

BETTER LAWN - - HARVESTS

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NEW BOARD, OFFICERS, ELECTED AT ATLANTA

The Lawn Institute's annual meeting was held in Atlanta on June 30, the summary for which follows as a separate item. President Rothwell was gratified by a full and enthusiastic attendance, which executed the necessary business with dispatch.

Re-elected as officers for the coming year were:

Norman Rothwell, N. M. Rothwell Seeds, President
Robert Peterson, E. F. Burlingham & Sons, Vice President
Robert Russell, J. & L. Adikes, Inc., Secretary-Treasurer

Elected to the Board of Trustees for the coming year were:

Gil Barber, Southern States
Robert Buker, F. F. R.
James Carnes, International Seeds, Inc.
Gabe Eros, OSECO, Inc.
Jay Glatt, Turf Seeds, Inc.
William Hill, George W. Hill Co.
Doyle Jacklin, Jacklin Seed Division, Vaughan-Jacklin Corp.
Drew Kinder, Whitney-Dickinson Seed Co.
Ben Klugman, Twin City Seed Co.
Peter Loft, Loft's Pedigreed Seed Co.
Edward Mangelsdorf, Mangelsdorf Seed Co.
Clifford Mattila, Merion Bluegrass Association
Scott Patterson, Peterson Seed Co.
Robert Peterson, E. F. Burlingham & Sons
Norman Rothwell, Rothwell Seeds, Inc.
Robert Russell, J. & L. Adikes
Howard Schuler, Northrup-King & Co.
John Sutherland, Stanford Seed Co.
Douglas Fisher, Highland Bentgrass Commission
Robert Wetzels, Wetzels Seed Co.
Kent Wiley, Pickseed West, Inc.
John Zajac, Garfield/Williamson

LAWN INSTITUTE ANNUAL MEETING, MARRIOTT HOTEL, ATLANTA, GA., JUNE 30, 1981

The meeting was called to order by President Rothwell at 1:10 P.M. Secretary Russell, in the interest of saving time, asked for approval of the minutes as they appeared in Volume 27, No. 2, July 1980, Harvests. Motion approved. The full financial report, duly audited, had been circulated, and Treasurer Russell at this time made available epitomized copies for examination. He reported a successful fiscal year, with an increase of assets over the previous year to a closing balance of \$76,968.30. The financial report was approved unanimously.

President Rothwell next called upon Director Schery for his annual report of the year's activities. This is reproduced in full separately in this issue of Harvests (page 5). Dr. Pepin was asked to discuss activities of the Variety Review Board. This, too, is reproduced in full as a separate item (page 4). Commercial production of 'Arboretum' Kentucky bluegrass was reported to have ceased, in which event this variety would be withdrawn from the listings. However, Mr. Norb Stroot, Mangelsdorf Seed, assured the group that Arboretum was still in production, whereupon Chairman Pepin asked that the preliminary decision concerning Arboretum be withdrawn for reconsideration.

Mr. Hal Dickey, who had chaired the Product Review Board during the year, could not be present for the meeting; Mr. Rothwell summarized committee activities as diligent, with several good leads uncovered but no positive developments outside of the lawnseed field yet reaching fruition. Robert Peterson, chairing the Research Grant Committee, reviewed several proposals which have been advanced, including sponsorship of research on ergot disease (now bothering many varieties of bluegrass in the West), and possibility of amplifying the national trials with Jack Murray at Beltsville. A \$300 grant had been provided FIS, in support of the book "Feeding the 5,000 million", with approval of the Executive Committee.

President Rothwell noted that the Institute had provided the FIS with literature for the Vienna conference. Among the year's activities was re-examination of the Institute's logo, with the thought in mind that possibly a simpler, more easily-reproduced design could be useful for packaging? However, after examination of alternatives, nothing outstanding was uncovered, nor any one design agreed upon by all members of the Executive Committee, so it was decided to continue with the present designs. A separate "Seal of Approval" logo is available for packages, less intricate than the letterhead logo used on stationary.

President Rothwell called upon the Nominating Committee under chairmanship of James Carnes for its report. All nominees proposed were elected, (details are given separately, page 1).

Regional production and marketing developments were reviewed by several representatives. Don Jacklin noted that in the main producing areas of eastern Washington record rainfall has occurred, with good vegetative growth but some "down" grass. Yields should be good but short of excellent, depending upon how well harvesting can proceed. For the East, Peter Loft pointed out that spring business has been very good on the consumer front, but that professional business has been less than robust, partly a reflection of the continuing housing slump. Others mentioned a serious depression of the sod industry in the upper Midwest. An over-abundance of rain on weekends has also held down consumer business.

President Rothwell offered his summarization for the fiscal year (given in full as a separate item, page 3). The general meeting was thereupon concluded, and the new Board convened.

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LAWN INSTITUTE ANNUAL MEETING - Continued

The Board re-elected incumbent officers for another term, - e. g. Norman Rothwell, President; Robert Peterson, Vice President; Robert Russell, Secretary-Treasurer. Mr. Rothwell thanked the Board, and proceeded with committee appointments. Bill Hill was asked to chair the Membership Solicitation Committee, John Glatelly the Research Grant Committee, and Rich Hurley the Product Review Board. The Executive Committee (Jim Carnes, Doyle Jacklin and Howard Schuler plus the officers), and the Variety Review Board (Gerald Pepin, Dick Bailey, Howard Kaerwer and Peter Loft) will remain unchanged. An additional Search Committee, to arrange for an orderly continuity of the directorship when Dr. Schery retires, is to be chaired by Howard Schuler, with Robert Peterson and Doyle Jacklin as members.

The Variety Review Board report as presented to the general meeting by Dr. Pepin was voted approval by the new Board of Trustees. The proposed Marysville office budget was approved, subject to uncertainties that depend upon income and unforeseen developments. The Board expressed interest in continuing with the Lawn and Garden "Supplement" (Lawns, Gardens, and Pools) as produced by Pflaum, depending upon an acceptable working arrangement. Some discussion centered on whether any way might be found for amplifying autumn usage of lawnseed; Dr. Schery mentioned availability of radio publicity which could still be arranged for this autumn if funding were available.

The next annual meeting for the Institute was set for Dallas, Texas, in conjunction with that of the ASTA. No further business being brought before the Board, President Rothwell adjourned the meeting, thanking all for their interest and attendance.

PRESIDENTIAL SUMMARY FOR YEAR ENDING July 1981

It has been a privilege and pleasure to serve as President of the Lawn Institute during the past year.

It has been very satisfying to work with our Director, Dr. R. W. Schery, a most cooperative, helpful and prolific writer and worker. I have appreciated the fine contributions made by the directors and trustees and the various committee contributions made in the interest of furthering the effective work of the Institute.

It is my sincere belief that we in the Institute should continue to review and revise our goals and objectives in keeping with modern trends and developments. I also believe that we should encourage allied companies participation in our Institute. This will help to enlarge the scope and impact that the Institute will have in all our areas of influence.

During the coming months I hope that we can be more specific and effective in our contributions to those interested in our improved ecology and environment.

Finally during the week of July 20, the International Turfgrass Society is meeting at the University of Guelph, Ontario, Canada. Interested members are encouraged to attend.

Respectfully Submitted,

Norman Rothwell
President

ANNUAL REPORT OF THE LAWN INSTITUTE VARIETY REVIEW BOARD, ATLANTA, GEORGIA, JUNE 30, '81

For the July 1980/June 1981 period three applications were received by the Variety Review Board for acceptance to the Lawn Institute list of approved varieties

Applications were approved for Falcon turf-type tall fescue (E. F. Burlingham & Son) and Eclipse Kentucky bluegrass (Jacklin Seed Co.).

An application for Norlea perennial ryegrass was considered. However, it was rejected because although Norlea is very winterhardy, it is inferior in turf quality to other turf-type perennial ryegrasses already on the approved list.

Arboretum Kentucky bluegrass was questioned because of reports that commercial seed production had been terminated. However, Mr. Stroot of Mangelsdorf Seed indicated that this was not the case, and the initial decision was called for reconsideration.

The Variety Review Board recommends that the Lawn Institute Executive Committee add Falcon and Eclipse to the approved list.

The current list of approved varieties now includes the following varieties:

<u>PERENNIAL RYEGRASS</u>	<u>FINE FESCUE</u>	<u>SPECIALTY VARIETIES</u>	<u>KENTUCKY BLUEGRASS</u>
Blazer	Banner	Emerald creeping bent	Adelphi
Citation	Ensylva	Highland colonial bent	America
Derby	Highlight	Prominent creeping bent	Arboretum
Diplomat	Koket	<u>Sabre Poa trivialis</u>	Baron
Fiesta	Ruby	Rebel tall fescue	Birka
Manhattan		Falcon tall fescue	Bonnieblue
NK-200			Eclipse
Omega			Enmundi
Pennfine			Fylking
Regal			Glade
Yorktown II			Majestic
			Merion
			Merit
			Nugget
			Plush
			Ram I
			Sydsport
			Touchdown
			Vantage

Respectfully submitted,

G. W. Pepin
Chairman, Variety Review Board

ANNUAL REPORT BY THE DIRECTOR, TO THE BOARD OF TRUSTEES, ATLANTA, FOR THE FISCAL YEAR 1980-81.

Those of you who find time to peruse Harvest know full well what your Institute has been "up to", and it's an imposition on your patience to give much detail once again here. However, this is the only time we gather under one roof; you are entitled to a summarization of what has gone on since last year, and an opportunity to direct questions to me.

By way of backdrop, general interest in lawns, lawnseed and lawn products seems not to have lessened, but the national mood is experiencing redirection. Partly this is a response to a more conservative political mein, partly realization that harsher times are here (particularly in the new housing market), and partly a subliminal awareness that various crises are a way of life and can no longer be glossed over. Readers have become more serious about grounds maintenance. Frills give way to essentials, and economical workaday measures are invoked. Willingness exists to pay for quality, but nose-to-the-grindstone quality is demanded, not frivolity merely for show.

In a milieu such as this the Institute has recast its activities somewhat. It has taken stronger measures to emphasize advantages lawns have to offer, and new lawn cultivars over unselected grasses. Major vehicles for getting the message across remain the same, proven by test under fire through the years, - chiefly seasonal press releases, and a continuing flow of educational articles in a disparate press. As has always been our wont, the Institute takes advantage of every promising opportunity offered. Sometimes we are lucky, sometimes less so, but a head of pressure is constantly maintained for filling all receptive channels with sound information emphasizing the usefulness of seeded lawngrasses. I feel that this continues to be highly rewarding.

Institute achievements have been gained economically, - unbelievably so compared to what a similar program would cost under big city, public-relations-house modes of operation. We have managed to hold our office expenditures in line with inflation, aided last year by the fortuitous circumstance of no large capital expenditures having been required. Rough budgetary comparisons are made for 1979-80 and the 1980-81 in Table I. Inevitably rising costs, such as postage and the press kit production, have been offset somewhat by cost-cutting in other categories. Travel expenses are linked to distance of meetings from home base; last year we suffered from the annual meeting being in San Diego, but gained by the agronomy meetings being held economically close by in Detroit. All in all, considerable influence was exerted at moderate expense, as the Treasurer's report has indicated.

TABLE I. EXPENDITURES, MARYSVILLE OFFICE 1980-81
(Exclusive of salaries and fringe benefits handled by Treasurer [in 1,000's])

	Spent 1979-80	Spent 1980-81
1. Press Mailings and Associated Expenses	7.9	8.2
a. Press Kits	3.5	4.4
b. Supplement	2.2	2.4
c. Reprints	1.3	0.7
d. Office Supplies	0.9	0.8
2. Travel	1.8	2.4
3. Rent and Utilities	2.9	2.7
4. Dues, Subscriptions, Postage	1.5	1.1
5. Hourly Help	0.5	0.5
6. Fixed cost benefits (hosp.) contributions	0.8	1.1
7. Misc. (equipment contracts, servicing, photography, operational expenses, etc.)	0.5	1.5

TOTAL 15.9 17.5

PRESS RELEASES

Last year's discussion pretty well epitomizes our modus operandi for press releases. The seasonal Institute press kits are a bread-and-butter activity, absorbing nearly half our operating budget. Additionally we are most appreciative of the ASTA Lawn and Turfgrass Division support, in sharing expenses for the spring "Supplement". This is the newspaper-format mailing, especially of importance for reaching non-professional gardening recipients, - newspapers, house organs, and give aways which don't engage professional garden-writing personnel, but rely upon copy-ready materials in conventional column spacing. It is also our means for offering illustrations under an arrangement whereby costs are shared by several associations. A hiatus in our national coverage would result were this activity not undertaken.

It is not clear just what will be the Supplement's basis for 1982. Pflaum indicates that several plans are under consideration; reduced page size, diminished lineage, and a search for added support are all mentioned. Apparently production costs have so soared that Pflaum Associates find the operation unprofitable carried on as in the past, with a limited number of sponsors. Participation certainly will be more costly in 1982 unless one or more of the economies mentioned are instituted. Pflaum has queried participants concerning their preferences, but as of the moment I have no further information on decisions. I see no real disadvantage were volume of material to be reduced something on the order of 20% by all participants, and would prefer this to enlarging sponsorship if the enlargement were to include many non-horticultural interests (such as swimming pools, spas, fencing, and so on, already participating).

So much for that particular operation. In general, releases to the press have gone smoothly, much as was summarized last year: Two chief means are adopted for putting information before editors, garden writers, and horticulturists. First, our own seasonal press kits (spring and autumn) are mailed in the now familiar "Green Grass" file folder and envelope with Lawn Institute logo. These go to a select and thoroughly winnowed mailing list totaling in the neighborhood of a thousand addresses. This mailing list is kept updated by Mrs. Scheiderer through whatever channels of information become available, with return-postage guarantee being one effective means for weeding out dead names. Guaranteeing return postage is expensive, but less costly than "wasted" mailings. Unit costs for the press kit probably average two dollars, even under bulk mailing.

Recipients of these kits are chiefly experienced garden writers who have come to know us and use our materials through the years, and who are talented enough to compose their own columns (therefore these releases are produced as double-spaced editorial copy rather than composed in tight, ready-to-use newspaper column form). Of course all of the stories are reworked until we feel they are well enough expressed to be used verbatim, and we encourage our recipients to feel free to do so if they wish, with or without credit. We recognize that most of these people are professionals, and prefer to put the stamp of their own personality on what they write. During the fiscal year 21 titles on 16 pages with 2 informational reprints included as background appeared in the autumn press kit; 23 titles on 17 pages with 3 reprints in the spring one.

Second, as has been noted, we cooperate in the production of the "Supplement", (Lawns, Gardens and Pools), a joint venture for 1981 with five national trade association sponsors:

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ANNUAL REPORT BY THE DIRECTOR - Continued

1. American Association of Nurserymen
2. International Fence Industry Association
3. Lawn Institute
4. National Bark Producers Association
5. National Spa and Pool Institute

This is a spring-only release, more voluminous than our own kits, sent to a less highly selected mailing list of over 3,000 addresses. It is printed in newspaper-column format for ready use by smaller newspapers, weeklies and house organs which do not enjoy the luxury of a garden editor. This is a more costly procedure in toto, the production in recent years being handled by William Pflaum Associates, of Reston, Virginia.

Unit costs of the "Supplement" must run three dollars or so per address mailed. However, cost to us is significantly decreased because of the sharing with the other associations, to one-fifth this amount. I don't feel that this dilutes our effectiveness, since the other associations have generally furnished sound copy and illustrations of good quality that complement what we have to say about lawns. As a matter of fact it may draw additional attention to our items to have people scan these pages for information about other facets of gardening. Also, participation in the "Supplement" provides us opportunity to offer illustrations inexpensively, taken from the Institute photographic pool that we maintain in Marysville.

A specialized first-class mailing to editors, garden writers and other professionals in the South is also undertaken. Here, too, is a select list from which dead names are culled and live prospects added continuously. We restrict this mailing to something less than 500 addresses, and have developed materials for it that are mostly different from our northern mailings (we stress winter overseeding with perennial ryegrass, for example). For obvious reasons we haven't as much of a story to tell in the South as we have in the North where most of the seeded grasses are used, so less copy is sent by "prestigious" first class mail in a letterhead envelope.

STORIES PREPARED FOR OTHERS

Integral to Institute activities is preparation of articles about lawns authored by the Director, for the popular gardening press and technical journals. Among those prepared and submitted, having appeared in print, or having been reprinted within the year are the titles listed in Table II. This continues the Institute tradition of supplying instructive materials of professional quality to an appreciative editorial corps throughout the pertinent publishing world. The cumulative total of published stories since the Institute's early years comes to around 300 custom pieces, - over a dozen per year. And this total does not include the many contributions made to a number of encyclopedias, as chapters in books, independently composed releases, or other contributions not circulated as reprints. The latter group carries especial weight, in that they are the reference materials for key professionals such as teachers and garden writers. Our overall effort smacks of abundance and fulfillment. We are pleased that the Institute has been so meaningful a force in furtherance of better lawns and their understanding.

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ANNUAL REPORT BY THE DIRECTOR - Continued

TABLE II - TITLES THAT WERE PUBLISHED, FIRST REPRINTED (Or
are in press) DURING THE FISCAL YEAR.

1. Turfgrass, The Times and Some Trends	American Lawn Applicator
2. Niche of New Lawn Cultivars	American Lawn Applicator
3. Fall for your Lawn	Country Gentleman
4. Lawn and Turfgrasses	Encyclopedia of Science and Technology
5. In Bluegrass Country - Lawn Repair Likely	Flower and Garden
6. Lawns Blossom in Autumn	Flower and Garden
7. Cultivar Listing	Garden Writers Assoc.
8. A Spring Tune-Up for your Lawn	Horticulture
9. Rebels in Tall Fescue Ranks	Landscape Architectural Forum
10. Autumn Jamboree in Lawnland	Landscaping Lawn and Garden
11. Lawnkeepers Calendar	Seed World
12. New Lawn Cultivars - An Industry Plus	Seed World
13. Lawn Cultivar Update	Seedsmen's Digest
14. Evolution of Improved Lawngrasses in America	Third International Turfgrass Conference
15. The Ever Changing Lawn Scene	Weeds, Trees and Turf

As members are well aware, added usefulness extends to these stories when they are reprinted. They can be used for answering inquiries, as mailing stuffers, for hand-outs at public presentations and by members, in documenting positions, and in other ways. Thus, not only is the readership of the magazine apprised at time of publication, but a much broader public experiences the output even for years thereafter. This is especially true for semi-technical items appearing in such well-regarded gardening journals as those of the Brooklyn Botanic Garden and New York Botanical Garden. Such acceptances allow us to initiate discussion on specialized topics the likes of lawn ecology and plant interrelationships. Reprints also enable us to key on a specific audience, economically: you are well aware of their utilization for background in press kit mailings, for example (Table III).

TABLE III - PRESS KIT STORY INCLUSIONS, 1980-81 FISCAL YEAR

<u>North</u>	1. Lawns Across America	American Nurseryman
Autumn 1980	2. Tips for Autumn Lawn Care	American Horticulturist
<u>North</u>	1. Greener Grass on Your Side of the Fence - Country Gentleman	
Spring 1981	2. New Lawn Cultivars. . An Industry Plus - Seed World	
<u>South</u>	1. How to Handle Your Lawn In Summer .	Flower and Garden
Winter 1980		

Perhaps the most rewarding utilization of reprints touches upon another facet of Institute activity, that of public correspondence. By virtue of offerings announced in press releases, instructive "leaflets" are made available upon receipt of a stamped envelope at the Marysville office. We are thereby able to place helpful materials in the hands of the most receptive readership in the world, - people interested enough to take the time for and to underwrite the

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ANNUAL REPORT BY THE DIRECTOR - Continued

expense of sending in a stamped envelope. At very little cost to the Institute we reach a surprisingly wide audience in this fashion, a trickle of requests being received almost constantly. It is often possible to tell which newspapers have made use of press kit materials by the surge of letters that comes from a particular location shortly after press kit mail-out!

Reprints are particularly effective because they bear an implied editorial "stamp of approval" by the magazine in which they have appeared. They thus carry an impression of authority that something printed up in-house would not. They are recognized for their editorial content; they are not "advertising".

I feel this enhances their appeal, and that they are therefore more often read through, rather than relegated to "file 13" with only cursory examination as are so many enclosures received by direct mail. Even though, to fulfill our objective of informing the non-specialist public, we must present our information in understandable, "popular" language, we can still utilize reprints for exchange within the scientific community. One such, with which we cooperate, has been formally organized under auspices of American Society of Agronomy. During the year eight reprints were sent to 71 recipients at universities and research centers throughout the nation, from whom technical publications are received in reciprocation that keep us abreast of research undertaken nationwide.

OTHER PURSUITS

1. Contacts - Turfgrass Conferences, Agronomy Society meetings, and participation in similar activities maintain some contact with technical people. This is extended by correspondence, some of it overseas. The Institute was asked to "go to bat" for the sod industry this spring, which eventuated in letters framed for officers of the national and Colorado associations, noting irrationality in an Aurora, Colorado ordinance (detailed elsewhere in this Harvests). The FIS, through president Rothwell, received a potpourri of items proposed for publication including "In Appreciation of Lawns", and "Legumes and Urban Conservation". We have kept in touch with the Garden Writers Association of America, by membership, correspondence and newsletter submissions. The Institute cooperated with E. Dexter Davis, horticulturist publisher of Greener Gardening easier, a monthly out of Massachusetts that frequently mentions the Institute. Davis, and "Doc" Abraham, syndicated columnist, are frequent correspondents with Dr. Schery. The Marysville office has followed through in correspondence with a guest editor for Nursery Business magazine, following up secretary Russell's questioning of a slanted view about the lawn seed industry's dedication to moderation.

2. Appearances - To the extent possible, personal presentations are made before interested groups if this does not entail inordinate travel or other expense. This spring, for example, two presentations were made at the Midwest Regional Turf Conference at Purdue (reviewed in the April Harvests).

3. Scientific - The Institute maintains liaison with turfgrass scientists, mostly employed by agronomy or horticultural departments in landgrant universities. Technical papers presented at the annual meeting of the American Society of Agronomy are a focus of this scientific interest, and we try to cover these presentations as well as tangential activities such as the turfgrass tour. At Detroit last year the Institute helped represent the ASTA at a reception for officers of the Agronomy Society and the press. Follow-through continues from the

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ANNUAL REPORT BY THE DIRECTOR, TO THE BOARD OF TRUSTEES - Continued

Third International Turfgrass Conference, where I have served as an associate editor for the Proceedings of that conference. The Fourth International Conference, incidently, will take place July of 1981, at Guelph, Ontario, Canada, and we expect to attend. We have reviewed the new Turgeon-Giles book, Turfgrass Management, for HortScience, journal of the American Society for Horticultural Science. The Chemlawn symposium on insects and insect problems was attended, and has been reported upon (January 1981 Harvests). A small donation was sent the Brooklyn Botanic Garden, the Plants and Gardens journal of which frequently carries Institute items. Special press kits were sent to the New York Botanical Garden, upon request.

4. Harvests - The quarterly newsletter, Harvests, not only details Institute activities, but epitomizes research reported in technical journals. This seems to afford a handy way for members to stay aware of diverse developments, and also pulls together a wide range of information useful for the Institute's program. During the fiscal year the four quarterly issues totaled 77 pages, 36 of them general news, 41 technical reviews.

5. Photographic Library - The attempt continues to oversee a photographic library, and to maintain a selection of colored slides concerning turfgrass. Illustrations are needed for stories, for presentations, and for the record. The photographs employed in this spring's "Joint Supplement" were from this source. When of benefit to the Institute, photos are released to newspapers, columnists and magazines.

6. Technical Library - A modest technical library of journals and books is also maintained, although this is becoming difficult to handle, mainly because of lack of space and manpower to oversee any sizeable collection of literature. Many additions are gratis to the Institute, such as when a book is reviewed or articles are provided trade journals.

7. Books and References - Books provide an impressive foundation upon which to build. Lawn Keeping is particularly useful as something to recommend where a more complete review is needed than proves possible with reprints and through correspondence. A hard cover issuance was made available this year at discount through the Institute. Revision of Plant Science, a college teaching text, was completed in 1981: its publication is anticipated in July.

8. Cooperative Publicity - We cooperate with other organizations and firms in furtherance of lawn publicity. One example is editorial review of the Chronical Guidance "Occupational Brief" having to do with landscaping and grounds care, Landscapers and Grounds Keepers. The Chicago Sun Times uses the Institute to answer lawn-related inquiries received from its "Action Time" program, Copley News Service was provided a couple of stories, "New Cultivars, a Lawngrass Breakthrough" and "Lawns in Summer", for national distribution. A listing of Variety Review Board cultivars was provided the Garden Writers Association of America for their newsletter. Materials were furnished the "Week-end Gardener" a new serialized TV program with national intent, newly organized. Free reprints for a stamped envelope have been offered through several channels, such as Free Things Publications. Also to educators through their associations and library publications, a much used service.

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ANNUAL REPORT BY THE DIRECTOR - Continued

9. Seed Samples - Seed of most Variety Review Board cultivars is on hand at the staff office for planting on the grounds, and for distribution as samples when requested. We do suffer for lack of first-rate storage facilities. A few distributions have been made, most notably (for distance of the request) to Northern Ireland (Dr. H. C. Lee, The Queen's University of Belfast).
10. Demonstration Plantings - Plantings of Variety Review Board and other cultivars are maintained. These afford first-hand experience for discussing "varieties", and lend authenticity to the Institute.
11. Correspondence and Internal Activities - A moderate but constant flow of correspondence, much of it inquiries, is handled by the staff office. Telephone counseling is also fairly frequent, included this year with organizations so prominent as Readers Digest. Goodwill correspondence is maintained with foreign countries, and literature has been provided for so distant a land as Saudi Arabia. The in-house leaflet, Lawns Across America has been utilized as a generally applicable informational fold-over, conveniently fitting a normal envelope.
12. Administrative - General administrative matters including banking are handled routinely at the Marysville office, although we are very much indebted to Treasurer Russell and his chief accountant, Walter Parker, for taking care of worrisome details such as figuring tax withholdings. An ongoing summary of administrative activities is, of course, reported quarterly in the Harvests. You are aware from Dr. Pepin's Variety Review Board report that consideration was given Falcon tall fescue and Norlea perennial ryegrass during the fiscal year. The staff office has also assisted the Executive Committee in review of the Institute's logo.

* * * * *

Mrs. Scheiderer joins me for the Marysville office staff, in thanking members for a pleasant and effective year. We are much indebted to everyone for courtesies extended. The officers have been most understanding, and diligent in devoting valuable time to furtherance of Institute affairs. In spite of a "slow post" to and from Canada, a cohesive international approach has been lent by our first Canadian president, Norman Rothwell, and we are much indebted. Bob Russell, as Treasurer, has somehow managed to keep his head above water in spite of the demands of high office in ASTA; we are most grateful. Thank you for your support, making possible another successful year for the Lawn Institute.

CALIFORNIA PEST PUBLICATION

Turfgrass Pests, with an accompanying Guide to Turfgrass Pest Control, was recently issued in the revised edition by the Division of Agricultural Sciences, University of California. This is a useful compilation to have at hand, if for no other reason than that California is so climatically specialized, with unique habitat changes and many unique pests. Lawn weeds are extensively covered, with charts showing their span of growth and seasons for various types of control treatment. Most of them are pictured in color. Many will not be familiar to easterners. Prominent insect pests are also pictured in color, and to a limited extent so are the major turfgrass diseases. The main book (leaflet 2209 revised January 1981), is 54 pages, priced at \$4, with multiple "authors" located both at Berkeley and Davis.

ROCKY MOUNTAIN SOD GROWERS ASSOCIATION PROTEST

Al Gardner, President of the Rocky Mountain Sod Growers Association, telephoned the Institute April 27, with respect to a campaign being directed against bluegrass sod in the Colorado area as a water-consuming profligate. An Institute letter previously written for the national association was dispatched also to President Gardner. It may contribute "outside" opinion to the protest the Association mounted in reaction to ill-founded regulations such as have been legislated by the city of Aurora, Colorado. The text reads as follows:

"In recent weeks instances have come to my attention where Kentucky bluegrass (*Poa pratensis*) has been singled out in a discriminatory fashion as a species whose use is to be inhibited for lawns and sod in the High Plains and the Southwest, in the belief that such repression would be instrumental for the conservation of water. In particular I refer to ordinance number 80-47, of Aurora, Colorado.

I believe that we can all agree, that when water supplies are in short supply restrictive measures must be practiced. I cannot agree, however, with many of the premises of the Aurora ordinance 80-47, nor do I feel that it is justifiable (perhaps not even legal) to single out a particular type of usage, in this case relating to but a single grass species, to bear the burden of water restrictions. Rather, it would seem to me, a fairer approach is to ration water for all users and usages, leaving it to the recipient to decide in just which ways he prefers to practice conservation (certainly many would feel that maintaining turfgrass under a minimal watering schedule is more beneficial to the environment and the community than, for example, washing automobiles, utilizing exaggerated waste disposal flushings, or even indulging in excessively prolonged showering).

I point this out because of the proven usefulness of Kentucky bluegrass as perhaps the outstanding lawngrass in the country. As a sod-forming species it has few peers; it is strong underfoot, probably the most economical and conveniently handled sod species. It protects and builds the soil as few other species do. It refreshes the air (through absorption of pollutants and emission of oxygen), cools the surroundings in summer and insulates them in winter. It is attractive, economical, easily maintained (not needing the quantity of irrigation implied in some recent releases), - in short, Kentucky bluegrass is an all-around boon to mankind for an urbanizing environment. There are today scores of cultivars to fit various uses and preferences, and certainly a bluegrass lawn allays dust and debris extremely well. One can still agree today with the tributes by John Ingalls, senator from Kansas 1873-1891, who stated in famous speeches, some before Congress (including "In Praise of Bluegrass"),

"Grass is the forgiveness of nature, - her constant benediction. - - All these marvels are attributable as directly to the potential influence of bluegrass as day and night to the revolution of the earth. Eradicate it, substitute for it the scrawny herbage of impoverished barrens, and in a single generation man and beast would alike degenerate into a common decay - - in more senses than one, all flesh is grass. But all flesh is not bluegrass. If it were, the devil's occupation would be gone".

In particular I question the wisdom and accuracy of section 39-79, of the Aurora ordinance, citing exemptions from the restrictions imposed upon bluegrass. Numerous species are listed as exempt, a number of them adapted to dryland habitat. However,

- Continued

most of them are not well adapted to mowed turf favored for lawns, and for which a convenient, economical infrastructure has evolved for its care. These are prairie and coarse field grasses, most of which would not survive under lawn usage, and all of which would need irrigation (perhaps prolonged) in order to become established into a prairie-like association. Some, of course, such as buffalograss, do make a low-growing turf under minimal maintenance, but are then generally warm-season (C_4) types growing aggressively in the summer season (and therefore demanding water then), when Kentucky bluegrass (a C_3 species) remains active in cooler weather and can if necessary turn dormant under drought yet still survive.

I call your attention to the widespread adaptation of Kentucky bluegrass west from Kentucky into the eastern plains, where much of the bluegrass seed was harvested before cultivar growing was initiated in the Pacific Northwest. There, without any irrigation at all, bluegrass prospered from Missouri and Kansas northward through the Dakotas into Canada, where it is still an important pasture and meadow species. There are bluegrass lawns in south-central Kansas maintained without irrigation, which are let turn dormant in summer to revive and become resplendent through autumn-spring. In my own experience here in the East, Kentucky bluegrass holds up without summer irrigation (and we have some pretty lengthy droughts many years) better than most other turfgrasses, including a number of fescues (a genus provided exemption in section 39-37 of the Aurora ordinance).

When the agronomy meetings were held at Colorado State University in 1979, Dr. J. D. Butler demonstrated and reported upon "Turfgrass Response to Irrigation Frequency and Amount", in an experiment of pie-shaped design receiving varying irrigation, and the research report notes, "It has been very effective for demonstrating to turf managers and homeowners the adaptability and turf quality of the test grasses as well as the best irrigation practices for local conditions". It seems to me this sort of scientific evidence is more proper than singling out bluegrass willy nilly, then exempting indiscriminately a diverse group of other species (most cultivars of which do not have the useful qualities for urban turf that do the bluegrasses)!

In particular I am surprised to see C_4 bermudagrass (*Cynodon dactylon*) exempted from the conservation measures imposed upon bluegrass. If there is any turfgrass in the world demanding intensive management, including a high level of all inputs, it is bermudagrass. And, as was noted above, its demands for moisture would be great in the summer season, its most active growing period. Comparisons of water consumption by various turfgrasses at the University of California, Riverside, have shown some slight advantage to warm-season species including bermudagrass, compared to several cool-season ones, but at the same time professional growers in the area have reported just the opposite. Partly water consumption depends upon human judgement as to necessity, and people must be taught not to over-irrigate to the point of luxury consumption. It is possible to have acceptable Kentucky bluegrass turf with only modest irrigation (no irrigation at all, most of the time, from Missouri eastward), and the reason for bermudagrass seeming to be more conservative of water is that its root system ranges deeply and draws more water from deeper in the soil helping keep the grass greener longer. I doubt very much, through an average summer, that bermudagrass can be shown to utilize less water than bluegrass if total consumption is considered, and if irrigation is properly regulated.

This is a rather lengthy discussion over points that may be apparent to you, but apparently are not to the public at large and to city officials such as the Council of Aurora, Colorado. I wonder if some effort should not be made to inform people having no expertise in turfgrass management as to inequities that arise when an ordinance such as that of Aurora, Colorado, discriminating as it does against a particular grass rather than controlling directly the intended objective of water conservation, is promulgated.

PRESS KIT IN PRODUCTION

The autumn 1981 press kit has been composed, and entered into production with Middleton Printing of Columbus, Ohio. Included are covering letter, sixteen pages of lawn items, and three documentary reprints. Target time for issuance is early-mid July. Emphasis this year is on new lawn cultivars.

STORY FOR AUDUBON MAGAZINE

Author Ed Williams, and editors of the Audubon Magazine, widely circulated journal of the Audubon Society, were in touch repeatedly with the Institute by telephone during April. This was with respect to a story being developed by Williams, involving the total importance of turfgrass and the basic background of grass species utilized.

REPRINT DISTRIBUTED

The reprint from Seedsmen's Digest, of the story entitled "Lawn Cultivar Update", was distributed to members in early June. Sufficient copies were retained for utilization in the autumn press kit. The story makes a handy single sheet (legal size) summarization of the activities of the Lawn Institute's Variety Review Board, with brief sketches of qualifying cultivars.

STORY FOR LANDSCAPE LAWNS AND GARDENS

A story entitled "Autumn Jamboree in Lawnland" was prepared for Arden Communications, publishers of Landscape Lawn and Gardens magazine in mid-June. The story is fairly elaborate, discussing features of autumn that make it a desirable time for lawn attentions. A back-drop of current matters of concern is provided. Instructions are given for planting anew, for renovation, and for winter seeding in the South. Variety Review Board cultivars are listed and briefly categorized under the heading "The Nifty New Cultivars". Several illustrations and a map are included.

ARTICLE FOR WEEDS TREES AND TURF

Bruce Shanks, editor of Weeds Trees and Turf, plans to run a comprehensive discussion entitled "The Ever Changing Lawn Scene" in a summer issue. The item tries to provide a fairly in-depth review of lawngrasses, - the species from which they derive, and the cultivars that are bred within the specific entities. Variety Review Board listings are provided. The article should make a useful summary of what the lawngrass situation "is all about".

INTERNATIONAL TURFGRASS CONFERENCE

Plans are being finalized for the Fourth International Turfgrass Conference, to be held in Guelph, Ontario, Canada, at the University of Guelph. Dates for the research conference, at which formal papers are presented, are July 20-23. The conference at Guelph is preceded by a tour of eastern Canada inspecting turfgrass facilities, and a subsequent tour of western Canada and the United States following the formal conference. A report on presentations made at Guelph will appear in a future Harvests.

REPRINT DISTRIBUTED

A reprint from the Flower and Garden Magazine, "In Bluegrass Country-Lawn Repairs Likely", was distributed to the membership in mid-April. You will recall that this story dwelt upon the left-over problems from 1980, - drought and lingering water deficits in particular, - and gave instructions for lawn repair, including renovation with the use of chemical knockdown (glyphosate). The new fine-textured tall fescues are given mention, and the story carries a list of "some modern perennial ryegrasses" as a boxed insert. This was offered as a seasonally pertinent item for more northerly states.

TOWARDS OVERSEAS PUBLICITY

President Rothwell responded to an invitation by FIS to provide information relating to grasses and legumes that might be channeled into news outlets worldwide. Several items relating to the usefulness of lawns were adapted from previous Institute releases, and a couple of new stories developed relating to the usefulness of legumes in combination with grasses, especially now that fertilizer from petrochemicals has become so costly. Mr. Rothwell forwarded these items to his European contacts in early May.

LAWNKEEPING PUBLICIZED

We are grateful to E. Dexter Davis, publisher of Greener Gardening, easier, for frequently giving the Institute credit for information releases. In the June 1981 issue of GGe Davis mentions availability of Lawn Keeping from the Institute offices at discount for the hard cover copy. We are pleased to receive this mention in a nationally mailed publication.

LANDSCAPE ARCHITECTURAL FORUM

Gail Gridley, editor of the Landscape Architectural Forum, telephoned the Institute in early June to confirm that the story prepared for her ("Rebels in the Tall Fescue Ranks") is in press and will appear in the July issue due out at the end of June. We had hoped to have a copy for display at the annual meeting, an objective that probably cannot be realized considering postal delays. The story emphasizes that the new "turf-type" tall fescues currently exemplified by Falcon and Rebel cultivars, represent new turfgrass opportunities for middle latitudes where it has been difficult to maintain the more familiar turfgrass species. We are indebted to Rich Hurley for a full page color print of the Congressional driving range (which sowed Rebel), as well as a black-white print from files in Marysville.

STORY PREPARED FOR TURF NEWS

Wendell Mathews, editor for the sod producers Turf News magazine, telephoned from Chicago at the suggestion of Doyle Jacklin, wanting a story for the July issue. Other Institute activities were dropped for a couple of days while "Basics Behind Topflight Sodgrasses" was readied. We look forward to its appearance in this upcoming issue of Turf News, an issue which is being devoted to grass seed production in its various aspects.

PLANT SCIENCE REVISION READIED

Due to appear in July, is the third edition of Plant Science, authored jointly by Janick, Schery, Woods and Rutan. This is a widely used teaching text in beginning agronomy and similar college courses. The third edition has been thoroughly revised and redesigned.

RECENT JOURNAL CONTINUES

American Lawn Applicator published its second issue of volume 2 in early spring, suggesting it is here to stay. Publisher-editor Arthur E. Brown pictures a staff of six on the masthead, and is lavish in the use of color illustrations. Advertising is still limited, and one might suppose the journal still requires subsidization. It is attractive, with full focus on turfgrass subjects (an intensity of interest perhaps exceeding its most similar special publication, Golf Course Management).

The March/April issue, in addition to an article on stripe smut reviewed elsewhere in this Harvests, carried these presentations: Hull, Rhode Island, on bluegrass energetics that included pick-up of nutrients during the dormant season; Jagschitz, Rhode Island, giving a complete review of weed control for cool-season grasses, with abundant colored illustrations; Dernoeden, Maryland, reinforcing the Jagschitz conclusions on crabgrass control; a Michigan State group's electron microscope pictures of a number of disease spores and insects; Vargas, Michigan, suggesting moderate summer fertilization and watering of bluegrass to help control Fusarium blight, and noting that triadimefon (Bayleton) is a new preventive (not curative) that has recently come along; Streu, Rutgers, noting that the winter grain mite is sometimes a pest on bluegrass; Johnson, Georgia, reviewing crabgrass and goosegrass control in bermudagrass turf, especially utilizing MSMA; Wasilewski, Michigan, discussing personnel selections.

SPRING KIT WELL UTILIZED

One of the newspapers coming to staff attention is the St. Louis Post Dispatch. The issue of Friday, April 24, was replete with materials from the spring press kit. Included were 11 stories spread over 8 pages, totalling 81 single-column inches of space. Even a few such usages make the cost of kit production quite worthwhile.

WATERING RESTRICTIONS THREATEN BLUEGRASS

Unfortunately Kentucky bluegrass has a reputation for needing an abundance of water in the high plains environment and the Southwest. In Santa Fe a native plant catalog claimed that maintaining bluegrass lawns required more than 4 ft. of precious water annually (while not indicating how much would be required to establish the various concoctions proposed in its stead). Ray Johnson, President of the American Sod Producers Association, telephoned the Institute office, concerned that emotional restrictions were shaping up in Colorado. For example, in Aurora (suburb of Denver), the council passed a regulation allowing only 500 yards of bluegrass sod to be laid on any 1/3 acre property, and a regulation is proposed that would totally ban seeding or sodding of bluegrass. This is ostensibly to conserve water, presumed to be abundantly needed by bluegrass; there are not, however, restrictions placed upon washing automobiles and other uses. Somehow the idea has spread that bluegrass lawns are especially profligate of water, which would hardly seem to be the case considering that many bluegrass lawns survive in such locales as south-central Kansas on natural rainfall alone (the lawn let turn brown through summer, to revive when cool autumn weather and rains arrive). It does seem as though discrimination is being levied against Kentucky bluegrass, for most of the time the rules do not apply to other species that would be at least approximately as extravagant of irrigation as is bluegrass. The Institute has done what it can, with a letter to the Sod Producers Association (for presentation to authorities where outside opinion is useful,) indicating that Kentucky bluegrass is no more of a water glutton than are other fine turfgrasses, and that intelligent irrigation can keep bluegrass lawns alive with a total input of water far less than such amounts as were stated in the Santa Fe catalog.

NEW ISSUE OFFERS PROMISE

Darlene McDonald, Better Times magazine, writes "Better Times is an encyclopedia of consumer information - - purchased at the supermarket check-out counter. A million copies will be offered for sale every month beginning in January of 1982". She goes on to ask for information in several categories, of which the Lawn Institute could obviously help in supplying items on "Plants and Gardens", but in related categories as well. Ms McDonald will receive our autumn press kit, and in the meanwhile has been supplied several items of literature and an offer for custom help.

LEAFLETS OFFERED

A note from Jon Davis, Free Things Publications New York, mentions a gardening publication by Putnam ready for the spring of 1982 that will receive national distribution, in which "free things" (meaning \$2.00 or less) are listed. The Institute has offered informational leaflets, including the Variety Review Board tally of cultivars, for an addressed, stamped envelope received at the Marysville staff offices. This is an example of an effective way in which the public can be reached quite economically.

COMMEMORATIVE STAMP PROPOSED

At the annual meeting, President Rothwell and others offered the suggestion that a commemorative United States postage stamp would afford an excellent opportunity for publicizing the usefulness of seeds, with at least one issue emphasizing lawn-seed. Vice President Bob Peterson, a philatelist, was most enthusiastic about the idea, and is pursuing it with the national ASTA offices in Washington D. C., to see just what steps are needed for the idea to receive consideration. This would seem especially appropriate for the centennial year of the American Seed Trade Association, 1983. Mr. Peterson has found that thousands of suggestions are advanced each year to the postal department for commemorative stamps: only a few can be chosen, although all are considered. A centennial event, and a basic "cause" such as seed represents, would seem to offer substantial appeal for a commemorative stamp. Bob Peterson will report back concerning the avenues likely to be fruitful for such a proposal.

MEETING ANNOUNCEMENTS ISSUED

An announcement of the election of Officers and Board of Trustees consummated at the recent annual meeting in Atlanta, was mailed to all of the pertinent trade publications which carry "news about people" sections. A few extra copies are on file should they prove useful to anyone.

TRAVEL PLANS FOR DALLAS

Eastern Airlines has assigned a coordinator, Kathy Fitzgerald, for the Institute regarding flights to Dallas for the 1982 annual meeting. If 10 persons seek transportation, a "group fare" can apply. The toll free number with which to inquire of Eastern is 800/323-7323 (in Illinois 800/942-3010), extension 4047.

INSTITUTE COVER PICTURE

Dr. Keith Karnok, Ohio State University, telephoned the Institute asking permission to use an illustration of Poa trivialis (taken from Lawn Keeping) for the cover of the field day hand-out booklet. Field day is held in early August, at the Ohio State campus, Columbus, Ohio.

TECHNICAL SECTION
NEW JERSEY RESEARCH REPORTS

The 1980 Turfgrass Proceedings from Rutgers, State University of New Jersey (S & C Vol. 11, "Green Power") was received in May. It is the customary, detailed presentation, 154 pages in length, the early portion (white pages) generally presentations made to the Expo audience, the latter part (green pages) turfgrass performance reports by the Rutgers Research Staff.

The opening paper is by Smiley, Cornell, in which he emphasizes that the cause for fusarium blight is not known; it may not often involve a Fusarium fungus! Smiley's report epitomizes an Ohio publication on this subject, and provides the intriguing theorizations for which he is known. Physiological conditions are first discussed, which may be predisposing to disease. Some attention-getting statements include: "low quality turfgrass stands are usually less affected by fusarium blight than are high quality stands," and "fusarium blight was most severe - - where thatch decomposition rate was highest". Anaerobiosis (blight is usually most evident under wet conditions, especially following drought), release of phytotoxic substances from roots, leachates and decomposition products, ethylene accumulation under warm-flooded conditions, all may have an influence.

Smiley would avoid management measures that encourage rapid growth during hot weather as a means of restraining fusarium blight on bluegrass; he would increase mowing height, avoid water or mineral deficiencies or excesses, etc. He feels that applications of fertilizer during the late spring and during the summer is not advisable where fusarium blight is known to occur. He suggests that fertilization increases thatch decomposition rate, which can lead to "accumulations of toxic metabolites during periods of excessive wetness". The disease has not been fostered by fungicides which are not toxic to Fusarium, but has been increased by certain herbicides. It is not spread by leaf clippings. Smiley concludes: "Evidence that fusarium blight of Kentucky bluegrass can be caused by a single pathogenic agent such as Fusarium is weak. It seems more probable that any of several unspecialized root-infecting parasites could be associated with the disease".

C. Reed Funk agrees with Smiley, that a number of predisposing factors influence fusarium blight. He states, "A variety such as Vantage which is less tolerant of close mowing than some of the compact turf-types, may show very little fusarium blight at a 2-inch mowing height. It can be weakened by close mowing to the extent it becomes moderately susceptible". But Funk feels that genetics plays a role, and that breeding can aid in controlling Fusarium. He notes the need for more low-maintenance bluegrass germplasm from middle latitude and southern locations. Persistent mowing of bluegrass in the Middle Atlantic regions favor genomes that are broader-leaved, more prostrate, fairly open and with extensive deep rhizomes (Vantage and HT-1 are examples). These generally do better in more southerly climates than the dense, low-growing cultivars typically marketed, which are best suited to cooler climates, moderate humidity, and generous fertilization. He feels there may be a fourth type having southern adaptation that is highly pest-resistant and tolerant of both heat and drought. Improvement within this group is the challenge for bluegrass breeders. In New Jersey testing very few bluegrasses were seriously afflicted by Fusarium (Nugget, however, was badly hit; Geronimo rather severely; Baron and Ram I moderately). But almost all cultivars were rather severely afflicted when calcium arsenate was used (which repressed earthworms, and caused increase of thatch.)

Funk goes into even greater depth discussing perennial ryegrasses. He notes their rapid rise to favor, and the possibility of securing even more favorable germplasm from rigorous climates of the Near East and Russia. He would still combine

NEW JERSEY RESEARCH REPORTS - CONTINUED

a few good bluegrasses with perennial ryegrass, realizing that in some environments bluegrass may sooner or later squeeze out the ryegrass. He notes some successful ryegrass-bermudagrass combinations in the Washington D. C. area. Winter injury to perennial ryegrass may come from species of Drechslera (brown blight), with Manhattan, Yorktown II, Blazer and Yorktown rating most resistant; Linn, Birdie, Pennfine, Citation and Ensporta least resistant. Summer performance, reflecting heat tolerance and Rhizoctonia brown patch resistance, show Pennant, Blazer, Fiesta, Citation rating highest; with NK-100, Hunter, Caravelle, Sprinter and NK-200 low among recognized cultivars. The promising qualities of Elka are emphasized, as is the wear tolerance of perennial ryegrasses generally (good, especially at times of major growth and regrowth). Poor mowing quality has largely been corrected by breeding, but the early seeding cultivars (e.g. Regal, Citation, Derby, Pennfine, Birdie, Pennant) have more difficult-to-mow culms in late spring than later maturing varieties (e.g. Loretta, Manhattan, Diplomat, Blazer, Yorktown II).

Funk notes the deeper color of Citation and Yorktown as especially suitable for blending with bluegrass. He feels that the new ryegrasses can withstand moderate shade, and in fact mow more neatly when growing in cool shade. All are rapid to establish, but can suffer from seedling Pythium attack. Seed quality is generally good, but care should be taken that coarse types (including annual) are not included in seed lots. Rust and other less familiar diseases can sometimes be a problem, but all in all great progress has been made in producing useful perennial ryegrass cultivars, and many more can be expected in the future. Funk concludes by offering alphabetical paragraph summaries of the major ryegrass cultivars.

Engle appraises perennial ryegrasses for fairway plantings. He feels they may not be reliably hardy north of New Jersey, and that they will not mow so easily as bentgrass and bluegrass. But they may adapt to poorer soils, require less care, and irrigation, and suffer less disease than bentgrass. They withstand traffic reasonably well, and compete well with weeds. He would mow at 3/4 inches. Ryegrasses do not thatch so readily as familiar fairway species.

Harper, Pennsylvania outlines athletic field maintenance procedures. He suggests late winter overseeding and soil testing. Aeration and overseeding can begin in spring, as might weed control. Irrigation and weed control demand attention in summer, with irrigation and fertilization "musts" in late summer and autumn.

Earley, Lawn Care Industry, discussed advertising. This was mainly based upon a survey made by his publication, and related to the lawn care industry. Mayer, Scotts, discussed quality in lawnseed, and how to keep it in good condition. Atkinson discussed the New Jersey sod certification program. State authorities will supervise seed blending for sod growers. Strict specifications have been developed for seed going into the certified sod growing program. Seed blends must follow formulation approved by the college, and are blended in proper proportions without decision by the grower if the sod is to be certified.

Ben Warren, Illinois, discussed "Quality Sod". He has never considered fescues or ryegrasses to contribute much to sod quality. Pains taken in growing and harvesting are discussed. Meade, Rutgers, reviewed aquatic weeds and their control. Hannigan advises on "Lake and Pond Care", primarily as practiced at Rock Spring Club. Belzner, from Pennsylvania, spoke about pond aeration, stressing biological treatments. Jones, a golf course architect, reviewed securing and handling water. A series of papers dealt with sprays and spraying equipment. Miller and Wilkinson, ChemLawn, reviewed compatibility of pesticides and fertilizers in tank mixtures. Radko of the USGA, discussed preparing courses for championship play. Zontek, USGA, discussed problems and happenings in the Northeast.

NEW JERSEY RESEARCH REPORTS - Continued

The performance reports by the New Jersey research staff open with discussion of fine fescues. The differences between Chewings, creeping (spreading) and slender-creeping are detailed. With 1972 seedings Banner and Jamestown Chewings have had the highest average ratings for 4 years, with Menuet and Highlight not far behind. For a 1976 seeding, averaged for 3 years, Jamestown and Shadow rated best, with a Loft FL-1 hard fescue and Banner not far behind. The same leadership generally held at Adelphia.

Similar, even more extensive evaluations of Kentucky bluegrasses have received attention. America, Plush, Majestic, Adelphi, Bonnieblue, among others have shown above average resistance to stem rust and dollarspot. Ratings for a 1974 planting averaged from 1975 until June of 1978 showed these same cultivars among the leaders. Majestic, Plush, Bristol, Brunswick and Admiral all showed little dollarspot affliction; while Emnundi, Baron, and Ram I, were moderately blemished; Touchdown, Cheri and Nugget severely so. In two separate trials started in 1975 at North Brunswick, considering named varieties only, Princeton 104, Eclipse, Adelphi, Bonnieblue and Touchdown led the ratings. Baron, Geronimo, Vantage, Nugget, and Wabash rated rather poorly for average "turf performance". Duplicate plantings at North Brunswick in 1976 showed Eclipse a strong leader, followed by Touchdown, Majestic, Adelphi, and others not far distant in one of the runs. Adelphi, Columbia and Touchdown were the leaders in another. Park was by far the poorest rating cultivar in both series. At Adelphia, Eclipse showed strong performance, followed by Adelphi and other familiar names, with common types rating lowest.

Among the perennial ryegrasses at Adelphia, considering a two year average of a 1977 planting, Blazer led followed by Ranger, with most other recognized varieties clustered not far behind. In another planting, considering 1979 only, Barry led, followed by Ranger, Blazer, Belle, Yorktown II, Fiesta, and Dasher. In both instances Linn was a poor last.

Engel and Busey discussed the effectiveness of pre-emergence crabgrass herbicides. Bensulide gave best control (99%) with oxadiazon almost as good (90%). Oxadiazon caused some temporary discoloration of the turf. The results reported were for 1979, which was a wetter than usual year. Benefin also gave excellent results when used at double the normally recommended rate.

Various tall fescue cultivars now in production are characterized, including Falcon and Rebel. These two cultivars rated quite superior for turf (Falcon was not yet available for some of the earlier comparisons).

Engel reviews characteristics that give quality to golf putting greens. Management measures relating to these desired results are discussed. A final paper deals with "Finger Printing" of turfgrass varieties. Electrophoretic techniques provide a banding pattern with extracts, usually distinctive for the cultivar. While this is a technically demanding procedure, it is much more speedy in determining true identity of a seed lot than would be growing-out tests.

TALL FESCUE SOD PRODUCTION

Carrow and Sills, Kansas, report in the December HortScience, on "Tall Fescue Sod Production with Plastic Netting". Utilizing Vexar netting, tall fescue sod was superior than when planted without netting. In particular the tensile strength of the sod was several-fold greater. Quality was also slightly higher (which may have been partly due to greater wash of seed by rainfall in plantings that did not have the netting). Heavy seeding rates provided more attractive shoot texture but increase Helminthosporium leaf spot. Good quality sod could be produced with netting in about 4 1/2 months with a spring planting.

TEXAS TURFGRASS RESEARCH

Jim Beard sent a 96-page report from Texas A & M University, "Texas Turfgrass Research - 1979-80" in April (the report dated January 1981). This is a thorough, if sometimes abbreviated, discussion of ongoing turfgrass activities in Texas. It opens with a discussion of turfgrass usage in the state, and indicates approximately 3.1 million acres of turfgrass plantings in Texas, involving annual expenditures of approximately \$620 million dollars. A lengthy list of benefits runs the gamut from soil stabilization and pollution control through recreational activities to esthetic appreciation (contributing to mental health and social benefits in urban areas). The thrust for the future is expected to be the uncovering of lower-maintenance cultivars and practices that will contribute to water and energy conservation.

The winter of 1979-80 in Texas was mild but with a late, cool spring. SAD virus was severe on st. augustinegrass, and weed problems were abundant. Spring root die-back of bermudagrass and st. augustine was not experienced as had been the case the previous three years, and it is theorized that with the delayed spring there was not the competition for carbohydrate between shoots and roots that is customary (see review elsewhere in this issue of Harvests).

Horst et al review their experience with mulching mowers at El Paso. The mulching technique increased growth of tall fescue 1.7 times. Johns and Beard discuss turfgrass watering, and conclude that environmental factors (light, humidity, temperature, wind) are more influential than are inherent characteristics (such as stomatal openings).

They theorize that low-growing turfgrasses treated to restrict excessive leaf development (avoid over-fertilization, limit growth, etc.) are conserving of moisture. An evaluation of 16 nitrogen sources showed UF to be slightly the best, followed closely by SCU and soluble inorganics. IBDU was least satisfactory, statistically less significant than the others (attributed to the possibility of an alkaline soil reaction).

Nineteen bermudagrass cultivars were tested for low temperature hardiness. 'Midway' (from Kansas) was far the most hardy, and 'Midiron' also comparatively quite hardy under "severe" cold stress. Under moderate cold stress not a great deal of significant difference occurred among familiar cultivars, although Tiflawn, FB119 and Ormond ranked lowest. As to wear tolerance Texturf cultivars ranked highest followed closely by Tiflawn, Ormond and Tifway; Pee Dee, Tifdwarf, and Santa Ana were inferior. The various bermudagrasses are also characterized for seasonal performance, including spring green-up and winter color (Santa Ana, FB119, Texturf 1F and Ormond were top-ranked for low temperature color retention in autumn).

St. augustine cultivars were also characterized, but varied considerably depending upon the characteristic tallied. A Garretts selection (of which seed is available) is exceedingly fine-textured, but rated poorly in "quality". The search is still on for more attractive st. augustine selections, which must have SAD virus resistance, reasonable cold tolerance, at least normal adaptation to shade, and chinchbug resistance.

Of greater interest to members will be the winter overseeding tests. In this particular winter, polystands outperformed monostand seedings (the season was not a particularly good one for perennial ryegrasses, which suffered early bermuda competition from a warm autumn, then was stalled by sudden December cold.)

TEXAS TURFGRASS RESEARCH - Continued

Combinations including 10-25% Sabre rough bluegrass were particularly outstanding. Rating highest among the ryegrasses as monostands were: Barry, Hunter, Loretta, Citation, and Yorktown. Kimono showed up well among the Kentucky bluegrasses, and the researchers note that "Fescues as a group were unacceptable for winter overseeding under wet conditions.". Also, bentgrasses were found unacceptable. Of the 34 perennial ryegrasses tested individually, Yorktown-Yorktown II were tied for 4th, Citation 6th, Regal 12th, Omega 13th, Manhattan 14th, Blazer 18th, Derby 20th, Pennfine 21st, Fiesta 22nd, Diplomat 23rd, NK-200 24th, NK-100 34th, and Game last.

Another aspect of wintergrass planting studied was ability of the cultivar to resist Poa annua encroachment. Sabre rough bluegrass was outstanding. Those perennial ryegrass cultivars which got off to a fast start were also helpful, the density of ryegrass in January compensatorily restricting annual bluegrass. Results in general paralleled previously mentioned ratings for the ryegrasses. Fine fescues and bentgrasses provided almost no Poa annua repression. One pound of nitrogen per 1,000 square feet applied in January was generally as good as (and sometimes better than) one and one half pounds, and superior to one half pound for encouraging dense wintergrass.

When 20% of Sabre rough bluegrass was mixed with 80% perennial ryegrass, winter performance rated statistically as good as higher rough bluegrass rates (even 100% rough bluegrass). Less than 10% rough bluegrass, however, was unsatisfactory. Heavier fertilization rates improved "performance", but decreased wear tolerance. Nor was rough bluegrass as tolerant of wear as perennial ryegrass. The Texas researchers suggest that between 10 and 25% rough bluegrass be used in mixture with perennial ryegrass for winterseeding golf greens.

Timing of winter seeding was investigated. It was found that soil temperature at a 4 inch depth (or even a 1 inch depth) was perhaps a more stable indicator than surface temperature. Turf coverage increased directly in proportion to soil temperature, and best results were achieved when soil temperature ranged between 72 and 78° F.

Tall fescue continues to look very promising for shaded sites in Texas. There was no statistical difference among ratings of the top several cultivars, which included three experimentals not commercially available, Kentucky 31 and Rebel. Testing golf ball roll on golf green turf after various treatments produced no great surprises, except that double-mowed turf was sometimes slower than single-mowed cover (perhaps because more foliage was removed, and the stubble left provided more resistance to roll?). Dew removal, foot printing, topdressing, and core cultivation were all tested.

Colbaugh reported favorably upon a new fungicide (GA-1-105) for controlling Helminthosporium leaf blotch on bermudagrass; there were also indications of seedhead repression, without phytotoxicity to the turfgrass. Various fungicides were tried for control of brownpatch on st. augustine. Little significant difference was found, but Subdue seemed one of the more effective fungicides. Treatments to control grubs proved erratic but the pests were generally reduced significantly by chlorpyrifos; the authors emphasize that time of insecticide application is important (treat when the grubs are attainable, not during seasons when eggs, pupae or adults are evident).

Goosegrass was controlled in bermuda turf quite well with pre-emergence oxidiazon. Prosulfalin and metrabuzin also performed well, but DCPA and bensulide were

TEXAS TURFGRASS RESEARCH - Continued

unsatisfactory. Asulam was fairly effective for controlling crabgrass in st. augustine. as were MSMA and combinations of MSMA and metribuzin or methazole. The same chemicals were generally effective in stopping dallisgrass (Paspalum dilatatum) in both bermuda and st. augustine, but in most cases two applications were needed. Annual bluegrass was controlled in dormant bermuda turf quite well with glyphosate, and also with metribuzin (metribuzin yellowed bermudagrass, however, if it was at all green). Paraquat was too phytotoxic to the bermuda, and pronamide was rather ineffective under Texas conditions.

Mixing of organic matter in soilbed preparation to various depths, and types of organic matter used, were compared. Sewage sludge and Michigan peat treatments stimulated greatest turf coverage (possibly because of fostering greater soil moisture and nitrogen availability). Surprisingly, mixing organics through the complete soil profile proved least satisfactory (shallower incorporations near the surface were better). The tests were conducted on synthetic soils compounded to USGA specifications (much sand, 10% or less soil, 20% or less organic on a volume basis).

WATER CONSUMPTION AND GROWTH RATE OF TURFGRASSES COMPARED

Biran et al, Israel, report in the Jan.-Feb. Agronomy Journal, on comparison of 11 turfgrasses for water consumption under varying conditions. The warm season (C-4) species utilized were two cultivars of bermudagrass, Paspalum vaginatum, kikuyugrass, st. augustinegrass, zoysia matrella, centipedegrass and zoysiagrass; cool season entries were tall fescue and perennial ryegrass. Invariably, the warm-season (C-4) species were much more efficient than the cool-season (C-3) ones, tested under field conditions container grown. However, many grasses utilized water abundantly if it was supplied for luxury consumption.

Grasses with sparse, vertical growth, grew more rapidly and consumed more water than did dense, low-growing ones. Delaying irrigation until onset of wilting decreased water consumption (and growth) in most cases. Raising the clipping height (from a little over an inch to about 2 1/2 inches) increased the vigor of all grasses, and therefore also increased water consumption. Under constant warm temperature (about 95° F.) net photosynthesis of tall fescue was only about 1/3 that of the warm-season grasses, even though evapotranspiration was equally high. Water uptake continued with zoysia at temperatures materially above the point where cessation began with other species.

The authors suggest that rather than choosing grasses on the basis of temperature adaptation, that it might be wise to consider water consumption in areas where water is increasingly expensive and often difficult to obtain.

ALLELOPATHY IN TALL FESCUE

Peters and Zam, Missouri, report in the Jan./Feb. Agronomy Journal on the repressive influence that some selections of tall fescue have on competing weeds (crabgrass) and legumes (which might be interplanted in pastures). While a degree of such allelopathy seems to exist generally in the species, certain genotypes (selections) exhibited it much more manifestly than did others. In some cases, the soil in which tall fescue had been growing was repressive to germination of crabgrass, and to the growth of birdsfoot trefoil or red clover. Obviously, allelopathic inhibition can be useful as well as being disadvantageous under other circumstances.

CALIFORNIA CONFERENCE

The Proceedings of the 1980 California Golf Course Superintendent's Institute, University of California, Davis, "Integrated Pest Management", was received in April. This is a very thorough ~~view~~ by University of California specialists, dwelling as much upon pure science background as upon immediate technical matters. In fact, many of the presentations seem presented at a level for peer understanding, and their significance may be difficult to absorb in a quick presentation even to a knowledgeable group of golf course superintendents. On the other hand the published Proceedings provides a valuable overview of the "state of the art" in pest management.

California has been especially restrictive with pesticides; some of the papers deal with their handling, storage and registration. Harivandi notes the influence of pH on pesticide effectiveness, and substantiates what has been reported previously in Harvests (Chen-Lawn Symposium) that a high pH drastically reduces the half-life of most mixed sprays. pH can also significantly control availability of soil pesticides, and their phytotoxicity.

Madison sets the stage with a provocative paper relating cultural methods to pest incidence. He adopts the ecological approach, which Smiley of Cornell has been so identified with in recent years, recognizing a "balance" among pathogens competing one with another. He states, "Each fungus makes its own brand of antibiotic to suppress the growth of its neighbors". Only under exceptional circumstances (e.g. improper management, drastic weather change) is there likely to be a disease breakout. He cites the example of quick build-up of genetic resistance to a pesticide when it is used repeatedly, whereafter the pesticide may control predators of the pest but not the pest, intensifying the disease. He, and other specialists in California, follow Endo's idea that if thatch dries out many of the beneficial organisms "close shop", then don't revive in time to counter some of the disease-causing ones when the dry thatch is re-wet (therefore, keep thatch moist, rather than alternately dry-wet). Madison feels that soil compaction is often a predisposing factor, intensifying over-watering, too-intensive nitrogen feeding, etc.; disease is ultimately blamed, but the predisposing factors make disease possible. Of the regimen supplied putting greens, Madison wonders "if we are working hard to favor pests". His advice for turf management generally is to do nothing that is not necessary; minimizing management also minimizes pest problems.

Bayer gives details on the usefulness of differing types of surfactants for use with pesticides. Ehler discusses "classical biological control" of pests, whereby both native and introduced predators can be used to correct problems; however, each case is individual, and must be worked out for the particular circumstances. Hield reviews growth regulators. He notes that frequently their use intensifies insect or pathogen problems (treated Kentucky bluegrass may have greater billbug infestation, or rust; "high use turfs should not be treated"). He notes that inhibitors such as Embark reduce cell division, and tend to cause a degree of undesirable color; retardant types, however, shorten internode length and don't cause unacceptable color. EL500 is showing considerable promise in the latter category, and incidentally seems to have preemergence weed control influence on both oxalis and annual bluegrass.

Wu considers the ecology of grasses, and notes that certain species are favored by certain habitats, utilizing mostly data from the British Isles. He notes for example, the better adaptation of bentgrass and fine fescue to acid conditions, than Kentucky bluegrass and annual bluegrass. Extensive ecological counts have

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CALIFORNIA CONFERENCE - Continued

been made noting what kind of habitat accomodates fine fescue as compared to perennial ryegrass, for example, and what influence certain practices (such as liming) may have.

McHenry reviews plant characteristics that influence herbicide selectivity. Elmore reviews the mechanisms by which herbicides kill. Pond weed management is discussed by Donaldson. Cudney et al discuss ways of making turf from kikuyugrass, part of which may involve use of glyphosate (to eliminate competition before planting) and siduron (to prevent competitive cool season grasses such as perennial ryegrass and tall fescue). Gibeault discusses the pros and cons of Poa annua, measures to encourage it or restrain it.

Elmore covers the fundamentals of broadleaf weed control in turfgrass. A newer herbicide, triclopyr (Garlon), has been very effective in controlling oxalis corniculata, a problem in California. McDonald reviews the fundamentals of disease organisms as they involve ornamentals as well as turf. He emphasizes the cyclic sequence which can be broken at any point; only one link in the chain involves pesticides. He states, "by the time symptoms become evident, the pathogen is already well established in the tissues. There are many other links that could be targeted as well, and the challenge facing those responsible for disease control is to be knowledgeable of all options - - -".

Raabe discusses how fungicides work, and then reviews several diseases of trees. Kohler examines how insecticides kill insects, and Bowen relates this to some of the more common insects affecting golf course turfgrasses (webworm, cutworm, skippers, fruit fly, grubs, billbugs). Ohr discusses "Summer Turfgrass Disease" (with brownpatch, dollarspot, fusarium, pythium and southern blight being most serious). McCain then turns to winter turfgrass diseases, things typically affecting cool-season grasses (stripe smut, rust, red thread, melting out, brown patch, fusarium, spring deadspot).

Other papers review insects that attack conifers and shrubs, controlling mammal pests (such as pocket gophers and ground squirrels), laws and regulations involving pesticide use, selection and maintenance of application equipment, calibration, and an appendix listing the 6-day symposium program with names and addresses of all participants. This "Institute" seems to be one of the most thorough-going in the country, and is a credit to the organizational efforts in California.

PHYTOTOXIN FROM QUACKGRASS

Quackgrass, Agropyron repens, has long been known to have allelopathic influences on pasture legumes and other forms of companion vegetation. A study by Gabor and Veatch, in the March Weed Science, further elucidates the phytotoxin. It proved quite inhibitory to corn, oats, cucumber, and alfalfa; its general chemical characteristics are given (apparently it is a glycoside with a molecular weight of about 460, but its structural configuration has not yet been worked out).

The same sort of phytotoxicity was found from residues (roots or shoots) of Canada thistle, Cirsium arvense, as reported by Wilson in the same issue of the Weed Science journal. Chemical identification was not attempted, but Canada thistle residues incorporated into the soil inhibited growth of a number of Monocots and Dicots. The author has found similar repression from milkweed, kochia, barnyardgrass and lambsquarters, attesting to the ubiquity of allelopathy.

ROOT DIE-BACK REEXAMINED

Beard, Texas, discussed in the January Grounds Maintenance, 1980 results on spring root die-back with bermudagrass and st. augustine. Findings were contrary to happenings the three previous years. Previously there had been a traumatic interval just at or after new shoot formation in spring, during which a goodly portion of the root system of these grasses browned and died, and required two or three weeks to regenerate. In 1980, however, with a cool, moist spring that restricted shoot formation, there was no root die-back. Beard theorizes that normally shoot formation places heavy demand for carbohydrate energy upon the plant system, drawing this away from the roots, which then die-back. Because the cool temperatures restricted shoot growth in 1980, this drain on root nourishment presumably did not occur. The theory is supported by the fact that in prior years a sucrose (sugar) application to the grass hastened root regeneration, but in 1980 had no influence, seeming to indicate no deficiency in carbohydrates in the root system. Whether or not this partitioning of resources during critical spring revival is generally manifest or not, common sense would indicate that mowing to retain as much green leaf as possible, balanced fertilization so as not to stimulate excessive foliage (as from nitrogen feeding), and care with pesticide applications and mechanical abrasions, should be taken to help bermudagrass and st. augustine through this difficult spring transition. Beard had previously theorized that spring die-back might be a universal phenomenon with turfgrasses, and, indeed, the same precautions make sense for bluegrass lawns in the North.

STRIPE SMUT DISCUSSED

Hodges, Iowa, provides a provocative discussion of stripe smut in the March/April American Lawn Applicator. He points out that stripe smut disease of bluegrass is quite complex, infection occurring from teliospores in the soil only through the coleoptyle or new branches shoot, for a limited few days. But once the disease infects the plant it becomes systemic, and as the plant spreads, daughter plants are diseased. The disease generally dies out in hot dry weather (with grass plants perhaps dying, and being replaced by healthy ones), so that the stripe smut is usually not a problem on relatively untended turfs, but rather on those that are well-fertilized and watered. Infection spreads slowly, and leaf blades of infected plants often are stimulated to extended growth. Flag smut is indistinguishable from stripe smut appearance, but under the microscope the teliospores are entirely different. So is progression of the disease (flag smut affects the plants quickly, stunts the root system, and usually resulting in death of the bluegrass even under minimal maintenance). Systemic fungicides such as benomyl are recommended to control stripe smut, applied in early autumn and early spring, seasons when bluegrass would normally be spreading by tillers and rhizomes. Even better would be use of smut-resistant cultivars. Hodges notes that a number of common type bluegrasses are quite susceptible to stripe smut, as are such major cultivars as Baron, Fylking, Merion, Sydsport and Windsor. If stripe smut is present, its manifestation will be intensified by generous care of the turf, so that in most cases a minimal maintenance program should be initiated.

POA ANNUA WEARS WELL

Canaway, reporting in the Journal of the Sportsturf Research Institute (reviewed in the fall 1980 New Jersey Green World) finds that Poa annua resists wear better than any of the other species tested, this under British conditions. Kentucky bluegrass and perennial ryegrass ranked closely for second-third (varying with the amount of wear). These findings support Shildrick's previous conclusions.

SMILEY ON THATCH

Smiley, Cornell, provides an in-depth review of thatch biology in the April Weeds, Trees and Turf. He establishes first the biological fundamentals relating to plant growth and decomposition of organic matter. Thatch accumulation will, of course, vary with the rate of growth, the chemical composition of the plant or plant parts, and factors which encourage decomposition (such as temperature and moisture). Cellulose, abundant in old tissue, and hemicellulose, abundant in fresh leaf, decompose rather rapidly; lignins more slowly; waxes and phenolic compounds very slowly. Smiley cites a number of litter studies undertaken with grasslands and as ecology projects.

The beginning of decomposition seems chiefly due to fungi, with other microorganisms (such as bacteria) quickly "getting into the act". All are fed upon by nematodes and other predators. Smiley feels that earthworms and small animals are rather incidental to the decomposition of thatch, helpful only to the extent that they fragment organics and help aerate the medium. Earthworms are thus an indicator of the richness of a biologic community, rather than cause for it; they do reflect conditions conducive to fairly rapid thatch decomposition. Pesticides can deter decomposition, as might unbalanced fertility (too much or too little; moderate fertility is best). A slightly acid pH is conducive to decay, and in most instances is most likely to be achieved from frequent light applications of lime (in acidifying environments). Aeration is needed for decomposition to proceed at full pace, and is related to proper irrigation (avoid waterlogging or complete drying out). Smiley's thesis adds up to a recommendation for moderate maintenance for best control of thatch.

HEAT TOLERANCE OF TURFGRASSES

Wehner and Watschke, Pennsylvania, report in the Jan. Feb. Agronomy Journal, on the comparative heat tolerance of several Kentucky bluegrass and perennial ryegrass cultivars, and Poa annua. Initial injury began at 41° C. (about 106° F.), and kill occurred at temperatures above 47° C. (about 117° F.). Kentucky bluegrass was more heat tolerant than Poa annua and perennial ryegrass, ryegrass and Poa annua being similar. Bluegrass cultivars tested (A-34, Adelphi, Baron, Fylking, Galaxy, Glade, Majestic, Merion, Park, Pennstar, Newport, Ram I, Sydsport, Vantage, and eight experimentals) were all similar. Among the ryegrasses (Citation, Diplomat, Loretta, Pennfine), Loretta was the least heat tolerant. Of all grasses tested, Sydsport bluegrass rated highest, and Loretta ryegrass lowest for heat tolerance. There seemed to be no significant correlation between extractable carbohydrate reserves and heat tolerance. Tests were conducted by placing 10 week-old plants, maximized for heat tolerance according to conventional cultivation techniques, in sealed plastic bags for 30 minutes at the prescribed temperature, before replanting.

MYCORRHIZAE

What with ecological interplay of fungi and soil microorganisms seeming so much more important than formerly realized, mycorrhizae (fungi beneficially infecting roots of higher plants) are receiving greater attention. Their usefulness in controlling root diseases is discussed by Schenk, in the March Plant Disease. Schenk has found that growth (and yields) of inoculated plants far exceeded non-inoculated ones. He notes that mycorrhizae have proven to adapt plants for better growth in infertile soil (because of increased uptake of immobilized nutrients, and greater permeation of soil volume), to enhance water transport, to decrease transplant injury, to help withstand high temperatures, to aid establishment in wastelands, and, of course, to reduce the effect of root-infecting pathogens.

RHODE ISLAND FUNGICIDE EVALUATIONS RELEASED

Jackson et al, Department of Pathology, University of Rhode Island, sent their 1980 "Evaluations" during April. Unirrigated turf was not very instructive during 1980, because of the overriding effects of drought. Where watering was provided, pythium was often severe, and the usual infestations of brown patch, fusarium and anthracnose were experienced. A first-time invasion of southern blight (Sclerotium rolfsii) was noted, on Kentucky bluegrass in August.

Control of dollarspot and brown patch on bentgrasses was effective with most fungicides used, but was especially good with RP26019 (Rhodia). RP26019 was effective on both diseases, while many of the fungicides that controlled dollarspot were not very effective on brown patch. Kromad and Tersan 1991 showed weakness in dollarspot control at the peak of disease incidence. Combining fungicides, or alternating systemic with contact applications, is recommended to avoid build-up of disease resistance.

The Rhode Island disease control recommendations for 1981 offer a 4-page list alphabetical by common name of the disease, designating turfgrass hosts, fungicides that may be useful, rates, and proper spray schedule or comments. This is helpful to have, but as is typical with controlling diseases with fungicides, would probably be beyond the capability of a homeowner (frequent 7-10 day applications, often over a period of months). For leafspot and melting out of Kentucky bluegrass, use of improved cultivars is recommended (as well as avoiding close mowing and excessive nitrogen).

MOWING EFFECTS ON TURFGRASS

Biran and Bushkin-Harav, Isreal, report on turfgrass defoliation in the February HortScience. Two cool season species were utilized ('Pennfine' perennial ryegrass, and 'Alta' tall fescue) as well as 6 genera of warm season grasses. Experiments were conducted under warm conditions, which may account for failure of the cool season grasses to recover from complete defoliation (so, also, was the case with centipedegrass). However, in general the experimenters found that most lawn cultivars could be almost completely defoliated (removal of 75-80% of the chlorophyll), yet recover well. Shade tolerant species had more of the chlorophyll in the lower portion of the foliage canopy than did the shade intolerant species, and consequently would be more tolerant of delayed or infrequent mowing. As noted, complete or near complete defoliation resulted in death or near-death with centipede, ryegrass and tall fescues; two zoysias and st. augustinegrass showed a slow recovery rate; two bermudagrasses, kikuyugrass and Paspalum vaginatum were quite quick to recover.

RUST ON BLUEGRASS

Shearman et al report on Kentucky bluegrass cultivars and blends susceptibility to stem rust, in the April Plant Disease. Sixty cultivars and 24 blends established in 1976 were observed. Stem rust (Puccinia graminis) on blends generally paralleled the sum of incidence on individual cultivars. A number of common type grasses were highly resistant to stem rust, including Park and South Dakota common. In the same statistical grouping were Adelphi, Bonnieblue, Nugget, Sydsport, Glade, and Majestic. Touchdown, Birka and Plush were intermediate, Merion poor, and Vantage with the poorest rating of all.

REVIEW OF TALL FESCUE SOD PRODUCTION

The May issue of Weeds, Trees and Turf presents a review by Carrow et al, Kansas, on "Netting Tall Fescue Team-Up to Produce 9-month Sod". Included is a bibliography of 5 titles, three of them from the Third International Turfgrass Conference Proceedings, that help round out the scientific data presented. The gist of the story is that by using plastic netting for tall fescue (a bunchgrass), that an autumn seeding is ready for sod harvest in spring, or a spring seeding in autumn. Carrow has experimented with Vexar garden utility net made by Dupont with favorable outcome. As would be anticipated, tensile strength of the sod is remarkably increased where plastic netting is used, even with rhizoming grasses such as Kentucky bluegrass.

MORE ON NITROGEN FERTILIZER

Hummel, Penn State, reviews nitrogen sources for turfgrass in the May/June American Lawn Applicator. He discusses the familiar basic considerations (such as WIN and solubility features), and compares four different scenarios (water soluble, UF, IBDU, and SCU). Of these different types, only the SCU (sulphur coated urea) provided the requisite greenness throughout the growing season, and was considered the most valuable type even though officially it is composed of soluble nutrients (no WIN). He found that SCU, "- - - produced good color after fertilization and had sufficient residual nitrogen to maintain good color throughout the year. - - - Of all the fertilizers we evaluated SCU was the most versatile. - - - will produce excellent results under most fertilization schemes". Even so, Hummel recommends more than one application during the year in order to maintain good quality turf consistently.

ST. AUGUSTINE BREEDING PROGRESS

Reinert et al, Florida, report in the May-June Crop Science on efforts to breed an improved st. augustine turfgrass for the deep South. Floratam is a polyploid/aneuploid not very amenable to the incorporation of other genotypes. It is a rather coarse cultivar, but is prized for resistance to chinchbug, and to SAD-virus disease, scourges of st. augustine in the South. The researchers have successfully created mutants of Floratam through radiation, most of which retain the disease and insect resistance of the cultivar. Fourteen mutant types are being compared with the parent cultivar, and with common st. augustine.

WESTERN DISEASE NOW IN EAST

Dernoeden and O'Neill, Maryland, reported in April the discovery of Ophiobolus patch (caused by Gaeumannomyces graminis avenae). A bentgrass turf had been infected, and constitutes the first report of the disease in the mid-Atlantic states (the second report in the eastern United States). The announcement was carried in the June Plant Disease.

URBAN "GARDENING" REVIEWED

Gayle Worf, Wisconsin, discusses the increasing concern with urban surroundings in the June Plant Disease ("Does Urban Plant Pathology Have a Future?"). Worf finds more and more professionals devoting their attention to urban plant problems, with greater and greater expectations of help by people living in that environment. Trees are particularly a concern, but Worf notes that over 10 billion dollars was spent in maintaining lawns and turf in 1979. It is projected that over \$5 billion will be spent for professional lawn care services within the decade. Dr. Worf concludes, "We are a nation of urban citizens. We have an urgent need to make the environment where we work and live and play as attractive and healthy as we can. Challenging opportunities lie ahead!".