

## BETTER LAWN -- HARVESTS

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991 West Fifth Street  
Marysville, Ohio 43040  
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INDEX:	General Pages	51 - 5
	Technical Pages	6 - 24

### CHANGES AT STAFF OFFICE

Diana Scheiderer, for many years office manager and typist at Institute Staff Office, resigned to accept a position with O. M. Scott & Sons.

For personal reasons, Mrs. Scheiderer found it necessary to seek greater income than it was possible to provide under Institute auspices. We wish Diana a most successful career in her new endeavor.

The Institute was fortunate to have another Mrs. Scheiderer, Janet (no kin), to pinchhit for Diana during September. Thus, it has proven possible to keep basic activities in gear during the autumn season during which much routine activity and inquiry takes place.

Beginning with October, Mrs. Joyce Wening will handle office duties, a name break with the "Scheiderer sequence" but not with the activities so loyally carried out by Diana and Janet.

### VARIETY REVIEW BOARD ACTIVE

Dr. Gerald Pepin, International Seeds, chairman of the Institute's Variety Review Board, has been busy in recent weeks with the VRB activities. In addition to discussions concerning withdrawal of certain older varieties, applications have come in for inclusion of worthwhile new candidates, plus a proposal to institute a flower-lawnseed mixture as a special purpose planting (such as for roadside berms and "waste" land needing protection and beautification).

### PLANS FOR SPRING "JOINT SUPPLEMENT" CLEARED

The Lawn Institute Board, at its annual meeting in the summer, voted to participate again in the "Supplement", jointly sponsored by several national associations and produced by Pflaum Associates. The Institute has for years prepared the text and arranged the illustrations relating to turfgrass. Unfortunately, at the Annual Meeting of the Lawn and Turf-grass Division of ASTA, which has customarily shared expenses with the



#### PLANS FOR SPRING "JOINT SUPPLEMENT" CLEARED - Continued

Institute on this program, the matter missed the agenda and was not voted upon. But fortunately, through the good offices of Bob Falasca of ASTA, and the willingness of President Hovde and other officers to seek special approval, the project has been authorized to continue for another year and should yield an effective 1982 spring release to newspapers, house organs, and other publications. Excellent success has been had from this venture in the past.

#### ASSOCIATED PRESS PICK-UP FROM PRESS KIT

Outstanding publicity resulted from usage by Earl Aronson, AP Newsfeatures, in his syndicated column The Weeders Guide of Institute materials. Earl devoted an entire column to the Institute's autumn release used on various days in early September around the country, Sept. 8 by the Marysville Journal-Tribune and Sunday Sept. 13 by the Columbus, Ohio Dispatch.

The column opens, "A reminder that fall's cooling days are good for planting or improving bluegrass, perennial ryegrass and fescue lawns -- our lawn expert, Dr. Robert W. Schery of the Lawn Institute notes: --", whereupon follows excerpts from the press kit on planting and renovating lawns in autumn. The column offers informational leaflets on "weed-free seed" to those sending in a stamped envelope to the Marysville staff office. Requests have come from coast to coast.

#### INSTITUTE STORY APPEARS

The July/August issue of Turf News, journal of the American Sod Producers' Association, carried the Institute's story "Basics Behind Topflight Sod-grass". The item has been reprinted and distributed to the membership for use as a mailing stuffer and handout.

The item opens with discussion of "urban ecology", noting how well modern lawns and their care have evolved to fit a need. Several species of grass are backbone for this accomplishment. Kentucky bluegrass, perennial ryegrass, fine fescue and tall fescue are reviewed individually. Perennial ryegrasses are pictured in one illustration, the tough sod of Kentucky bluegrass in another.

The latter part of the story discusses the breeding of cultivars, with a boxed insert listing Variety Review Board acceptances. A few paragraphs wind up the presentation, discussing the basic growing requirements of such cultivars. A map depicting the different lawn regions of the contiguous United States helps embellish the final page.

#### STORY FOR INTERNATIONAL JOURNAL

Dr. Peter Boeker, West Germany, editor of Rasen, had asked Dr. Schery to prepare something for his international turfgrass journal when the two conversed at the 4th International Turfgrass Conference in Guelph, Canada. Opportunity finally permitted recasting of familiar North America material as an article entitled "Lawn Seasonal Scenario" in which it was felt that audiences in various countries might appreciate the highlights of lawn activities as they are encountered in the United States on a seasonal basis.

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#### STORY FOR INTERNATIONAL JOURNAL - Continued

Seeding, reviving lawns, fertilization, weeding, mowing, and pest control are some of the specific headings briefly discussed. Included is a table listing "New Lawn Cultivars", as represented by the Lawn Institute's variety review board acceptances (species' characterization is followed by a thumb-nail sketch of each individual cultivar).

#### INSTITUTE VRB CITED

The September newsletter, Greener Gardening Easier, published by E. Dexter Davis of Massachusetts, generously credited the Institute and its Variety Review Board in front-page copy. Printed there: "The Variety Review Board of the Lawn Institute reports the following grasses are outstanding under many conditions. Mixtures that include several of them will provide better lawns at lower expense." Thereupon all of the VRB cultivars are listed alphabetically by species, according to information provided in reprints and press kits.

We are pleased that this issue of Greener Gardening Easier devoted seasonal attention to lawns. A major portion of the first and second pages involved lawns and their care, while the insert page (pages two and three) constituted a "personal lawn chart" giving a calendar of things-to-do, and (on the back) an explanation of the activities advocated in the calendar.

#### LAWN STORY PLANNED

Judy Powell, publications director for the American Horticulture Society, has requested a lawn story with an "how to" approach for the American Horticulturist for sometime in the future. While it is questionable that sufficient information can be given in a magazine length article detailing all that the editorial committee wants covered, we'll "give it a try" just as soon as press kit obligations are out of the way at the staff office.

#### AUGUST SEED WORLD

The August issue of Seed World not only carried a fine biography of Secretary-Treasurer Russell, newly elected President of the American Seed Trade Association, but also announcement of Norman Rothwell's election to Presidency of the Lawn Institute. In the "Association News" column, a complete listing of the officers and newly elected trustees of the Institute, with their firms, is given.

#### NOTE IN GROUNDS MAINTENANCE

The September Grounds Maintenance magazine carried a news note about the Lawn Institute's annual meeting and election of officers.

#### GOLF COURSE MANAGEMENT ANNOUNCES

The September issue of Golf Course Management Magazine carried the Institute announcement of the annual meeting, and election of President Rothwell, other officers and new Board members.



#### LAWN CARE INDUSTRY REVIEWS GRASS SEED

The September issue of Lawn Care Industry, in a front page story by Bob Earley, editor/publisher, reviewed the current supply situation of Lawnseed. Earley was especially "high" on the future for fine-textured tall fescues. He states, "Tall fescues are the coming thing in grass seed." Earley had interviewed leading seed producers in the Pacific Northwest, many of whom have their picture appearing in this issue. We're pleased that so many staunch Institute supporters are quoted as authorities. In general, the tone of the article suggests that seed supplies will not be as abundant as once predicted (diverse factors have lowered yields somewhat), but that there will be a sufficiency of almost everything to meet demand, with perhaps domestic fine fescues being in shortest supply. Earley expects competition to keep prices reasonable.

#### "AUTUMN JAMBOREE IN LAWNLAND" POSTPONED

A story under the above title was scheduled in Landscaping, Lawn & Garden magazine for autumn publication. We're sorry to note that delays in getting the issue out well beyond its normal publication date made it impractical to include the story with its emphasis on seeding and improving lawns in late summer-early autumn.

#### WORD FROM MEN'S GARDEN CLUBS OF AMERICA

A letter from editor Bob Fischer states, "Keep your releases coming -- in the next issue we're running a group of your releases headed 'From the Lawn Institute'". We're delighted to have these items appear in the national publication, The Gardner, official journal of the Men's Garden Clubs of America.

#### REPRINT REQUESTED

Several members have taken advantage of the availability of the reprint from Turf News ("Basics Behind Topflight Sodgrasses"), for company distribution. We are pleased with this opportunity for passing on information, and publicity concerning the Variety Review Board selections.

#### A REQUEST FROM KANSAS STATE UNIVERSITY

A request from Dr. Robert Carrow, Kansas State University, Manhattan Kansas, resulted in the sending to him of a pound each of eleven cultivars from the Marysville stockpile. Dr. Carrow was notified that this was not "new" seed, but had been kept dry and should provide adequate germination. Expansion of test plantings is underway at Kansas State.

#### AGRONOMY MEETINGS TO FEATURE TURFGRASS TOUR

A day devoted to touring turfgrass research facilities will be part of a scheduled program when the Agronomy Meetings to be held in Atlanta November 29-December 3. Dr. B. J. Johnson is in charge of arrangements, and promises an interesting series of stops. Georgia is sufficiently South that such a tour will prove feasible even if the season is late (the idea was abandoned last year, for example, when the meetings were held in Detroit).



#### WEED SYMPOSIUM SCHEDULED

A "Symposium on Turfgrass Weeds - 1981" is scheduled for Columbus, Ohio, October 14-15. This is follow-up on a similar symposium on insects held last year, sponsored primarily by ChemLawn Corporation. Recognized authorities on weed control from both South and North are among the invited speakers.

#### LOOKING BACK ON THE SEASON

Every year is an "unusual" one, different in some ways. Grass plantings on the Institute grounds experienced dry weather in early spring (when this is not critical because of ample soil moisture accumulated through winter). By April-May-June one of the most consistently wet intervals in memory occurred (some rain almost every day, the soil continuously waterlogged for weeks). Then towards late June the rains stopped, and an absolute drought ensued for the next several weeks. This was traumatic for plants shallowly rooted because of the early plethora of moisture. Although a fair rain fell in early August, rather little was had in late August and through September. During blistering-hot weather late in August no rain at all fell, and vegetation generally turned sere.

Tall fescues were seemingly not bothered by these weather extremes, apparently being deeply enough rooted to garner moisture and remain green even during the driest weather. Surprisingly, the new turf-type ryegrasses held their color well most of the time, a bit better than did Kentucky bluegrass. Suffering most of all were fine fescues and bentgrasses. These observations are based on unirrigated turf.

#### WINTERSEEDING FEATURED

The September issue of Weeds, Trees & Turf magazine featured a discussion of research done at Mississippi State University on winterseeding of golf greens. Rather than small test plots, an entire half green was given over to a particular seeding mixture, and was replicated with a second planting elsewhere. The golf greens were in play, so that this investigation represents realistic conditions of use. The authors (Krans & Skoggins) note that the new turf-type perennial ryegrasses have come to dominate overseeding of golf greens, with annual ryegrass rather little used anymore. Poa trivialis, fine fescues and other northern species amplify the perennial ryegrass, helping provide extra shoot density and late-season quality at spring transition.

The evaluations extended over a five year period, 1976-80. Seeding rates were those recommended by the company offering the mixture, and generally ran about 40 lbs per thousand square feet (sometimes only half this when Poa trivialis and fine fescue were prominent in the mixture). The entries were listed according to their trade designation rather than by the names of the cultivars contained. All combinations tested well, with performance ratings in the 6-7 range (in which 9 was the best possible score and 1 the poorest). Differences between entries were not statistically significant, and golfers using the greens seemed unaware of boundaries when traversing plantings. The article makes a strong case for turf-type perennial ryegrasses for winterseeding.



## TECHNICAL SECTION

### INTERNATIONAL TURFGRASS CONFERENCE

July 19-23 the Fourth International Turfgrass Society Research conference was held at the University of Guelph, in Canada, preceded by tours in eastern Canada and the United States. President Switzer directed a beautifully organized agenda, with technical presentations and social functions mostly in a university hall. Proceedings of the conference had been gathered and published before the conference, a copy made available to registrants before the papers were formally presented. The Fifth Conference is scheduled for France. P. Mansat, Lusignan, France, was elected President for the on-coming four years.

An innovation for this conference was a keynote invited presentation opening each half-day session, preceding the briefer presented papers. C. Reed Funk, USA, opened session one with an overview entitled "Perspectives in Turfgrass Breeding and Evaluation". A series of papers followed relating generally to that theme. It is not possible here to more than mention a few highlights, and those interested in fuller information are referred to the Proceedings. For the benefit of the worldwide audience, Funk discussed strengths and weaknesses in turfgrasses, generally familiar to research followers in the United States. He emphasized increasing concern in selecting for pest resistance, and commented that Pennant perennial ryegrass has shown good resistance to sod webworm. Meyer zoysia has exhibited resistance to atrazine. In Ireland, Causeway perennial ryegrass has proved resistant to paraquat. Merlin fine fescue not only possesses drought tolerance and withstands low nutrient levels, but endures high levels of lead and zinc. A relatively new technique for securing innovations is to take isolates from aging tissue culture, which yields a great many variants that can possibly be perpetuated by apomixis.

Smiley et al discussed fusarium blight with relationship to origin of Kentucky bluegrass. Most parameters are of little value in predicting susceptibility to disease. In general cultivars from regions having high summer temperature tend to be least susceptible. Nilsson and Weibull, Sweden, investigating Fusarium snowmold on creeping bentgrass, considered that recurrent mass selections provide an improved degree of resistance to the disease.

Krans, Mississippi, has been successful in regenerating numerous grass species from callus induction. Tolerance of bermudagrass cultivars to various metals was studied in California. In Ireland Chewings fescue and bentgrass was selected for tolerance to aminotriazole, in amounts sufficient to kill Poa annua and Holcus in mixed stands of the grasses. In Wales salt-tolerant ecotypes of red fescue and perennial ryegrass have been examined, and the relationship of salt tolerance to cultivar breeding was discussed. Resistance to wear and compaction was studied in France, as was the suitability of grass species for horse race tracks (perennial ryegrass, fescue, bluegrass, and a bit of Phleum in mixture is currently recommended).

In Florida Barry, Dasher, Fiesta, and Pennfine perennial ryegrasses provided superior turf quality for winter overseeding, while Regal showed the best tolerance to wear from simulated golf traffic. No difference was found among cultivars in spring transition. In Texas perennial ryegrass was the most consistent species for winter seeding dormant bermudagrass, with Barry, Caravelle, Citation, Delray, Derby, Diplomat, Loretta, and Regal listed as the top eight performers. In polystands a mixture of 80% ryegrass, and 20% Poa trivialis was superior.



## INTERNATIONAL TURFGRASS CONFERENCE - Continued

Roy Goss, USA, delivered the keynote for the second session, reviewing the various management practices customarily accorded turfgrasses. Colorado research investigated how buffalograss is best handled, a reaction to present clamor about conventional turfgrasses utilizing too much water in dryland regions. Dr. Butler, at least, has no great enthusiasm for buffalograss ( a warm-season species) in comparison to bluegrass. As might be expected, best coverage with buffalograss was a May seeding, rather than later ones. Light-rate seedings eventually resulted in as adequate coverage as did heavier ones.

Yeam, Korea, working with Portz and Murray in the United States, continued to advance the cause of seeded zoysiagrass. "Scarification" with potassium or sodium hydroxide is deemed essential for a high level of quick sprouting, and plantings are best treated with a herbicide such as siduron in order to allow rather slow zoysia seedling growth better opportunity. Scarified seed, provided light, achieved around 90% germination within a week.

Eggens, Canada, found Poa annua more competitive against Adelphi, Nugget and Sydsport bluegrass when unmowed (greenhouse tests). Mowing reduced the shoot and root weight of all grasses, but Sydsport was least affected. Other presentations dealt with topdressing of golf greens, growing of turfgrass on a pine bark medium (France), wear comparisons (England) measuring sportsturf quality (France), and a review of test plot methodology (Florida). A few of the papers given this session were not prepared in sufficient time to appear in the Proceedings.

The third session, on Soils Irrigation and Nutrition, was keynoted by Adams, of the United Kingdom.

W. A. Adams is particularly interested in synthesized soils for athletic systems, involving laboratory analysis of physical qualities or intensive use. Sand, of course, is an important component of synthesized rootzone mixtures, with drainage and nutritional problems influencing not only the botanical composition of the turf but its ability to endure punishment. The subsequent papers in this session are more likely of interest to those with physiological leanings than cultivar interest, and involve various modes for measuring carbon dioxide, moisture, and other aspects of the soil "atmosphere" under varying conditions.

Blake et al, Minnesota, contributed a practical overview concerned with large scale field construction, noting the many things that are often not done well (such as thorough mixing of the components, and following of specifications). California research relating to water usage showed weed populations and turf quality to relate to irrigation treatment, but neither salinity levels nor rooting depth to differ among treatments. Bluegrass suffered reduction of density and increased fusarium under restricted watering. With almost all grasses weeds were more frequent at higher moisture levels. Ohio research suggests that silica has no important role in fertilization programs, and Kurtz (California) used radioactive iron as an aid in differentiating between iron-efficient and iron-inefficient zoysiagrass introductions.

Other papers deal with fertilization, including one by Christians et al comparing the efficiency of spreaders. Fertilization of tall fescue in the southeastern United States showed white clover to invade in low cut turf receiving minimal fertilization, while crabgrass was abundant where summer fertilization was frequent. Missouri researchers found an autumn-spring schedule of fertilization good for bluegrass, but had difficulty maintaining high quality Kentucky bluegrass for more than five years in that climatic belt (especially when close-mowed).



## INTERNATIONAL TURFGRASS CONFERENCE - Continued

In Florida, turfgrass grown on sandy soil had best quality, coupled with minimal nitrogen when slow release nitrogen sources were used. Behavior of differing sources followed the now well-recognized patterns, such as deficiencies from UF in cold weather. Connecticut research was concerned with maintaining Poa annua through summer, in which small increments of nitrogen fortified with some phosphorus gave improved density and survival. Research at Virginia and Ohio revealed often complicated interrelationships among nutrients.

Turgeon, Texas, keynoted section 4 on Plant Protection. Introduction was of a general nature reviewing weeds, diseases, adaptation; and various practices or handling problems that arise. He feels that breeding for tolerance to specific pesticides, herbicides in particular, is a very promising approach. He also looks with favor upon development of controlled-release formulations of pesticides.

Johnson, Georgia, found DCPA and MSMA effective in controlling crabgrass. Goosegrass control is generally better when metribuzin (at light rates) is combined with MSMA. In Michigan only Bensun and Nugget Kentucky bluegrasses retained resistance to leafspot under low light intensity, but Fylking, Merion and Galaxy (among others) were equally resistant in the sun. Glade was not in the test. Maryland researchers found a negative correlation between polyphenol concentrations in Kentucky bluegrass and incidence of Helminthosporium leafspot. A number of other technical presentations dealt with disease and insect problems and their treatment.

The complexities and uncertainties in dealing with pathological problems are apparent to anyone who has followed the field. An ad-hoc "Seminar" of an evening, called particularly by Vargas of Michigan State, engendered some revealing discussion. The general tone was that identification of diseases and their causes is in a state of turmoil. Many of the so called diseases may not even involve the fungus for which they are named (e.g. Fusarium, Sclerotinia dollarspot, etc.). A new ecological approach seems to be shaping up, rather than simply noting a disease and treating with a particular fungicide. Rather the emphasis is on interplay of organisms, examination of inter-affecting factors that cause "stress", relief from disease by a variety of means that may or may not include fungicides. Apparently many of the field observations do no jibe, in fact may be contradictory with those observed in the laboratory or growth chamber. It has been impossible to reinfect living turf with any of the so-called diseases isolated, a violation of the Koch principle.

Section five was keynoted by Beard, Texas, who offered mainly a literature review. Use of growth regulators was referred to in some of the papers; they were generally not recommended with enthusiasm, all things considered. The influence of light intensity on fescue tillering was examined by Smalley, New York, in which after 25 weeks the average tiller number of Biljart was slightly higher than Wintergreen-Jamestown, Ruby, Pennlawn. Total plant weight was highest under natural light supplemented with artificial light. Response of St. Augustine cultivars to shading was examined in Florida. Studying Merion and Baron bluegrass in Rhode Island with radioactive tracers, Hull found that photosynthate from leaves to stem was more rapid in the morning than in the afternoon, but translocation to the roots usually greatest afternoon. Translocation from leaves to stem was most rapid in heavily fertilized grass, with roots receiving more energy where low fertility prevailed. Fertility influences were most apparent during summer. Karnok and Augustin found that under low light conditions Glade bluegrass showed a more favorable carbon balance than did Merion, which may be



## INTERNATIONAL TURFGRASS CONFERENCE - Continued

a factor enabling it to exhibit superior shade adaptation. DiPaola et al showed that gibberellins had significant influence on counteracting chill damage to certain bermudagrasses.

The Proceedings of the conference winds up with abstracts given for 9 different "oral presentations", on a variety of subjects. Additionally there are nine "poster sessions" epitomized. One such involved trials in Virginia with mixtures of Kentucky bluegrasses and perennial ryegrasses. The 2 species persisted in the mixtures for the length of the experiment when adequately fertilized with nitrogen, and provided high quality turf.

## GUELPH TURFGRASS RESEARCH

On the occasion of the Fourth International Turfgrass Conference one afternoon was spent inspecting the turfgrass research grounds maintained by several departments of the University of Guelph, Ontario, Canada, Agricultural College. An overview may prove of interest:

Typhula and Fusarium snowmolds were readily contained by a large number of fungicides, most achieving nearly 100% control. Scott's triademefon and quintozone, Bayleton (triademefon) and Rovral (iprodione) all provided 100% prevention. Fungicidal results were not so dramatic in preventing dollarspot and leafspot, although an interesting sidelight showed CGA-64251 selectively eliminating bentgrass out of bluegrass to a large degree.

Several bluegrasses and fine fescues were examined for resistance to chinchbug invasion. Fescues were more damaged than bluegrass. Jamestown fescue had the highest number of chinchbugs per unit area, but showed less damage than either Boreal (the most severely stricken) or Highlight. Bluegrasses were only slightly afflicted, and differences between cultivars inconsequential. The tests were conducted on plantings adjacent to a wooded area known to harbor chinchbugs, a source for natural invasion.

All insecticides tested (chlordan, chlorpyrifos, carbaryl, cypermethrin, isofenphos) were quite effective in controlling black cutworm larvae in bentgrass.

Slow-release nitrogen sources have been tested on bentgrass, over a four year period. Sulphur coated urea and methylene ureas, six applications per season, provided high quality turf. IBDU showed slow response in the coolness of spring, while UF and CDU required prolonged use before sufficient residual was built up. Surprisingly, it is thought that six applications of these materials are needed rather than three, which would seem defeating of the slow-release purpose.

Generous potassium fertilization in autumn offered no advantage, but early spring green up and density were strongly linked to nitrogen applications in "winterizer" tests. The official position is a generous slow-release nitrogen application after the last mowing in autumn. Testing for the influence of nitrogen and potassium on wear of Penncross bentgrass, potassium exerted little influence, but nitrogen increased yield, greenness, thatch, root production, clipping yields, annual bluegrass content; winter injury, dollarspot disease and drought tolerance decreased.



## INTERNATIONAL TURFGRASS CONFERENCE - Continued

Embark growth retardant was helpful in restraining annual bluegrass overseeded with Sydsport bluegrass, Manhattan perennial ryegrass, Jamestown fescue, etc. The overseeded grasses established more fully when Embark was used. In other plantings in which cultivars were mixed with annual bluegrass, Sabre poa trivialis, Pennfine perennial ryegrass and Penncross creeping bentgrass all proved very competitive. Sydsport, Nugget and Plush competed moderately well after a year, Adelphi and Fylking poorly.

In shade studies, Touchdown and Nugget showed better growth under heavy shade than other Kentucky bluegrass cultivars; Argyle, Plush and Merion were least satisfactory. Pennlawn and Fortress did well under heavy shade, Banner under medium shade.

In wear tests, Kentucky bluegrasses proved almost as durable as perennial ryegrass cultivars, but red fescues did not stand up well. Among the fine fescues Banner was the most wear tolerant, Highlight the least. Bentgrass and poa trivialis were the least tolerant of the species tested.

In bluegrass evaluations, seeded 1977, Glade had a significantly higher average rating than any other cultivar, followed by Plush and Adelphi; Merion was least satisfactory. Among perennial ryegrasses Pennfine was out front, with Manhattan, Omega and Blazer tied for second. With fine fescues Koket led, with Jamestown second among named cultivars.

In 1978 seeding of the limited number of cultivars, Sydsport was the top rated bluegrass, Derby the top rated perennial ryegrass, while Loretta took honors in a 1979 seeding.

A more comprehensive Kentucky bluegrass planting from 1979 showed Cello to score most highly, followed closely by Birka, Haga and Touchdown tied for second.

In a table of miscellaneous comparisons, Prominent bentgrass was the leader, followed closely by Seaside and Beaumont meadow fescue.

## OHIO TURFGRASS FIELD DAY

The annual field day, Ohio State University Turfgrass Research Facility, Columbus, was held on Tuesday, August 4. Eight stops, followed by a luncheon, and afternoon workshops (emphasizing weed identification) were included this year. In general growing conditions had been quite good (irrigation is practiced if needed); very little disease was to be seen, almost all comparisons looking excellent, there was little to choose between alternatives. Conclusions are therefore more based upon comments of the discussant (who observed the plantings through the year), and articles in the "Field Day Program".

Stop 1 - Comparison of slow-release forms of nitrogen fertilizer on Kentucky bluegrass. Through the year fertilized plots were superior to those not fertilized. Several, including UF and milorganite showed slow initial response in early spring, and lower quality in cooler weather. During summer check plots were about as good as the fertilized ones, indicating a reserve of soil nitrogen at the test site. Ratings are not averaged for the year in the program tables, but individual fertilizers can be compared for all seasons, at both low and high rates, either according to quality ratings or clippings yield. Almost all products provided adequate turf quality most of the time.



## OHIO TURFGRASS FIELD DAY - Continued

Stop 2 - Bluegrass cultivars compared at three rates of nitrogen fertilization (2, 4 and 6 pounds annually). Very few plots exhibited noticeable differences. A bit more weediness was noted at the low fertility rate, a bit more invasion by volunteer bentgrass at the high fertility rate (perhaps indicating that the middle 4-pound rate was preferable?). The rating tables showed only limited statistical difference between cultivars (with 21 entries, for example, being in the top statistical bracket at the 2 pound rate, and thirty being grouped in the second bracket of the 4 pound rate). In average ratings the coded selection (I528T: Turf-seed) was either first or second at all fertility levels, conspicuously highest at medium and high fertility. Majestic, Columbia and Parade showed high quality at the lowest fertility; but A-20, Victa, Rugby, Vantage and Baron were among the poorest. At the highest fertility level, in addition to I528T (Turf-seed) leaders included Kimono, Glade, Aspen, Parade, Bonnieblue and Touchdown (Touchdown had performed poorly at low fertility). In 1980 a severe infestation of Sclerotinia dollarspot was experienced, with Nugget and Birka being most susceptible at all fertility levels. Several cultivars experienced no disease at all at high fertility, IS-154 none at any fertility level. Dandelion invasion was used to measure resistance to weed; greatest resistance generally occurred under the highest level of fertility (thus those cultivars "enjoying" high fertility were most responsive, led by Kimona and Sydsport among named selections, with Columbia, Parade, Merion, and Adelphi following).

Stop 3 - Enkamat and Grass Cel Paving Blocks were compared with natural soil, under sod, for wear resistance. A wear machine from Michigan was employed. The Ohio grass (Merion) was found to be as much as tenfold more wear-resistant than Michigan tests suggested. It is speculated that this was because the sod was thatchy. No advantage was apparent from plastic cell blocks or enkamat imbedded beneath sod, and in both cases usage complicated establishment of the sod (thus, they are perhaps, more applicable for seeded turf). With Grass Cel at about \$1.25 per square foot, and Enkamat about 55¢ a square foot, it is difficult to justify their usage except under very special conditions.

Stop 4 - Growth Regulators. Early experience with several growth regulators was not encouraging, and research had been restricted in 1981 to the only commercially available product, Embark. Embark provided growth reduction of a modest nature for Kentucky bluegrass, and of significant proportions for tall fescue, with only slight (and delayed) response for perennial ryegrass. Tall fescue was rather seriously discolored. Since many turfs are in mixtures, such differential response affords a serious limitation. On August 4, turf where growth had been restricted appeared unsatisfactory (its belmishes and weeds were decidedly more apparent); it is difficult to imagine anyone preferring such results in exchange for some savings in mowing.

Stop 5 - Fertilizer Burn. This exhibit was chiefly of interest to lawn service people applying liquid fertilizers. Foliage burn ratings were given for a wide range of products compared to urea. As would be expected, UF slurries are slow to respond until used in successive years (building up a residuum in the soil). Other combinations, such as formolene, were mainly of value in reducing burn. Numerous products are available less hazardous than liquid urea, but of course dry granular urea is not hazardous under normal conditions. A chart is given for clippings yield on a weekly basis, for 28 products.



## OHIO TURFGRASS FIELD DAY - Continued

Stop 6 - Broadleaf herbicides. An unfertilized area overrun with ground ivy (Glechoma) served as test area for broadleaf controls. A new product, Garlon (triclopyr), proved effective, but only after much delay (spring results from an autumn application). Surprisingly, both dicamba and MCPP had little effect on ground ivy, but 2,4-D gave complete control from a mid-September application.

Stop 7 - Influence of pesticides on earthworm population. Various pesticides were applied in narrow strips to typical bluegrass turf, the sod later lifted and earthworm castings noted as an indicator of earthworm populations. Earthworms are often instrumental in reduction of turfgrass thatch. Both diazinon and chlorpyrifos (Dursban) do little to disturb earthworm populations, but other fungicides and insecticides (including carbaryl, benomyl and DCPA) did.

Stop 8 - Rhizotron studies. Observations on growing grass root systems continues in the underground rhizotron. Comparing different turfgrass species tall fescue was found to root most deeply, most rapidly, followed closely by perennial ryegrass; with bluegrass next and bentgrass came next, with Poa annua least. Interestingly, when warm weather began Poa annua root growth ceased abruptly as seedheads formed (last week of March). This is perhaps why Poa annua "konks out" in hot weather. All species showed spring vigor, summer senescence, with root growth picking up again in autumn. It continued in deeper soil throughout winter (where perennial ryegrass and tall fescue enjoyed an advantage, since they were deeper rooting than other species). Sulphur applications improved Penncross bentgrass shoot density, but had no influence upon the root system; no response occurred with Poa annua.

## NEW JERSEY REPORTS

In late September we received from Dr. C. Reed Funk, a copy of the Rutgers Turfgrass Proceedings 1981. As has come to be expected, this book-size compilation (137 pages) contains many outstanding technical papers. The forepart is taken from lectures delivered to the New Jersey Turfgrass Expo by invited speakers, and the latter part consists of professional research evaluations by the Rutgers University Soils and Crops Department specialists.

Opening papers are by Jagschitz, Rhode Island, concerning weed control and turf weeds. Together his papers provide a concise, understandable review of the current art of weed management in turf. Jagschitz points out the usefulness of activated charcoal for reducing toxicity of herbicides. He lists the various soil sterilants today available, and reviews specialty weed controls (such as DCPA for Veronica filiformis). Benefin, bensulide, DCPA, oxadiazon and siduron are listed as the standard crabgrass (and for goosegrass oxadiazon especially) preventers. Common names for chemicals are given, with common sense observations about their usage. Engel, Rutgers winds up this thorough discussion on weed control with a history and updating on phenoxy herbicides. He notes that, "After more than 25 years of use, silvex and 2,4,5-T were suspended abruptly in 1979 for reasons many consider inadequate."

Goss, Washington, provides a nice summary of the usefulness of sulphur on bentgrass. In his research there is no question but that sulphur has been very helpful, as a nutrient, and especially for restraining disease and controlling Poa annua. Sulphur additions do lower the pH, - about a half unit over four or five years. This, however, is little more than the lowering caused by nitrogen (urea) alone when applied at a generous rate. In addition to improving turfgrass growth, sulphur has restrained algal growth and earthworms. Phosphorus applications can partially undo the effectiveness of sulphur in controlling Poa annua.



## NEW JERSEY REPORTS - Continued

Dest, Connecticut, investigates the usefulness of phosphorus for bentgrass. It becomes clear from his data that at least moderate phosphorus is essential for good growth and turfgrass quality. Zak, Massachusetts, investigated the influence of phosphate on growth of Poa annua and bentgrass. Here, too, phosphorus was essential for reasonable growth, and both species sought out phosphate-rich strata as exemplified by root abundance. He suggests that Poa annua could be discouraged with zero phosphate fertilization, if phosphate were placed in deeper layers for the benefit of bentgrass (which, once established, would derive it from deeper rooting).

Other invited papers had to do with aspects of golf course management and care of athletics fields. In the latter context Goss recommends for the humid Northwest stripping of native soil and an elaborate remaking with a sand mixture accompanied by a detailed planting and care program. Goss also notes fairly slow development of the sod industry in the humid Northwest because the climate is so conducive to establishment of turf from seed (such that the greater comparative expense of sod mitigates against its use). Sod growers prefer to utilize bluegrass, but in this humid region bluegrass will not last more than a very few years before giving way to bentgrass or a wealth of adventive species; Goss does not recommend it for permanent turf (fine fescue is more durable for shade). Twenty-two sizable sod farms are named for Washington-Idaho-Oregon, encompassing over five thousand acres.

The remaining 85 "green pages" detail research of the Rutgers staff, much of it involving cultivar development under the leadership of Dr. Funk. Fine fescues are briefly discussed, noting probable increase of interest because of their adaptation to water restrictions and low maintenance. The hard fescues (Festuca longifolia) have been particularly good performers in New Jersey, being attractive, dense and free from disease (Reliant, Waldina, Scaldis and Biljart have been outstanding). Chewing's fescues that have shown up well include Banner and Agram among VRB acceptances. Ensylva has performed well among creeping red fescues and is more useful for seed mixtures than the Chewing's types; unfortunately it suffers from dollarspot disease.

Contrary to expectations, certain pre-emergence herbicides for crabgrass (particularly bensulide and oxadiazon) worked as well or better this year applied as a spray than applied dry. DCPA still was slightly better as a dry material than as a spray. In general, recommended rates were rather "weak" for good control this year (and in "good" crabgrass years previously), suggesting that a rate increase of about 50% might prove useful. In general there was no advantage to two separate applications of a preventer compared to a single application at equivalent total rate (provided an effective type of product is being used).

Nematodes were thoroughly investigated in turf, with somewhat confusing conclusions (sometimes controlled by a pesticide, sometimes not; some predatory on others; some more abundant in thatched areas, some less so; etc.). It is obvious that nematodes infest bluegrass turf, and have some influence on grass growth (for example, perhaps delaying spring green-up?), but much remains to be learned of their ecological role.

An interesting update is made of the "Blend 38" planting (38 separate bluegrass cultivars mixed). For several years the blend behaved about as the average for the components separately, but in recent years has outperformed the average.



## NEW JERSEY REPORTS - Continued

Analysis of turf composition shows that it now consists of about 68% of Brunswick, 24% Touchdown, and only 8% all others. Thus the current performance is largely due to Brunswick supplemented by Touchdown. Both of these cultivars do well in New Jersey, which would account for the superior later performance by Blend 38.

Perennial ryegrass cultivars have been very much a concern at Rutgers. Many different plantings have been made at New Brunswick and Adelphia, ratings from which are reported. Affliction by various diseases is recorded, as are "performances" at various intervals during the growing season, with average scores given in these tables for 1978, 1979 and 1980. The three-year average for Adelphia shows Ranger and Blazer comfortably in the lead, with most VRB selections in a group immediately following. Many cultivars are cited individually by the researchers for good performance according to the criteria being observed (specific diseases, for example). Pennant, not a "world beater" in 1979, led one scoring for 1980 (the 1978 seeding at Adelphia); it was notable in 1980 for resistance to sod webworm attack. In another planting several coded selections outscored Pennant, as did Blazer, Fiesta, Yorktown II, and Elka as well as a few others. All in all the new turf-type perennial ryegrasses give a very creditable performance.

In other research some linkage of thatch with dollarspot disease seemed to occur, but this was not always clearcut and there were exceptions. One possibility is that thatch interferes with penetration and dispersal of fungicides that might control disease. In other cases, where a fungicide actually seems to encourage disease, it may be that the fungicide decimates organisms that are antagonistic to the disease? The new turf-type tall fescues such as Rebel and Falcon continue to give very encouraging performance in the trials at Adelphia. They rate well ahead of the familiar pasture selections.

Yellow tuft disease (due to Sclerophthora macrospora) afflicted a large stand of perennial ryegrass at Adelphia in the spring of 1980, following a fairly prolonged interval of flooding. Not a great deal of variability in resistance was noted among cultivars, so that selecting for resistance does not seem promising; however the disease is not common, and excessively wet conditions leading to its incitation are generally unlikely.

The Kentucky bluegrass cultivar comparisons are a feature of Rutgers reporting. For 1980 Eclipse led comfortably in the ratings, continuing its outstanding performances of 1979 and 1978. Well-known cultivars that rated well also included Vanessa, Mosa, Touchdown, Kimono, Birka, Plush, Majestic, Adelphi, Bono and Fylking. Common types generally rated poorly. In other tests America joined the select list, with Emmundi not far behind.

As windup to the publication, Funk, Engel and Duell provide a 20 page review of Kentucky bluegrass, discussing origin, adaptation, breeding, chief diseases and other habits. Capsule summaries are given for many of the more prominent cultivars in alphabetical sequence. Several tables list cultivars according to resistance to diseases, and according to habit of growth (Nugget, Eclipse, Glade and America are listed as the lowest growing cultivars, in which the proclivity for decumbent growth seems to extend through much of the summer as well). This summary of bluegrass provides an excellent overall characterization of the species and what can be expected from it under various turf situations even outside of New Jersey.



## MIDWEST TURFGRASS CONFERENCE

The April Harvests carried the Institute's presentations to the Midwest Regional Turfgrass Conference at Purdue University, March 2-4. In July the complete Proceedings was published. Members may find it of general interest:

The conference was dedicated to Bob and Inez Dunning, and a number of the opening papers were of historical nature, touching upon the contributions of the Dunnings and their contemporaries. The banquet speaker, J. P. Rossillon, emphasized impending crises in water usage. He predicted, that for the golf course, conditions may be worsening. Statements included "With lawns, 'plusher' may not necessarily be better. In relationship to golf courses, we may even have to consider 'poorer quality greens and better quality putters'." And, again, "When the energy crunch arrived, the automobile industry discovered that big cars were 'expendable', and industry had then to go to the Federal Government to be 'bailed out'. When the water crunch comes, green grass will be expendable.. Will you be ready? Or will you have to run to the Federal Government, too?"

Other papers of a general nature included an overall view of energy prospects, a birds-eye look at the turf care industry, and a very generalized overview of "old and new grasses" by Huffine, Oklahoma. Ferguson, Texas, discussed rootzones, and Watson sand (so ubiquitously used with golf courses). Daniel offered specifics about sands for rootzone, a research specialty at Purdue.

A number of discussions dealt with the still uncertain cause for demise of Toronto bentgrass in the Chicago area. In some cases the greens have been resodded with a different cultivar, the cost running in the neighborhood of \$2000 per green. Other papers deal with green construction, utilizing various techniques. A sand topdressing program was successful in Springfield.

Water supplies were focus for attention. In some cases water from wells and storage ponds was fairly saline, and sources showed imbalances that could damage turf. A consulting engineer discussed the modern proclivity for fast drainage instead of allowing water to run off slowly (better soaking into the ground), causing floods and damage.

Sartoretto discussed old and new fungicides. He warned about pests developing resistant strains even to the newer chemicals. He suggests tank mixes to help avoid the problem. Scott, Purdue, reviewed several of the newer fungicides only now becoming available. The advantages of liming and balanced nutrition are extolled by Bill Lyons.

Grau reviews the early years in launching zoysia. Frazier discussed changing fairways to bentgrass, utilizing such aids as glyphosate, and seeding as lightly as 5-7 lbs. per acre. An early September seeding is recommended. He has used a three-way blend of Penneagle, Penncross and Emerald. Fairways as far south as Cincinnati have been planted to zoysia, generally started from sprigs. MSMA can be used with the zoysia to control crabgrass and other annuals. Still, it takes three years before a solid zoysia stand can be achieved. One course in Minneapolis converted bluegrass fairways to Penneagle by overseeding. Another in Carmel used glyphosate in the conversion. Jordan, of Monsanto, summarized the characteristics of glyphosate (Round-Up).

Other courses have planted bluegrass to the fairways with success. One planting included a blend of America, Adelphi, Glade and Touchdown, sowed into ground freed from vegetation by glyphosate treatment.



#### MIDWEST TURFGRASS CONFERENCE - Continued

Several papers deal with the mechanics and business operations of golf courses. Others discuss government regulations, lawn services, etc. Lawn care service people recite a number of poignant cases affecting their operations and successful programs. Some select specific cultivars for particular usages, plant them as part of their service with a slit-seeder. A large arsenal of bluegrass cultivars is looked upon with favor. Other presentations deal with various aspects of landscaping. Purdue research on exposure to pesticides is reviewed in detail.

A section of athletic fields winds up the proceedings, some of it drawn from Bob Dunning's writings many years old. Toma, Kansas City, commends natural over artificial turf. Several presentations review conventional athletic field procedures.

#### ANNUAL TURFGRASS REVIEW

The July issue of Park Maintenance magazine carried its usual annual review of turfgrass research. A general overview taken from reports requested from the state colleges is presented. Little opportunity is afforded discussion of conclusions or details. Guest "editors" handle regional coverage for the magazine, this year Dr. William Johnston of Washington for the West; Dr. Gilbert Landry, Georgia, for the South; Dr. Peter Dernoeden, Maryland, for the East; and Dr. Nick Christians, Iowa, for the Midwest. In general the presentations are well written, devoid of the abundant misspellings and typographical errors that have plagued this particular magazine other years.

In the West, aside from the Mt. St. Helens eruption (the ash has not been so troublesome as might have been imagined), cultivar testing has continued in Idaho with good persistence of perennial ryegrasses. In Colorado attention has been centered on water saving, using buffalograss. Tall fescues, especially the new "turf-types", received increasing attention in a number of areas. In Washington sulphur (either alone or as a component of fertilizer compounds) continues to be found for turfgrasses; it also aids in disease control, and in reduction of Poa annua invasion.

A number of cultivars were listed as showing comparative chlorosis resistance in Colorado, including Adelphi and Sydsport. In Washington snowmold had evolved disease-resistant strains to the fungicide Chipco 26019. In Colorado the perennial ryegrasses proved least winter-hardy of conventional lawngrass species, and Kentucky bluegrass could lose hardiness if dormancy were broken by warmth (drought seemed to induce cold hardiness).

In the South the search goes on for improved cultivars. Radiation has yielded candidate st. augustine in Florida, and Tifway II has been released in Georgia as an improved variant of that well-known cultivar. A new st. augustinegrass, 'Raleigh', is being released from North Carolina by Dr. Gilbert, said to have excellent SAD resistance, cold hardiness, and good adaptability from Virginia to Texas. In Florida the search is on for minimal maintenance bahiagrasses for roadsides. In Texas tall fescue, mowed tall and fertilized about a quarter of a pound of nitrogen per thousand square feet per growing month, has performed very well as a shade grass. Many other channels of research, including weed control and integrated pest management, have been reviewed from time to time in Harvests as the research reports are issued.



## ANNUAL TURFGRASS REVIEW - Continued

In the East increasing concern is being shown about growing turfgrass under restrictions, - less water, less fertilizer, fewer pesticides, less energy input, etc. Research from Penn State indicates that liming benefits turf little, unless acidity is extreme or calcium limiting. Sulphur-coated urea provided the best season-long color and more uniform response among nitrogen nutrients. At Beltsville composted sewerage sludge supplied all the nutrients needed for a low-maintenance turfgrass (heavy metal content was not sufficient to injure the turf). At Penn State higher mowing and heavier seeding rates restricted annual bluegrass invasion. Kentucky bluegrass was said to be more heat-tolerant than perennial ryegrasses or annual bluegrass, with 'Sydsport' especially outstanding. At Beltsville the fine fescues were the most tolerant of soil acidity, but the following bluegrasses also ranked favorably: Fylking, Ram I, Plush and Emerald.

Potassium hydroxide plus light enhanced seed germination, perhaps important with zoysia but effective with Kentucky bluegrass, too. Studies at Rhode Island indicate that MCPA can generally substitute for 2,4-D, should restriction be imposed on the latter. In a USDA study, several pre-emergence herbicides reduced cold-tolerance of Tufcote bermudagrass. At Rhode Island it was shown that a species of *Aristida* inhibited red fescue establishment on roadsides, a case of strong allelopathy. Growth regulators were tested at many research centers, with mixed results: Growth suppression could be obtained, but there was often some degree of injury to the turfgrass. At Penn State treated grass withstood drought a bit better than untreated.

A number of new systemic fungicides have been commercialized and show promise. At Cornell it was shown that fusarium is generally less injurious to Kentucky bluegrass cultivars selected or bred in regions where summer temperatures are high. Dr. Funk noted that Vantage bluegrass showed good fusarium resistance when mowed tall (two inches), but susceptibility at lower mowing heights. Research at Cornell has shown that several of the fungicides which would seem to offer fusarium control in the field do not inhibit the fungus in the laboratory! The review lists perennial ryegrass cultivars which have shown good performance at Rutgers, and commends the new "turf-type" tall fescues as represented by Rebel and Falcon. Virginia has released a new bermudagrass cultivar, 'Vamont', said to be aggressive and having good winter hardiness.

Midwest research overlaps that of the East in many areas. Carefully controlled rates of linuron have been suggested at Minnesota, for control of *Poa annua* in Kentucky bluegrass. At Iowa it has been shown that phenoxy treatment stimulates the development of leafspot symptoms and leafspot relates to photoperiod. In Kansas fusarium blights often seemed to increase where fungicides were used (successfully) for leafspot control.

The breeding of fine fescues for leafspot resistance is nearing completion at Michigan State. The meadow fescue, 'Beaumont', has been released, assigned to Loft Seed Company. Buffalograss is being given a good looking over, both at Iowa and Nebraska, as is *Zoysia* at Southern Illinois University. Renewed emphasis is being placed upon autumn fertilization, with research conducted at several locations.

## REPORTS FROM KANSAS

Dr. Carrow, Kansas State, Horticulture, mailed a number of reports and publications to the Institute in July. One five-page fold-over discussed Fescue



## REPORTS FROM KANSAS - Continued

Turfgrasses. Fine fescues find limited usefulness in Kansas, but the tall fescues are widely used in this transition zone climate. Whereas almost none of the fine fescues score acceptable marks, a number of tall fescues now do. They are rated very good to good for drought tolerance, wet soils, wear, acid soils and alkaline soils. They rate at least fair to good in all other respects as well. In the Wichita area Rebel and Falcon led 1980 ratings (with Monaco and a coded selection not far behind), having held their leading positions in a 1979 averages as well. Falcon was not in the Manhattan plantings, which Rebel led in 1979, and was a close second to Clemfine in 1980.

Kentucky bluegrass is a favorite in Kansas, but the climate is marginal for it in some years. Cultivars have shown differing adaptabilities, and stress has been especially apparent in the Wichita area (Manhattan is a more favorable environment for bluegrass). Good performance was held by Majestic and Baron in the Wichita area; Sydsport, Baron, and Bonnieblue tended to thatch. At low mowing (1 inch) Adelphi, Fylking, Bonnieblue and Vantage also rated "acceptable". All of these cultivars were better when mowed taller (2 1/2 inches).

The Kentucky bluegrass cultivar comparisons at Manhattan for 1979, 2-inch mowing height, indicated Columbia, Haga, Rugby to be followed closely by Ram I, America, and Touchdown.

A four year average at the 1 inch height, and a five-year average at a 2-inch height, gave these readings: Adelphi, Ram I, Glade and Sydsport led the averages at 1 inch; at higher mowing the order was Ram I, Adelphi, Glade, Sydsport, Fylking and Touchdown, to name the major commercial cultivars. Seldom was any disease "severe", although Parade, Nugget and Aquila suffered moderate leafspot; Nugget, Touchdown, Majestic, Parade and Aquila a fair amount of fusarium; Rugby and Parade moderately severe stem rust. The authors note, "At this height (2 inches) outstanding performance is noted for Ram I, Adelphi, Glade and Sydsport.". And, though Touchdown was susceptible to some diseases, it recovered quickly.

Under low maintenance, at the 2 inch height, Arboretum, Park, Baron and Merion provided acceptable quality, while at the 1 inch height only Arboretum and Park were acceptable. In the 3 year averages, Arboretum led ratings both at the low and high cut, but as might be expected low maintenance did not provide as good quality as more lavish care. In 1977 Vantage, Touchdown, Enoble and Sydsport (as well as a couple of coded selections) suffered appreciable stem rust.

The authors summarize by concluding that under high maintenance, these cultivars rated very good at one or both locations: Adelphi, Baron, Fylking, Glade, Ram I, Sodco, Sydsport, and Touchdown. Under low maintenance acceptable cultivars were: Arboretum, Baron, Merion and Park.

Perennial ryegrass is not as generally useful in Kansas as tall fescues or bluegrass. It is mainly utilized for quick cover, and as a minor component in mixtures for early establishment. In tests in the Wichita area no cultivar was considered to provide "acceptable" quality in early tests, but at Manhattan Pennfine and Manhattan among others were acceptable. With more recent plantings, at a 1 inch mowing height at Manhattan, Citation and Diplomat proved outstanding, with Derby, Yorktown, Manhattan and Pennfine doing well, too. At the 2 inch height, Derby, Diplomat, and Yorktown were outstanding, with Manhattan and Pennfine very good.



#### VIRGINIA "TECH TURF TOPICS"

The July issue of VPISU "Tech Turf Topics" was received in early August. In addition to discussions of a familiar nature, it announced availability of athletic field demonstration plantings at Annandale (among cultivars planted were Midiron, Tufcote and Vamont bermudagrasses; Meyer zoysia; seeded and sodded bluegrasses; tall fescue; perennial ryegrasses).

Couch discusses successful use of two new systemic fungicides for control of pythium (Banol and Subdue), but advises alternating such systemics with a contact fungicide to avoid resistance build-up. Bingham notes the usefulness of tank mixes built around 2,4-D, Dicamba, Mecroprop and 2,4-DP being additive and requiring slightly less of the combination than would the ingredients separately. Rogers discusses paraquat, glyphosate and similar products briefly, mostly non-selective except as applied selectively. Oxyfluorsen (Goal) is a new herbicide useful for both premergence and early post-emergence weed control with conifers; it may be selective on other ornamentals, too, although currently is labeled only for broadleaf and grass weeds in conifers.

Chalmers discusses the art of golf course management, and Hall some of the decisions concerning nitrogen application to golf greens. He remarks about a current trend to lower nitrogen rates more than were recommended only a few years ago, which often have such advantages as less disease, lower costs, less thatch; but disadvantage such as slower healing, less ability to withstand heavy play, more weed invasion, and poorer color.

#### OHIO TURFGRASS RESEARCH NUGGETS

The "Research Update" was received in August from the Ohio Turfgrass Foundation. It epitomizes research carried on during 1980 and initiated in 1981. A few highlights from the many projects under way may be of interest:

Several fungicides were found to decrease micorhizal associations on turfgrass roots.

Coring and spiking did not seem to diminish effectiveness of most pre-emergence crabgrass preventers, although dethatching prior to application decreased effectiveness of everything except Ronstar.

At light fertilization rates, Ram I had significantly higher quality ratings than other cultivars. Under heavy feeding Ram I was joined by Baron, Columbia and Aspen for good season-long performance.

Sabre Poa trivialis was the best shade grass alone or when combined with perennial ryegrasses or Nugget and Glade bluegrasses. Merion showed poor shade tolerance.

Paramount, Diplomat and Elka were the most rapidly establishing perennial ryegrasses (Birdie, Citation and Yorktown II were the slowest), but after two months all cultivars covered equally well. NK-200 and Paramount were the only cultivars infected with rust.



#### OHIO TURFGRASS RESEARCH NUGGETS - continued

Mixtures of Kentucky bluegrass and perennial ryegrass, in differing percentages, were observed for six years. Regardless of the bluegrass cultivar or its percent in the mix, the stand became dominated by Kentucky bluegrass if common perennial ryegrass was used; but where a turf-type perennial ryegrasses (Manhattan was the specific test cultivar) as used the stand became predominantly perennial ryegrass. Apparently choice of cultivars is of more importance to final composition of stand than is percent in the initial seed mixture.

A number of other brief reports are included, some of which are discussed in coverage of the 1981 Field Day presented elsewhere in this issue of Harvests.

#### MISSOURI REPORTS

A "not for publication" report on turfgrass research from the University of Missouri indicates observations of particular interest in this climatic belt where East meets West and North meets South. The summer of 1980 was so harsh that readings had to discontinue, because even with irrigation it was impossible to restrain dormancy.

Several well known bluegrass cultivars performed capably through July in 1980, among them Glade, Mystic, Touchdown and several combinations. Recovery from summer stress was rather notable with Biljart and Ensylva fine fescues, and several perennial ryegrasses (including Delray, Fiesta, Derby, and Manhattan). Adelphi, Birka, Columbia and Kenblue were bluegrasses rating most highly for recovery.

Not a great deal of statistical difference showed up between tall fescue selections, although Rebel was disappointing in late season rating. Judged by yearly average at Columbia, Manhattan and Diplomat were the top two perennial ryegrasses rated for quality, but again by midsummer under difficult weather conditions ratings for all were rather low.

No bermudagrass rated better than Tifgreen (although two selections were tried with it) for quality. Considerable variation existed between the better and the poorer bermudagrasses rated for quality. A number of zoysia grasses seemed to "decline" for unknown cause, with Emerald least affected.

#### SUMMER "TEXT TURF TOPICS"

The Virginia Polytechnic Institute Newsletter, dated June, was received in mid-July. Some items of possible interest to members are these:

Dr. David Chalmers (PhD from Illinois) has been hired to replace recently retired John Shoulders as Turfgrass Extension Agronomist.

Favorable reports are given ridomyl (Subdue) in previcur (Banol) for control of pythium disease. Both are systemic.



#### SUMMER "TEXT TURF TOPICS" - continued

Schmidt deflates reports of usefulness of gypsum, as a turf treatment in Virginia.

Brown restates customs and laws relating to lawnseed quality, especially as related to cultivar and weed seeds.

Brumbeck, an agricultural meteorologist, notes the continuing seriousness of drought in Virginia, in spite of generally normal rainfall in spring (the deficit of 1980 is being carried over, without replenishment of soil reserves; seriousness is greatest in central and eastern Virginia, the deficiency little in southwest Virginia).

Hall reviews the sod industry in Virginia. Over 2,000 acres are in production, with gross value of nearly \$2400 per acre. Greatest demand is for bluegrass blends. Bluegrass-fine fescues mixtures are losing favor, while bluegrass-tall fescue combinations hold steady. Three- and four-variety blends predominate.

#### MIXING GRASSES FOR FUSARIUM CONTROL

Research in California is reported in the July/August Turf News, by Gibeault et. al., in which percentages of perennial ryegrass were mixed with Kentucky bluegrass (Park) and performance noted. The addition of the ryegrass (a combination of Manhattan and Pennfine) considerably improved performance. For one thing, it masked the occurrence of Fusarium roseum, but also color was improved. The authors do state that bluegrass has better summer vigor than perennial ryegrass in southern California. In winter the ryegrass shows better vigor. Above ten or fifteen percent of ryegrass in the mixture no significant difference was detectable in the scores, although slightly higher ratings were obtained when ryegrass constituted twenty to fifty percent of the mix. The authors were particularly impressed that mixes of Kentucky bluegrass and perennial ryegrass effectively eliminated Fusarium blight.

#### COMPETITION BETWEEN GRASS AND ORNAMENTALS

Fales and Wakefield, Rhode Island, report in the July/August Agronomy Journal on "Effects of Turfgrass on the Establishment of Woody Plants". Fescue, ryegrass and bluegrass inhibited growth of Dogwood and Forsythia. The effect was not due to competition for water, and generally not for nutrients. Leachates from the grasses inhibited growth of the woody plants, indicating allelopathy. Ryegrass and red fescue leachates suppressed root growth as well as top growth, supporting the contention for thorough-going chemical suppression.

#### CENTIPEDEGRASS FROM IRRADIATED SEED

Dickens et al, Alabama, report in the July/August Agronomy Journal on research in which centipedegrass was grown from irradiated seed. Considerable variability was induced, indicating the feasibility of this method for producing new cultivars.



#### MORE ON PERENNIAL RYEGRASS

C. Reed Funk, Rutgers, discusses "Perennial Ryegrass for Turf" in the July/August issue of Turf News, American Sod Producers Association. Reed notes the derivation of most ryegrasses from a benign, maritime climate in Europe, and the need for introducing germplasm from more rigorous environments in order to accommodate the species better to continental climates within the United States. Dr. Funk cites modern ryegrass breeding triumphs that have come to market, and notes the ways in which they are impressive improvements over pasture and meadow forebears.

Funk tabulates winter hardiness (New Jersey) for most familiar cultivars, with Blazer, Yorktown II, Diplomat, Fiesta, Omega, Regal and Manhattan showing no winter injury. NK-200, Citation, Derby and Pennfine exhibited slight to moderate injury. In disease resistance (to brown blight) Manhattan led, followed by Yorktown II, Blazer, and Yorktown: Derby, Linn, Birdie, Pennfine, Citation and Ensporta all showed greater injury. Summer performance of Citation, Pennfine, Yorktown II, Diplomat, Omega, Fiesta, Blazer, Derby and Regal have generally been good. Yorktown II, followed by Diplomat, Fiesta, Dasher and Blazer have shown the greatest turf density.

Funk seems satisfied that the modern turfgrass cultivars all have ability to produce an attractive turf. All of the modern ones seem to mow neatly (Loretta and Elka are said to show the best mowability during cool weather). Early-flowering cultivars such as Regal, Citation, Derby, Pennfine, Birdie and Pennant produce stemmy seed-head stalks during May, and temporarily mow less well at that time. Funk notes that ryegrass color is frequently lighter than that of Kentucky bluegrass, but that Citation and Yorktown cultivars are among the darker ones. The modern ryegrasses endure light shade well, and of course are easy to establish and are available as high quality seed.

#### LONGEVITY OF WEED SEED IN THE SOIL

Germination studies with various weed seeds buried in eastern and western Nebraska are reported upon by Burnside et al in the September Weed Science. Several grasses, including fall panicum and green foxtail exhibited great (predicted) longevity, with large crabgrass intermediate. Certain milkweeds, dogbanes, kochia and sunflower had the shortest life span. As to crabgrass, a familiar problem weed in lawns, an initial dormancy of a year or two preceded a short interval of greater germination, after which the percentage of germination tended to plateau almost indefinitely. The authors to conclude that, "Once a field is infested with large crabgrass, seed survival in soil will insure a continued presence of this weed for a decade or more." Other species long-lived in the soil that may occasionally infest lawns include redroot pigweed (Amaranthus), and perhaps groundcherry (Physalis).

#### NITROGEN FERTILIZATION OF GRASS

A study on "The State of Nitrogen Fertilizer Applied to Turfgrass" was undertaken by Starr and DeRoo, Connecticut, and reported in the July/August Crop Science. In part tracer nitrogen was used to provide quantitative measurements. It was found that clippings, when returned to the lawn, increased grass growth about one-third, and supplied nitrogen about equally as from the soil and applied fertilizer.



#### CALIFORNIA TURFGRASS CULTURE ISSUED

Numbers 2, 3 and 4 of Vol. 30 (spring, summer and autumn), 1980, of California Turfgrass Culture (University of California) were combined as a single issue. Featured item was research already reported upon in Harvests, in which the mixing of perennial ryegrasses (Manhattan and Pennfine cultivars were used) with Kentucky bluegrass (Park) eliminated or camouflaged the symptoms of fusarium blight. As little as ten percent ryegrass by seed weight was effective.

Other reports dealt with lawn renovation, in which glyphosate is apparently the preferred knockdown chemical (although others are mentioned). But it has not been 100% effective with bermudagrass (even though nearly so with tall fescue and kikuyugrass). A rather elaborate series of steps is outlined for the procedure.

Other reports are directed towards the control of spotted spurge (Euphorbia supina) in various turfgrasses. The "habits" of spotted spurge seed are detailed (it is responsive to environmental conditions, with germination and dormancy related to time of seed set as well). Among pre-emergence chemicals DCPA was the most effective, but even it had to be applied several times for very effective control. Among post-emergence chemicals bromoxynil was the most effective, but at the rates necessary gave temporary tip scorch to both bermudagrass and bluegrass (even worse damage to tall fescue). Nor was it 100% effective in controlling the spurge. Spurge germinates and tends to become a problem only when soil temperature warms to the 55-60°F range, which in California occurs mid to late March.

Kentucky bluegrass and perennial ryegrass cultivars were rated for resistance to rust (Puccinia striiformis). Considering VRB cultivars, Merion and Plush experienced severe rust, Touchdown moderate attack, while other cultivars showed resistance. Among perennial ryegrasses Citation, Derby, Dipomat, Manhattan, Omega and Regal experienced moderate attack; Fiesta, Pennfine, and Yorktown II showed immunity.

#### GRASS, SEEDING RATE, AFFECT POA ANNUA COMPETITION

Research at Penn State University is reported in the August Weeds, Trees and Turf magazine. It was found in these investigations that most of the elite cultivars repressed Poa annua invasions more than did "common" type bluegrass such as Newport. Also, light seeding rates (about one pound per thousand square feet) did not repress Poa annua nearly so well as heavier seeding rates of three pounds or more (very heavy rates, however, caused such intense competition that seedlings were killed, resulting in the condition equivalent to a very light seeding rate).

#### GLYPHOSATE AND QUACKGRASS CONTROL

Research by Ivany in Canada, reported in July Weed Science, indicates that autumn applications of glyphosate are more effective than spring ones for controlling quackgrass (especially at light rates), and generally give good control. Nitrogen application prior to herbicide treatment did not enhance effectiveness of the glyphosate, which was generally superior to other herbicides tried.



#### BILLBUG INJURY TO BLUEGRASS

Lindgren et al, Nebraska, report on "Kentucky Bluegrass Cultivar Response to Bluegrass Billbug, Sphenophorus parvulus" in the June HortScience. Readings of billbug damage according to cultivar were made, and frequency of billbug larvae were determined. Least bothered by the pest were a number of common type bluegrasses, with Arboretum second most resistant. Nugget was fairly resistant, but had been quite susceptible in an earlier test. Moderately affected were Touchdown, Birka, Vantage, Ram I, Wabash, Adelphi, Merion and Fylking. More severely damaged were Majestic, Merit, Glade and Sydsport among others. Thirty-eight cultivars were compared.

#### ENHANCE CRABGRASS CONTROL

Johnson, Georgia, improved performance of both bensulide and DCPA, but not a prosulfalin, by combining it with MSMA for crabgrass control. The research is reported in July Weed Science. In general bensulide controlled a greater percentage of weeds than did DCPA, in both Kentucky bluegrass and common bermudagrass. It was immaterial whether the MSMA was tank-mixed with the other herbicides, or whether the products were applied separately. Full control of large crabgrass was achieved with bensulide applications from March 19 to May 14 in northern Georgia.

#### GREENBUG TESTED ON TURFGRASSES

Research at the University of Kentucky, reported in the August HortScience, indicates that the type of aphid known as greenbug may severely attack all cultivars of Kentucky bluegrass, as well as Chewings fescues and tall fescues. However, perennial ryegrass, bentgrass, zoysiagrass and bermudagrass did not sustain greenbug populations, nor did many familiar lawn weeds such as dandelion, plantain, ground ivy, pigweed, Duchesnea, violet, crabgrass or Oxalis. The research was conducted by Jackson, Vessels, and Potter.