

## BETTER LAWN -- HARVESTS

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### NEW OFFICERS BEGIN FISCAL YEAR

Following the annual meeting, Norman Rothwell, Lindsay, Ontario, assumed the Presidency of the Institute, has been hard at work with Institute administrative affairs. In addition to such routines as letterheads, signature cards, and so on, Mr. Rothwell has been consulting with the Executive Committee about Norlea perennial ryegrass acceptance, as called for at the annual meeting. Vice President Bob Peterson, of Forest Grove, Oregon holds forth in the Pacific Northwest, while Secretary-Treasurer, Bob Russell continues to deal willingly with such details as billings, payroll and taxes. We are pleased to have so able a team taking charge.

### PRESS KIT WORK BEGINS

Late summer and autumn are none too early to begin compilation of materials for spring press releases. This is especially the case when in-season photos are needed, as for the "Supplement" (the joint venture with several other associations, sponsored by the Institute and the Lawn and Turfgrass Division of the American Seed Trade Association). Usually Pflaum Associates, producer, wants materials in hand by late October, so that the necessary in-house work can proceed through winter and editing be completed for early next year.

The Institute's own press kit follows a similar scheduling, although we can control timing a bit better being independent of others. For one thing Dr. Schery likes to await presentations at the American Society of Agronomy meetings, for any new ideas that might come along that can be utilized. Still, advisories on seeding, mention of cultivars, and a rounding out of coverage suited to our clientele needs to be prepared well in advance, in order to estimate production requirements. With costs rising so fast, we try to take advantage of volume production with envelopes, folders, and other accouterments of the press kit, yet avoid loading ourselves unduly with inventory.

### "BAD SUMMER" MAY SPUR SALES

Doyle Jacklin reminds us how widespread drought and the exceptionally hot summer has been, from Texas to New England. Mr. Jacklin feels a good deal of lawn refurbishment will be necessary, a lot of it carrying over into spring since autumn weather did not "break" soon enough for normal September plantings. The spring press release will nurture this theme, reminding readers of 1980 weather, and suggesting early spring seeding or sodding with topflight cultivars for immediate repairs.



#### CULTIVAR LISTING UPDATED

A story was prepared for Seedsmen's Digest for appearance shortly, entitled "Lawn Cultivar Update". This follows somewhat the pattern of a story done a few years ago for the same magazine that was widely utilized for providing thumbnail sketches of Variety Review Board cultivars. The function of the Lawn Institute's Variety Review Board opens the presentation, followed by the presentation of Cultivar Acceptances. This should provide an up-to-date listing for handout and inquiry.

#### STORY READIED FOR HORTICULTURE

An article tentatively entitled "Spring Lawn Strategy" has been prepared for Horticulture magazine. The story deals with the promise of springtime, and advantage of early seeding. Chief attention is given to repairing thin turf, promoting lawn vigor, and thwarting weeds. A table listing Variety Review Board cultivars is included, and "By all means consider modern-day cultivars" advised.

#### AUTUMN STORY APPEARS

An Institute story done for The Country Gentleman, entitled by the editors "Fall for Your Lawn", appeared in the autumn issue. The article dealt basically with advantages of autumn feeding and seeding, with lengthy discussion of weed control. New specialty grasses for "tough situations" were characterized, and methods for successful planting outlined.

#### CONFERENCE CALL TO NEW CASTLE

John Nuzzo, WKST in New Castle, Pennsylvania, recipient of Institute press kits, telephoned asking if Dr. Schery would participate in a "conference call" Thursday, August 14, broadcast from WKST studios. WKST was also sponsoring a booth at the Lawrence County fair, where Institute reprints were given out ("Has Turfgrass Development Plateaued?", "How to Handle your Lawn in Summer"). We were delighted to cooperate in receiving inquiries about autumn lawn seeding via the long-distance connection. Approximately half an hour was spent at the telephone, and additionally Mr. Nuzzo offered reprints to the radio audience if a stamped envelope were sent to the Marysville office (an announcement repeated several times during the program).

#### AUTUMN STORY APPEARS

The August issue of Flower and Garden magazine carried the Institute's story, "Lawns 'Blossom' in Autumn - - -". The item calls for fertilization in autumn, pointing out it is "nature's way" to feed lawns then for a good beginning of the growth cycle. A boxed insert entitled "A Few Modern Lawnseed Cultivars" carries a listing of the Variety Review Board selections superimposed upon a photograph of mulching lawns in autumn.

#### INSTITUTE BOOK REVIEW APPEARS

The August issue of HortScience carries the book review of Turfgrass Management authored by A. J. Turgeon and illustrated by Floyd Giles. This book was discussed in the April 1980 Harvests, and is favorably reviewed in this HortScience. Dr. Schery summarizes his review, "The author, illustrator, and publisher are much to be commended upon the consistent quality of the publication."



## LAWN SEED DISPLAY AT COX ARBORETUM

Susan Rogers, Cox Arboretum, Dayton, Ohio, telephoned asking the Lawn Institute's assistance for an autumn informational program at the Arboretum. In years past Dr. Schery had conducted seminars at the Arboretum just ahead of the autumn lawn seeding season. Ms. Rogers was anxious to have seed, grass started in the greenhouse, and literature available for display.

Immediately dispatched to Cox were a few grams each of the major lawngrass species, - enough for vials of seed to show type and size, as well as to make greenhouse plantings. In addition a large assortment of reprints and the leaflet "Lawns, Across America" were included.

## LAWN SEED INDUSTRY REVIEW

The July issue of Weeds, Trees and Turf, awaited expectantly, carried wide-ranging discussion of the lawnseed industry, much of it of an historical nature. The treatment was remarkably comprehensive, considering that it was apparently an in-house effort by editor Bruce Shank, a journalist more than an expert in the turfgrass field. Some awkward expressions, inaccurate spellings, and occasional contradictions did result, but the overall effort was commendable, and a "first" in bringing together a wealth of information about this particular, specialized subject. The stories are attractively illustrated, often with drawings (both in color and black-white) taken from photographs, as well as with photographs themselves.

Shank talks first about "The Early Years", - Fred Grau, the USGA Green Section at Arlington under Montieth, and the pioneering works of DeFrance, Valentine and early academicians (principally at Pennsylvania State University). This is followed by a second section, "The Formative Years", in which a fine color spread of Arden Jacklin examining a seed field in 1958 leads off. Several photos concerning traditional midwestern harvesting of bluegrass borrowed from the Lawn Institute are utilized in this section, also.

The third section, "The Seed Company" opens with an Institute picture of President Bill Cassner and Vice President Ed Spears shaking hands at a Kansas City annual meeting upon assuming office. Many past and present luminaries of the seed industry (and the Institute) receive deserved acclaim in this section.

"The Breeder" and "Improved Turfgrasses" follow, the latter section is organized according to the species of turfgrass. Prominent breeders are generously profiled, including Variety Review Board chairman, Jerry Pepin. A section on "The Grower" ensues, after which "Certification and Marketing" are discussed, and "Variety Protection" is reviewed. Institute firms and cultivars thread throughout the discussions.

As the first part in the new "Turf Management Series" this issue of Weeds, Trees and Turf fulfills its promise of providing a well-rounded backdrop pointing up how far the industry has come so rapidly.

## APPEARS IN GARDEN WRITERS BULLETIN

This announcement appeared in the June issue of the Garden Writers Bulletin (Garden Writers Association of America):

"Robert W. Schery, Director of the Lawn Institute, reports that the Lawn Institute's Variety Review Board has just updated its acceptance list of cultivars. Although space does not permit publication in the Bulletin, the revised listing with brief, thumbnail descriptions is available by sending a stamped, self-addressed envelope to the Editor (see page 2)."

It is nice to have this assistance in getting the word around.



#### NEW DISPLAY PLANTINGS AT MICHIGAN STATE

A request from Dr. Kenyon Payne, Michigan State University, asked for one pound samples of cultivars the Institute would like to have entered into the planting program at the new turfgrass research field laboratory. The laboratory building has been completed, and the irrigation system installed during summer. Cultivar plantings were planned for August. The Institute stocks most Variety Review Board cultivars, and one pound samples of all on hand were offered to Dr. Payne if he does not already have them.

#### LAWNS SAID TO BE MORE WORK THAN GARDEN

The summer issue of Gardens For All News contains a short reference to John Falk (of whom we have spoken previously in Harvests), and his calculation of energy inputs in lawn keeping. Falk is quoted as saying that it cost more in energy to maintain a lawn than a garden. Specifically, 173 kilocalories is spent per square foot of lawn per year, approximately twice what would be needed per square foot with a small garden. Falk is reported to say that a lawn produces more plant matter than a coniferous forest, and that the typical lawn contains from 30-50 different kinds of grasses and weeds.

#### INSTITUTE PHOTOS REQUESTED

Marjorie Dietz, preparing a gardening magazine for the newstands, has requested illustrative material from the Institute. Of course credit will be prominently given for any photos utilized.

#### SEEDSMEN'S DIGEST MENTION ITEM

The July issue of Seedsmen's Digest carried the item, "Experts on Lawn Institute Variety Review Board". The criteria for choosing nominees are discussed, and the cultivars accepted by the Variety Review Board are cited by name.

#### UNSOLICITED KUDOS

Cora Harris, Charlotte, N. C., took pains to mail back our covering letter of the autumn press kit, with a hand written salutation, "Excellent and helpful!". We appreciate the encouragement.

#### INSTITUTE ANNOUNCEMENT

Announcement of the Lawn Institute's annual meeting, and election of new officers, was carried in the September issue of Weeds, Trees and Turf.

#### INSTITUTE ANNOUNCEMENT IN SEEDSMEN'S DIGEST

The August issue of Seedsmen's Digest carried mention of the Institute's annual meeting in San Diego under the banner "Norman Rothwell Heads Lawn Institute". We are pleased to have the activities announced.

#### THANKS FOR LAWN INFORMATION GIVEN

"Thank you for all the Lawn Institute information. An article using some will be in the Lansing State Journal, September 3. Please send your sharpest, best lawn photo - - -". - Sandra Ladendorf, Living Today Editor, Lansing State Journal, Lansing, Michigan.



TECHNICAL SECTION  
WEIBULLS GRAS-TIPS ISSUED

The December 1979 issue of Weibulls Gras-Tips was received in July. As has been customary, brief English summaries are given to the articles written in Swedish. Authors featured in this issue were Bjorklund, Dahlsson, and P. Weibull.

An extensive review of roadside seeding made during the years 1974-78 opens the issue. Cultivars were planted alone and in mixture. Fine fescues at approximately 4.5 pounds to the thousand square feet received the highest ratings, with differences between cultivars and subspecies only slight. Kentucky bluegrass (Poa pratensis) performed reasonably well, and merits inclusion with Festuca. Poa nemoralis and Poa compressa behaved well, but not being "native" are open to question. Colonial bentgrasses, including Highland, provided acceptable results (Highland especially in southern Sweden). Perennial ryegrass was unacceptable because of poor winter hardiness, but Phleum bertolonii can apparently be utilized for rapid establishment. No other species gave acceptable results.

The excellent series of "Descriptions of Grass Diseases", numbers 4 through 11, were continued in this issue. These are beautifully carried out with colored photographs, both general and close-up, and often with drawings or microscopic photographs of spores and mycelia. The discussions are thorough, in both English and Swedish. Disease number 4 is pink snowmold, number 5 gray snowmold, number 6 Typhula, number 7 leafspot (Drechslera or Helminthosporium), number 8 another species of Drechslera, number 9 Mastigosporium leafspot, number 10 crown rust (Puccinia), and number 11 "ice and water damage".

Less comprehensive is the discussion of machines for sowing roadsides, and (with a German rather than English summary) a report on a lawngrass colloquium held in early September of 1979 in Sweden.

GERMAN SOIL ADDITIVE

A telephone call from "Water and Soil Control, Inc.", New Philadelphia, Ohio, alerted us to a polyuronide material imported from Germany, called Alginure. A sample, and technical literature subsequently received in the mail, do not indicate from what substance the material is manufactured, although the name would suggest seaweed. Polyuronides result from the breakdown of organic materials during humification, and the hemicelluloses normally found in cell walls of higher plants are polyuronides. This group of polymers is biologically active in surface membranes, and in cementing soil particles together to provide crumb structure. Apparently responsible scientific attention has been accorded the material in Germany, but translation into English lacks complete lucidity. Soil enrichment of lawns and turfs is one of the suggested uses, involving application of up to 3 ounces of material per square yard; about half this strength is said to "assure speedy and strong rooting" of sod. The material supposedly improves aeration of the soil in a rejuvenation program of sportsfields. Various other horticultural uses are advanced, including use as a transplant root dip and antidesiccant.

PRESS KIT ATTRACTS ATTENTION

A telephone call from the New York Botanical Garden, which regularly receives Institute press kit mailings, asked if we could put their lawn specialist additionally on the mailing list for direct receipt of press kit materials. He has found them so good and useful, that he would like to have personal access. He also indicates interest in a training course at the Institute, were such to be offered.



## TECHNICAL SECTION

### MICHIGAN STATE RESEARCH REPORTS

Dr. John Kaufmann distributed several of his research reports of Michigan State University work, under an August 22 covering letter. Some members will have received these directly, but nevertheless summarization here would seem worthwhile.

The 1979 shade studies were extensive, primarily because of computer usage that made short work of many statistical inputs and evaluations. This becomes rather complicated, resulting in 19 pages. In addition to four primary tables a dozen computer readouts on particular aspects of quality are given. The location of the shade plantings is precisely defined (on average showing a 96% reduction compared to full sunlight). Kaufmann notes that Nugget and Enmundi (among Institute cultivars) were outstanding in the shade research area throughout 1979. Glade and Ram I ranked fairly low in early spring ratings, due largely to leafspot infection, but improved steadily throughout the season to relatively high rankings in autumn.

There was no statistical difference between cultivars on the year old sodded plots, and not a great deal of statistical difference on the seeded plots (Nugget was first in the ratings, slightly ahead of Majestic, Glade and others). Table 3, showing "Quality Rating Average for 1979" for sodded bluegrass ranked Bristol, A-34, Nugget, Cheri, and Enmundi as the top five cultivars in that order. For the seeded plantings Touchdown and Nugget led, (except for a coded selection, WTN-H6).

In the computer readouts, for density, the top five were Adelphi, Bristol, Enmundi, Brunswick and Bonnieblue with Baron, Merion and Victa being quite low because of powdery mildew attack; this was an early spring evaluation, and through summer the order changed somewhat (Nugget led by June 15). By August 30, density ratings indicated A-34, Cheri, Bristol, Nugget and Sydsport to be statistically superior. Some minor reassortment occurred through the rest of the year.

More inclusive is a 45 page report, with 28 tables, entitled "1979 Turfgrass Cultivar Evaluations". These include 4 different species of turfgrass, with evaluations both in East Lansing (southern) and Traverse City (northern).

Bentgrasses received limited evaluation, with Cohansey, Penncross, Emerald, and Pennpar receiving top scoring for uniformity. In a separate planting Penneagle has not been as fully competitive with *Poa annua* as superior cultivars such as Penncross. Since Colonial bentgrasses are treated the same as creeping bentgrasses, it is not surprising that cultivars such as Exeter fared poorly.

Kentucky bluegrass ratings were made at 3 times during the year, under differing weather conditions. Adelphi and Majestic were superior during dry June weather, but Fylking, Baron and Touchdown suffered from *Fusarium*. Majestic received top ranking in December, by which time Glade achieved strong performance but Nugget had turned off-color. In summarization, Kaufmann regards "Adelphi, Majestic and Glade were the top performing varieties." Some of the individual tables may be of interest:

A mid-June evaluation of a planting nearly four years old, for color and density, showed Adelphi, Majestic, Plush, Bonnieblue, Merion, Mosa, Galaxy and Nugget to be statistically ahead in that order. Evaluated for uniformity at the end of August, the order was Adelphi, Glade, Nugget, Majestic, Merion, Plush in the top ten. Judging color in mid-December, Majestic led, followed by Galaxy, Birka, Glade, Orna, Bonnieblue, Cheri, Sydsport and Baron in that order, in the top

- Continued



## MICHIGAN STATE RESEARCH REPORTS - Continued

statistical class. Averaged out for quality ratings Majestic was first, followed by Adelphi, Glade, A-20, Galaxy, Mosa, Bonnieblue, Cheri, Nugget, Plush, Birka, Sydsport, Merion, etc.; common types including Park and Newport were poorest.

A second series of evaluations was also conducted in East Lansing. Kaufmann notes that Victa and Bristol did not compete well after rains came later in the season and dropped in rankings, while Nugget, Glade, and A-34 improved (as in the previously mentioned studies). Vantage and Windsor had very poor winter color. Many of the cultivars entered in this second evaluation are coded selections rather than commercial varieties.

In the North (Traverse City) all bluegrass plantings are becoming invaded with *Poa annua* and quackgrass. Cultivars that suffer from diseases such as leafspot and *Fusarium* generally have greatest invasion by the weed grasses. A-20, several coded selections, and some common types fared best when rated for color and uniformity in mid-April. This is with turf plantings nearly 10 years old, and many modern cultivars are not included. Many comparisons, as for color, are not statistically significant. In the average quality rating it is apparent that a number of the "common" types rate more highly than well-known cultivars such as Merion, Fylking, Baron, Arboretum, and Nugget (which are around the middle of the range). It is well to remember that the Traverse City plantings are on poor, sandy soil, as well as a cold environment with a short season.

Kaufmann indicates that the fine fescue cultivar evaluations are not very meaningful, and often statistical difference are slight or non-existent. In overall average, Dawson led, followed by a coded selection, Jade, Koket, Ensylva, Famosa, Banner, Menuet, and other familiar names. These ratings were at Traverse City.

Testing of perennial ryegrasses at Traverse City has been interesting. There has been no winter loss due to freezing. Snowmold has been heavy on some cultivars (Yorktown and Caravelle), and red thread a serious disease (Loretta was rated near the bottom almost entirely because of red thread, even though the cultivar proved a good performer where red thread was not prevalent). The ratings tables indicated, for approximately three year old turf:

Yorktown II, Caprice, Derby, Diplomat, Pennfine and NK-200 among the best for color in mid-April. Caravelle very poor. For color and density in mid-June Idole, Ensportia, Barry, Loretta, Manhattan, Yorktown II, Derby, Paramount and Yorktown in the highest statistical group. In overall average ratings for 1979, Omega is first, followed by Caprice, Sprinter, Derby, Citation, Lamora, Pennfine, etc.; Loretta, Caravelle, and Eaton are at the bottom of the ratings.

### THATCH RELATED TO VARIETY

Shearman et al, Nebraska, report in the June HortScience on "Thatch Accumulation in Kentucky Bluegrass as Influenced by Cultivar, Mowing, and Nitrogen". Fertilization level made no difference in the accumulation of thatch, but mowing height did (the two inch mowing height developed twice as much thatch as the one inch mowing height). S-21, A-34, and common type bluegrasses produced significantly less thatch than did some of the elite strains (Glade, Cheri, Victa, Nugget). Many cultivars on the Lawn Institute's Variety Review Board were intermediate (e.g. Vantage, Baron, Birka, Majestic, Fylking, Adelphi).



## OHIO TURFGRASS RESEARCH FIELD DAY

On August 5, Ohio State University conducted its annual "Turfgrass Research Field Day" on the research grounds in Columbus. This is chiefly a tour of "stops", at which research personnel explain the activities. Test plots are well labelled, and it is possible to visit the demonstrations for leisurely appraisal. Several hundred persons attended, with lawn service firms seeming to be especially well represented.

Stop one involved Penncross bentgrass (managed like a golf green), over lysimeter-type collection facilities. The "greens" have a high pH (8.0). Apparently the original fertilization of phosphorus was adequate, for there has been no response from additional P. Light treatments with both nitrogen and potassium improved growth somewhat, but high rates depressed growth. Heavier nitrogen rates increased leafiness rather gradually, but decreased root production. Some color response has been obtained from soluble iron. Lighter rates of nitrogen more frequently seem slightly better than heavier rates less frequently. All fertilizations improved the turf compared to no fertilization, but visual differences between plots from differing fertilizers was not apparent. Straight urea has provided as high or higher ratings than most branded fertilizers according to the data sheet.

Stop two involved turfgrass plantings in the shade (said to reach about 95%). Except that 'Sabre' Poa trivialis was markedly better, used alone or in combination with other grasses (such as perennial ryegrass), there was not a great deal of difference between cultivars or species. This is fairly damp shade, and fine fescues seemed not so good as the bluegrasses and perennial ryegrasses. However these test plantings are only a few months old and not necessarily indicative of long term performance. An earlier evaluation mentioned in the data sheet showed Nugget, A-34, Glade, Birka and Bristol bluegrasses to consistently show greatest shade adaptability. According to OSU rankings best average quality after Sabre and Sabre mixtures were: Manhattan ryegrass, Pennfine ryegrass, Banner fescue, and Loretta ryegrass.

Stop three involved fungicide tests, with dollarspot the chief disease being treated for. However, dollarspot was not serious on the bentgrass plots at this time, although it had invaded one bluegrass planting (Nugget) rather severely. Larsen emphasized that dollarspot resistance has developed where benlate (and sister chemicals) has been utilized, but that there is hope that Bayleton (and other newer products) will not be so affected. He recommends alternation, or combination, of a contact and a systemic fungicide. He concedes that there is a lot of truth in the ecological problem of "side-effects" where fungicides are regularly used, as was discussed in the July Golf Superintendent magazine. Historically dollarspot has not been severe on the test plots until late August or September.

Stop four involved an April seeding of perennial ryegrasses, the only labelled turfgrass cultivar ratings on display. With only a few months growth, ratings are not too meaningful, although it was obvious that some (such as 'Northwest', a mix including about 85% annual ryegrass) were not at all satisfactory. Citation (exceptionally dark), Birdie, Blazer, Diplomat, all looked very good on Field Day.

Stop five involved both slow and rapid-release nitrogen sources applied to bluegrass turf. Again there was not a great deal of difference between products so far as visible influence could be told, but plots that were fertilized were better than the unfertilized check. Clipping yield data showed oxamide to give the most clippings, ureaformaldehyde (UF) the least.

Stop six, comparing pre-emergence crabgrass preventers, provided one of the most dramatic displays. Oxadiazon seemed to give the best crabgrass prevention, but



## OHIO TURFGRASS RESEARCH FIELD DAY - Continued

was said to have discolored turf in April, the time of application (the turf was completely recovered at Field Day). Bensulide was about equally good, with the heavier rates of DCPA not far behind. Siduron was satisfactory, but Lasso and several Swift formulations little better than the check. Good prevention was not interfered with by coring or spiking, but in some cases vertical mowing appreciably lessened crabgrass control.

Stops seven and eight involved a visit to the Rhizotron, in which rootgrowth is observed on glass plates below ground. It has been noted that either Penncross bentgrass or Poa annua makes adequate root growth under normal conditions, but that root growth ceases with Poa annua during seedhead formation. It was mentioned that although air temperature may seem reasonable (in the 80's F.), crown temperatures above 100°F. have been noted.

Stop nine involved discussions of insect problems with entomologist Niemczyk. Niemczyk also conducted an insect workshop in the afternoon. He noted that insect damage often escapes notice earlier in the season because the pests are so small, but that symptoms of damage show up by August (especially bluegrass billbug and chinchbug). Niemczyk recommends early insecticide application even as early as April to kill peregrinating females before they can lay eggs widely. Niemczyk emphasizes that greenbug, newly important on turf, has been around a long time on grains. Apparently the species has built resistance against familiar insecticides, but seem susceptible to Orthene and Pirimor (special labelling for their use has been obtained for Ohio).

## FURTHER DAMNIFICATION OF FUNGICIDES

An article by Brede, Pennsylvania, in the July Golf Course Management, further questions the generally held positive attitude about fungicides. Brede emphasizes how often side effects prove a problem, and greater incidence of disease results from fungicide use than with no spraying. His article is complimentary to Smiley's ecological approach, involving the interactions among microorganisms about which we know very little.

Some of the cases Brede cites may be useful in pointing out how much more effective it generally is to breed cultivars resistant to disease, rather than to rely upon control of the disease with fungicides. A case is cited in Australia where benomyl predisposed turf to fungal growth, and of course a number of years ago Rhode Island research documented how benomyl made Merion susceptible to leafspot (to which it would otherwise be resistant).

Apparently fungicide applications have inhibited thatch-consuming fungi at Penn State. In Arkansas fungicide treatments eliminated earthworms. At Cornell, benomyl treatment caused a marked increase of acidity in the rootzone. A fungicide application at Penn State delayed bluegrass green-up in spring for two weeks. Other similar cases are cited, and it is noted that fungicide treatments generally have predisposed turf to Pythium disease (markedly so in a laboratory study at Penn State).

The article has appeal, in urging a segment of the turfgrass industry brought up on regular fungicide applications, to think in broader terms, considering ecological influences on microbial populations when fungicides are used.



As is customary, Park Maintenance magazine devotes its July issue chiefly to an annual summary of turf research nationwide. This year the Midwest is handled by Vargas of Michigan, the Northeast by Hurto of Massachusetts, and the South by Dickens of Alabama. Some of the summaries are marred by poor proofing and editorial handling.

The general impression is that not a great deal of novel research was undertaken during the year, but rather refinements on projects already receiving some attention. Much of this research has already been reviewed in Harvests, as reports on it appeared in the technical journals.

For the Midwest a good deal of attention has been given work at Illinois (when Turgeon and Hurto were still there), dealing with thatch conditions and lawnseed mixtures. It may be remembered that thatch often affects the longevity of pre-emergence herbicides, but that paraquat seems less inactivated by thatch than by soil. The Illinois results showed Citation ryegrass and Fylking bluegrass to be less aggressive than Pennfine ryegrass and Touchdown bluegrass, for example, a line of reasoning important to devising mixtures (depending upon whether the ryegrass is meant to disappear or be a permanent component of the turf). Also, at Illinois, Street found urea loss to be significant in a thatchy turf compared to slow-release nitrogen from such as IBDU.

Ohio research reported dealt chiefly with insect and disease control. Niemczyk discovered a new grub similar to Ataenius, and highlights the increasing importance of the aphid-like green bug (special permission has been obtained in Ohio to use Orthene for green bug control on an "emergency" basis). At Michigan avoidance of spring nitrogen fertilization reduced severity of Fusarium blight, as did light nitrogen applications during summer. Promising fine fescue cultivars have been isolated at Michigan, and seem to yield seed adequately in northwestern growing tests. Releases can be anticipated shortly.

Research reported for the Northeast mostly reviews activities rather well known. Studies in Connecticut and Maine verify the value of returning clippings to the lawn. Use of DCPA wettable powder for control of Veronica filiformis is reaffirmed in Pennsylvania research. A new group of growth regulators, active through roots rather than foliage pick-up, is under study.

In the South research activity seems to have picked up. Winterseeding mixtures are being evaluated, and in Florida st. augustinegrass is being screened (new cultivars induced by radiation), as is centipedegrass in Georgia and Alabama. Promising new releases are imminent. Mutants out of the Tifton bermudagrasses are being evaluated for cold tolerance.

Much research centers on weed control, because of the climate an unusually persistent problem in the South. Glyphosate has controlled wild garlic in dormant bermudagrass, but is risky when the bermuda begins budding. Combinations of metribuzin (state labels are being obtained) with MSMA have given outstanding results in control of goosegrass. In Kentucky it was found that low mowing plus spring "cultivation" helps restrain nimblewill in Kentucky bluegrass. Ethofumesate (Nortron) is reported to selectively control annual bluegrass in overseeded perennial ryegrass. In Georgia fungi are being evaluated for biological control of annual bluegrass. It is noted that most herbicides can have deleterious effects on the turfgrasses as well as controlling weeds (some of the crabgrass preventers, for example, have reduced the cold tolerance of bermudagrass, and restricted rooting). Combinations of Embark and EL-500 look promising for growth retardation of common bermudagrass.



Comparatively little attention is given disease and insect control. For northern grasses, autumn fertilization is still recommended as "best". Interestingly, the "root die-back" reported out of Beard's laboratory in Texas did not prevail at the rhizotron at Auburn, Alabama this year, and reportedly did not occur in Texas either. Thus the general applicability of the principle advanced by Beard's group seems questionable; there may be no spring die-back except under peculiar, local circumstances. Incidentally, in Alabama, little or no rooting of sod occurs until soil temperature rose above 10° C., and then bermudagrass rooted much more rapidly than did zoysia.

#### MIDYEAR RASEN

Vol. 11, No. 2, June 1980, Rasen (Turf/Gazon), Dr. Boeker's International Turfgrass Journal from Bonn, Germany, was received in August. All articles are summarized in German, English and French.

An opening item by Hemmersbach, Bonn, has to do with fertilization of mixed turf. As would be anticipated, fertilization was helpful in improving color and density of the stand. It seems also to have increased thatching, and had some influence on long term grass population changes. An October fertilization was felt not to be sufficient for carrying the turf until the following June in top condition without additional fertilization.

Snyder and Burt, Florida, discuss subsurface turf irrigation. It was found that subsurface irrigation lines spaced 46 cm. (10 cm. deep) did not save on the amount of water used compared to traditional overhead systems. Furthermore, the underground system often resulted in bands of wilted and "starved" turf between irrigation lines.

Minderhoud, Wageningen, noted that many perennial ryegrass cultivars have decumbent tillers which may root at nodes, in effect spreading somewhat. He suggests significance to such "creeping" tendencies, as perhaps of practical importance.

Heidler, Braunschweig, discusses eradication of weeds in turf. He talks of cultural control through mowing, fertilization, watering, etc. and then lists herbicides available for lawns. The weeds listed in the tables are in great measure the same international weeds we have in lawns in this country, but it appears as though some of the herbicides behave somewhat differently in Europe (for example Plantago are listed as being well controlled by dicamba).

Kuttruff, Kleve-Kellen, describes a mechanical device made to simulate wear imposed on turf by soccer playing. Two attractive colored inserts, one advocating 'Majestic' perennial ryegrass combined w/Kimono' Kentucky bluegrass in mixtures for sports-plantings, and an advertisement for 'Barfalla' fine fescue (with excellent photographs by Barenbrug) are included.

#### GRASS ROOT GROWTH RELATED TO TEMPERATURE

Masuias et al, Purdue, reported to the annual meeting of the American Society of Horticultural Science on tests comparing root growth of perennial ryegrass, meadow fescue and several prairie plants. Root growth of cool season grasses increased as temperature rose from 12° to 25° C., but decreased above this (root growth of all species ceased at 48.5° C., = about 120° F.). Root growth of prairie plants, however, continued to grow up to a temperature of 30.5° C. before beginning to decline.



## REVIEW OF LAWNSEED FIELD BURNING

John Hardison provides an excellent review, replete with colored photographs, of the "Role of Fire for Disease Control in Grass Seed Production", in the July Plant Disease journal. An opening graph notes the marked reduction of infestation by several diseases and other pests when field burning of seed fields began after 1949. Field burning has been very effective in controlling blind seed disease, ergot, silvertop, nematodes, and various leaf afflictions. Hardison discusses each in detail.

Hardison is pessimistic about finding any other means of disease control even approximating the effectiveness of field burning, although a combination of fungicide with field burning may prove useful. He notes the political difficulties that have arisen because of air contamination by the burning. But he finds it necessary to continue field burning, which " - - - kills 95-99% of the weed seed at the soil surface and provides a clean soil surface allowing action of fall-applied soil-active herbicides that perform poorly in unburned fields - - -". He adds, "no substitute for the inexpensive, ancient and time-honored practice of field burning is either available or apparent - - - thermo-sanitation needed for efficient grass seed production, field burning is the cheapest, most effective and least damaging to the environment."

## CONFUSING SEED GERMINATION

Lawnseed germination is often considered a response to fixed conditions, even though a certain amount of "after-ripening" may be necessary, as in the case of Kentucky bluegrass. Research reported by Baskin and Baskin in the June Ecology discusses a highly variable case of sprouting. Tests were with Ambrosia artemisiifolia, a species of ragweed, for which buried seeds germinated well in light but not in darkness in early spring, then reversed this response by germinating well in darkness at summer temperatures. In late spring seeds enter a period of dormancy and do not germinate at any temperature, in light or darkness. Seeds kept for months at a certain temperature required light for germination, while under cooler conditions light was not required. But then these same seeds lost the ability to germinate in light at higher temperature. Seeds kept at temperatures that were low for encouraging germination lost ability to germinate in the darkness, and at higher temperatures they lost the ability to germinate in light! Apparently there is a complex interplay of germination responses, related to temperature, light, and no doubt other factors!

## PHENOXY HERBICIDES RELATED TO LEAFSPOT DISEASE

Hodges, Iowa State, reports in the September Weeds, Trees and Turf on studies at his laboratory linking the phenoxy (hormonal) type herbicides with the incidence of leafspot disease (Helminthosporium sorokinianum) on Kentucky bluegrass. An interplay is evident with some materials at certain rates, usually causing an increase in leafspot on older foliage. Hodges speculates that the herbicides "accentuate" aging. He concludes that in late spring and early summer herbicides may be a factor in increasing leafspot severity.

## PHOTOSYNTHESIS RELATES TO DEMAND

A report by Peet and Clough, North Carolina, to the Ecological Society of America in August, indicated that photosynthetic rates are proportional to the demand for assimilates. Soybeans were used as the test organism, but the principal would apply to lawngrasses and weeds as well. Plants with equal leaf numbers were more efficient photosynthetically when confronted with a sizable "sink" (heavy pod production).



### TURFGRASS RESISTANCE TO COLD

Gusta, Saskatchewan, and Butler et al, Colorado, report on "Freezing Resistance of Perennial Turfgrasses" in the August issue of HortScience. Creeping bentgrasses were the most resistant to cold of any of the genera tested, perennial ryegrasses the least resistant. Kentucky bluegrasses under certain conditions were almost as cold-hardy as creeping bentgrass, but became more susceptible to freezing once winter dormancy was broken by warm weather (greenhouse environment). Also, bluegrass was more resistant to cold when subjected to drought than when fully hydrated. According to Table I, elite ryegrasses were hardier than common types, Diplomat and Manhattan enduring the lowest temperatures (lower than NK-200 and Norlea, both recognized for winter hardiness). On the other hand common types of bluegrass and Fylking were listed as being hardier than the elite cultivars tested, including Nugget. On the whole neither the red fescues nor the alkali grasses were quite so winter-hardy as Kentucky bluegrass.

### RESISTANCE TO FUNGICIDES INCREASES

Charles Delp reports in the July Plant Disease on "Coping with Resistance to Plant Disease Control Agents". No longer is it a rarity to find diseases developing resistance to chemical agents, analogous to what has been commonplace with insects and insecticides. Only a decade ago there were but a handful of cases (genera represented), but incidence has mushroomed through the 1970's almost tenfold. Most classes of chemical agents are involved, but especially the benzimidazoles and antibiotics. This great increase is attributed to development of highly potent specific location inhibitors (effecting one or few metabolic sites) as compared to the older multisite fungicides "such as phthalimides, dithiocarbamates and elemental compounds such as sulfur, which have shown few resistance problems". It is difficult for an organism to develop coordinated protective mutations for a large series of gene sites, but relatively easy to select for a single (or few) metabolic factor.

### SMOG INJURY TO TURFGRASSES

The August issue of Golf Course Management reviews California investigations (under Youngner and Mudge) concerning reaction of a number of fine turf cultivars to treatments with ozone and PAN. All ryegrasses suffered rather badly from ozone, as did bentgrasses (except Highland), and "common" Chewings fescue. Bluegrasses vary greatly, with A-34, Campus, Prato, Merion and Adelphi rather badly hit (but not so badly as ryegrasses), but others rather little affected (especially Newport, Fylking, common types and Nugget).

PAN damage was not quite so severe on the whole, although several ryegrasses were badly affected. Again, Highland was the most tolerant of the bentgrasses, and bluegrasses as a group were not badly afflicted (least damaged were Nugget, Park, Cougar, Fylking, Newport, and Prato).

### WINTER WEED CONTROL IN DORMANT BERMUDAGRASS

Johnson, in the July Weed Science, discusses the complicated matter of controlling various winter weeds volunteering in dormant bermudagrass in the Southeast. Herbicide applications are generally made post-emergence after the bermuda is thoroughly dormant (Jan.-March). If the bermudagrass is only semi-dormant it can be appreciably injured by familiar chemicals such as glyphosate and phenoxy combinations. Paraquat and glyphosate have given excellent control of annual bluegrass, but atrazine has not (although the atrazine has not been injurious to the bermudagrass). The article should be reviewed for discussion of appropriate timing, herbicides, and rates, related to various species of weeds.



## GOOSEGRASS CONTROL IN BERMUDAGRASS

Johnson, Georgia, reports in the July issue of Weed Science on research seeking a safe means for controlling goosegrass in bermudagrass golf greens. MSMA has not been very effective against goosegrass unless used at rates high enough to be injurious to bermudagrass. Methazole and metribuzin have both proven effective against goosegrass, but generally injurious to the bermudagrass. Johnson finds that relatively lighter rates of MSMA with either metribuzin or methazole in combination seems to be at least 96% effective in controlling goosegrass with only temporary discoloration to the bermudagrass. He would recommend two applications, utilizing MSMA at about 2.24 kg/ha combined with either of the other chemicals at 0.14 kg/ha (only 10-30% of the rate normally necessary when used alone).

## PURDUE BLUEGRASS RATINGS

The July issue of Grounds Maintenance magazine carried the rating of bluegrass cultivars ranked by Purdue researchers 1975-79. The accumulative listing as reported, ranks the cultivars in this order:

- |              |                |              |
|--------------|----------------|--------------|
| 1. Brunswick | 11. Sydsport   | 21. Granada  |
| 2. Plush     | 12. Vantage    | 22. Enoble   |
| 3. Touchdown | 13. Parade     | 23. Majestic |
| 4. Merit     | 14. Kenblue    | 24. Entopper |
| 5. Melissa   | 15. Glade      | 25. Windsor  |
| 6. Monopoly  | 16. Baron      | 26. Delft    |
| 7. Adelphi   | 17. Park       | 27. Geronimo |
| 8. Victa     | 18. Bonnieblue | 28. Nugget   |
| 9. Rugby     | 19. Fylking    | 29. Campina  |
| 10. Cheri    | 20. Merion     | 30. Pennstar |

## LAWN WEED STRONGLY ECOTYPIC

A study by Teramura, Maryland, reported to the annual meeting of the Ecological Society of America in August, dealt with contrasting populations of an ubiquitous lawn weed, narrow-leaf plantain (Plantago lanceolata). Populations from a sunny location, a partially shaded location, and a shaded location in North Carolina were given phytotron analysis, revealing substantial physiologic and morphologic differences. Some genetic isolating mechanism may be involved, for it seems surprising that this degree of difference would evolve in so short of time, among nearby populations noted for spreading widely and having a potential for gene exchange. This is another example of the marked adaptiveness of panboreal lawn weeds.

## HERBICIDES AND OVERSEEDING RYEGRASS

Johnson, Georgia, reports in the July-August Agronomy Journal on the residual activity of certain herbicide treatments on bermudagrass golf greens being overseeded with winter ryegrass. The good news is that none of the herbicides used to control goosegrass (Eleusine indica) were harmful to the ryegrass, and in most cases even to the day before overseeding. Methazole was the lone exception, and should be applied at least a week before overseeding is contemplated. Other herbicides in the test were MSMA, metribuzin, and combinations of the three materials. The golf green turf being overseeded was 'Tifway' bermudagrass.

## BILLBUG RESISTANCE AMONG BLUEGRASS CULTIVARS

Lindgren et al, Nebraska, reported to the 77th annual meeting of the American Society for Horticultural Science in late July, on differential billbug attack among bluegrass cultivars. Common bluegrasses were little affected, but Sydsport heavily damaged. Thatch accumulation did not seem to have a determining influence on billbug density.



## MORE ON SPRING ROOT DIE BACK OF SOUTHERN TURFGRASSES

DiPaola (now of North Carolina) and Beard (Texas) discuss "Spring Root Die-Back of Warm-Season Turfgrasses" in the July-August Green Section Record. Texas work showed both st. augustine and bermudagrass to experience marked die-back of old roots in the spring season just as the grasses begin budding new foliage. Apparently considerable strain is imposed upon the grass at this time, and any undue stress can have more than ordinary consequences. Use (wear), mowing, and other stress-causing factors should be more carefully watched over during spring die-back. Consider, also, the consequence of pre-emergence weed control, scarification (aerification), transitional measures for removing wintergrass, use of growth retardants, manner of fertilization, thinning or vertical mowing, and suchlike.

## ABOUT LAWN CLIPPINGS

Bob O'Knefski, Turfgrass Specialist for Nassau County, discusses in the July Nassau Living "Recycling Lawn Clippings". He cites research at Michigan State and the University of Connecticut showing that removal of clippings from the lawn sacrifices nearly two pounds of nitrogen to the 1,000 square feet annually. Surprisingly, in a survey done on Long Island, 90% of the homeowners collected the clippings, an unusually high percentage. O'Knefski recommends leaving the clippings on the lawn, both to save energy (nutrients), and because experience has shown on Long Island that grass is generally better where clippings are left. Nitrogen returned to the soil through decomposition of clippings is not apt to be a pollutant of the water table, as so often is soluble fertilizer applied to a lawn. Nitrate pollution of drinking water has been a problem on Long Island.

## GOOD COLOR IN KENTUCKY BLUEGRASS

Hariivandi and Butler, Colorado, report on "Iron Chlorosis of Kentucky Bluegrass Cultivars" in the August HortScience. Total iron in the grass plant was highly correlated with chlorophyll, and this with dark green color. Top-rating for dark green color were Adelphi, Sodco, Sydsport, and Windsor, followed closely by Fylking, Newport and Prato; poorest in color (most chlorotic) were Warren's A-34, Nugget, Arboretum, Park, and Warren's A-20.

## LITERATURE FROM FLORIDA

We were pleased to receive an extensive set of reprints from Dr. E. O. Burt, Florida, towards the end of September. Some of the papers have already been reviewed in past Harvests, after having appeared in professional journals. What with attention focusing more and more on the Sunbelt, a quick review may be of interest to members.

Busey and Burt take an environmental approach in discussing "Turf, Energy and the Environment" in the Proceedings of the Florida State Horticultural Society, Vol. 92, 1979. Using various data, they calculate that turfgrass maintenance utilizes approximately 1.5% of total fuel expenditures in Florida, and 28% of the energy used in agriculture generally. This is a sizable investment, and warrants looking for means to conserve energy in turfgrass maintenance and landscaping. The authors conclude that hybrid bermudagrass is about twice as costly as either zoysia or st. augustine, nearly 5 times as expensive to maintain as bahiagrass and centipede. Bermuda requires by far the most mowing, followed by st. augustine, zoysia, centipede and bahia in that order. Fertilization and irrigation requirements follow much the same sequence.

The authors try to define turfgrass goals, in order to see where economies can be made. In particular they relate these to breeding programs that might yield new cultivars

- Continued



## LITERATURE FROM FLORIDA - Continued

requiring less maintenance (with bahiagrass, for example, fewer seedheads to permit less frequent mowing, faster coverage to better prevent weeds, and shorter stature for improved utility). They also touch upon economical practices, such as fertilization and utilization of clippings. Their estimate is that Florida spends in excess of six hundred million dollars annually for turf maintenance, and that considerable savings are possible.

Burt reviews Southeastern weed control in a couple of papers. Asulam is being recommended for weed control in st. augustine, often half-and-half with atrazine. Metribuzin gives good selective control of goosegrass and several other weeds in bermudagrass, and can be used alone or in combination with arsonates. An experimental Dupont herbicide seems highly selective and effective for controlling sedges.

Of course 2,4-D and related phenoxies are still basic for weed control in bermuda, bahia, centipede and zoysia grasses. The arsonates can be used for annual invaders of bermuda and zoysia. There is no good answer for eliminating grassy weeds in bahia and centipede.

Snyder and Burt have tested three commercial soil inoculants meant to improve turf-grass growth. Apparently these are composed chiefly of nitrogen-fixing organisms, such as certain bacteria, mycorrhizae and blue-green algae. No usefulness was found with any of the products, at any rates tested. The authors protest that inoculant manufacturers do not appear as responsible as they might be, making extravagant claims, employing personnel not expert in the field, and not informing purchasers accurately about content of products.

## GRASS PERFORMANCE, INSTITUTE GROUNDS

Demonstration plantings of Variety Review Board cultivars unreplanted, unirrigated, mowed at 1 1/2 inches with a rotary mower, and fertilized rather sparingly (very lightly once or twice spring-summer, fairly heavily autumn). Well-spaced rains kept vegetation green and growing through July. Then, for the first half of August rain came almost daily, saturating the ground. This, combined with higher than average temperatures, was deleterious to gardens, turf that was not well drained. From late August through September little rain fell. Towards the end of September grub damage showed fairly clearly on grass of which the deeper roots had been severed, causing drying out and browning.

This was not the kind of summer conducive to good performance from fine fescues; most cultivars looked bedraggled, but will recoup during winter. On the other hand the newer tall fescues, such as Rebel and Falcon, seemingly "enjoyed" the summer, remaining green and free from disease. Most bluegrasses performed satisfactorily, but for the first time Fusarium (apparently) attacked in certain locations. Perennial ryegrasses, after two years of outperforming bluegrass during the hot summer weather, were not as good as the Kentucky bluegrasses in this particular weather cycle (however they were acceptable, merely turning somewhat thin and ragged compared to the normal appearance). Thus it was a summer to confirm the wisdom of including bluegrass in plantings, using blends of cultivars, and considering the possibilities of the fine-textured tall fescues for utility plantings.