go the way of that at the University of Minnesota stadium where the 3M artificial surface was replaced with natural grass.