

BETTER LAWN -- HARVESTS

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SPRING PRESS KIT IN PRODUCTION

Background work has been completed on the spring press kit, which is turned over to Middleton Printing for production and issuance in early February. The Institute's kit for the spring of 1982 is patterned after those of other years. It will be mailed bulk mail, in the now familiar "green grass" file folders and logo envelope.

A covering letter and 18 pages of text, with three supporting reprints constitute the kit. Items range from slightly over two pages or those just a few lines in length, embracing 20 titles. Reprints documenting the mailings are "A Spring Tune-Up for Your Lawn", "Turfgrass, The Times and Some Trends", and "Evolution of Improved Lawngrasses in America: A Review of Major Events Leading to the Kentucky Bluegrass Cultivar Revolution".

JOINT "SUPPLEMENT" READIED

As has been customary, the Institute again prepared the text for next spring's "Joint Supplement", co-sponsored by several associations. The Lawn & Turfgrass Division of the American Seed Trade Association jointly shares Institute participation, for which Bob Falasca and the officers of the Division are to be thanked for their prompt attention and assistance. As this is written we still have not heard from Pflaum exactly how many associations are involved in the 1982 issuance of Lawns, Gardens and Pools, but our contribution has already been put up in type and we have checked proof of the items. Twenty-one titles have been submitted by the Institute of which the great majority, if not all, will be used. Numerous photographs have also been turned over to Pflaum, from which four or five will be

chosen to illustrate lawns and turfgrasses. We have not at this time heard what the full length of the Supplement will be (this depending upon total sponsorship), but ordinarily it is 18 folio-size pages.

SEED INDUSTRY STORY PREPARED

A story entitled "What It Takes To Produce Good Lawnseed" was prepared during the quarter for the International Turfgrass Journal, Rasen, published under the editorship of Professor Peter Boeker, Bonn, West Germany. Reprints will be circulated when obtained. The story opens contrasting the modern era of well-bred lawngrasses with a former era when "lawnseed" was merely harvested from pastures temporarily withheld from grazing. What an excellent bargain modern lawnseed represents is emphasized. Figures obtained from Doyle Jacklin are utilized to depict the multifarious costs involved in modern lawnseed production, and show that considerable financial outlay is required as well as a great measure of technical skill. A measure of "luck" (weather and uncontrollable events) must accompany efficiency in order to obtain reasonable profits.

STORY PREPARED FOR AMERICAN HORTICULTURE SOCIETY

The story "Assessing Lawn Perturbances" was prepared during the quarter for Judy Powell, Publications Director of the American Horticulture Society, for probable use in the American Horticulturist. This idea has been on a "back burner" for some time, while Supplement materials were readied and other deadlines met. The story is not scheduled until late summer of 1982, which gives time enough to discuss illustrations. "Assessing Lawn Perturbances" attempts to distinguish different causes for lawn malperformance, with instructions as to what to do about such situations. The final caution with respect to lawn diseases, for example, calls for, - "The most practical defense against diseases is to plant lawn cultivars selected for disease tolerance. Greatest assurance comes from blending or mixing several good cultivars together."

FEATURED BY MEN'S GARDEN CLUBS OF AMERICA

The October/November/December issue of The Gardener, official publication of the Men's Garden Clubs of America, devotes most of the inside back cover to three Institute pickups, under the general heading "From The Lawn Institute." Included are "Selection of Lawngrasses", which discusses new lawn cultivars, naming specific types; "Kentucky Bluegrass, Turfgrass Extraordinary", which points out the strengths of this species as a lawngrass, and names the Variety Review Board cultivars; and "Fertilizer Lasts Through Winter", which notes "Although bluegrasses, fescues and ryegrasses grow only slowly in the cold of winter, fertilizer applied in autumn is not wasted. ---"

ARTICLE TO APPEAR IN AMERICAN LAWN APPLICATOR

Because of publishing difficulties, a fairly lengthy presentation entitled "Autumn Jamboree in Lawnland" did not appear in Landscaping, Lawn & Garden magazine because of publishing delays which made the seasonal nature of the item inappropriate. With some slight revision, the material was offered to American Lawn Applicator, where it is scheduled to appear for a more technically-oriented audience not so wedded to the seasonal approach. The story begins with autumn "to dos", and proceeds in chronological fashion, with lawn care procedures related to the apparently more serious mood of the country these days. The usefulness of lawns in the urban landscape is stressed, and an up-to-date Variety Review Board listing (with thumbnail descriptions) is provided. Ample illustrative material is included.

NEW LAWN BOOK IN OFFING

Tom Richards, Executive Vice President of the American Horticultural Society, telephoned the Institute asking if Dr. Schery would review galley proofs for a new book on lawns being printed by the Franklin Library (a division of Franklin Mint). When the galley was received it proved to be a potpourri of the Ortho books published several years ago in California (there were three editions, for the North-east-Midwest, South and West). The text is skillfully written, but, unfortunately, seems to reflect talented writing more than lawn expertise. A number of the subject areas are appropriate mainly for Southern California, and the overall impression given is that having a lawn requires a lot of measures that most people find unnecessary, or at least do not undertake. Among them are such things as underground irrigation, soil sterilization, aerification, elaborate soil-testing operations, etc. However, improved turf-grass varieties are recommended, and the book should contribute to the ferment of interest in lawns and their care.

STORY FOR RASEN

In a previous Harvests we mentioned sending some prepared manuscript on hand entitled "Lawn Seasonal Scenerio", to Dr. Peter Boeker, Editor of Rasen, the West German International Journal on turf-grass science. While this overview of operations in North America may appear a bit "popular" for Rasen, we have received word from Dr. Boeker that it provides a good impression of what is done where climatic conditions are different from what is generally experienced in Europe. Dr. Boeker writes, "I accept with pleasure your paper and hope I can get another one during the course of the next year." Somewhat later the publisher, Hortus Verlag GmbH., requested urgent need for a summary, which will appear in English, German and French, to accompany publication of the piece.

SEEDSMEN'S DIGEST ANNOUNCEMENT

The November issue of Seedsmen's Digest, page 30-31, announced Institute elections for the fiscal year under the headline "Rothwell Relected by Lawn Institute". General organization, staff office address, Variety Review Board activities and other details are outlined.

TECH TURF TOPICS IS THOUGHT-PROVOKING

The November issue of Tech Turf Topics, newsletter from Virginia Polytechnic Institute, carried a couple of items of interest to Institute members. David Chalmers, Extension Agronomist, in a lead-off piece entitled "Managing the Old and Thinking About the New", strongly praised new lawngrasses. His point was that anyone trying to care for old-fashioned turf was at a distinct disadvantage compared to the enviable results that others would show where new varieties had been planted. He states, "When the burden of managing older or less adapted strains becomes too great -- the choice at hand is to try to improve the turf through periodic overseeding or complete renovation using improved varieties". This page-and-a-half constitutes a strong recommendation for new cultivars, and if any of you who don't see Tech Turf Topics can use a copy we'd be happy to photocopy Chalmer's write-up for you.

Two other items deal with winterizing irrigation equipment, and the registration of Oftanol as a lawn insecticide. But more intriguing is John Hall's thesis, "Aerification - A Missing Link in Today's Lawn Service Industry?" Hall feels that the lawn service is quite useful, but that after a few years treated lawns begin to go downhill. He believes this is due to thatch build-up because of fertilizer stimulation and reduced decomposition due to pesticides. The lawn service industry is soon going to have to face up to this problem, says Hall, in order to keep clientele satisfied. Yet, there are no simple and effective answers to the problem. So far none of the decay inoculants have proven of much use, and de-thatching is rather drastic (not only expensive, but unsightly and often initiating other problems). The best he had to suggest is core aerification with a drum aerifier, perhaps custom designed to shred the cores causing them to mingle with the thatch for improved decay. This is the first published statement we have noted indicating that lawn service results in declining turf after a few years.

EDITORIAL REVIEW FOR AMERICAN LAWN APPLICATOR

A story entitled "Managing Urban Habitat" was prepared for American Lawn Applicator, to help round out a series being developed for that magazine. The thrust of the discussion is whether custodians of urban turf are taking full advantage of their opportunities, in the sense of being "ecological heroes" for which their environmental expertise could well equip them. Pressing problems throughout the world call for seriousness, even grimness, a relatively new attitude in America. Yet rather little has been done to make the American public aware of the many benefits which accrue from intelligent management of urban habitat, for which lawn service and landscaping afford key assistance. Would not an ecosystem approach, similar to environmental assessment procedures required by NEPA, be appropriate for showing how useful planted and tended landscape is to the urban ecosystem, and how it ties in with human interest concerning environmental events worldwide?

ANNUAL MEETING ACCOUNCEMENT

The announcement "New Lawn Institute Officers/Board Elected" appears on page 63 of the October issue of Western Landscaping News. The full text of the distributed announcement was used, beginning "Norman Rothwell, N.M. Rothwell Seeds, Lindsay, Ontario, Canada was reelected incoming president of the Lawn Institute at its annual meeting ---". Thereafter other officers and board members are listed with company affiliations.

INSTITUTE HELPS WITH SPECIAL ISSUE

Jerry Johnson telephoned from California requesting Institute help with a review being prepared for Lawn & Garden Marketing. Turfgrass cultivars would be covered in some detail, and a color picture would be utilized for the cover of the issue with credit to the Institute. He was sent for background several literature items, including a review of the Institute and its program, plus candidate color transparencies. The Variety Review Board and its listings is expected to be a focus of interest in the Johnson story.

LAWN INSTITUTE ASSISTS WITH CANADIAN PUBLICATION

A book being prepared for John Bradshaw, Toronto, by Larry Goldstein requested of the Institute colored photographs which could be used in the book with credit. Bradshaw had been in touch with Dr. Schery by telephone shortly before discussing suitable fertilizer formulae for Ontario conditions. Goldstein was sent five transparencies immediately, from which to make a choice for the book's cover.

ANOTHER NEWSPAPER READER SERVICE

The Asbury Park Press, Asbury, N. J., sent us an inquiry about surfacing bocce courts, received from one of their readers in Whiting, N. J. Jack Hastings is the "Trouble Shooter" who offers a "request for help" column in the daily and Sunday Press. The Institute was asked to field this particular problem. It is indicative of the kind of thing we have seen occurring nationally, particularly with "Action Time" from Chicago (which contacts the Institute periodically about lawn matters).

MASS HORT CONGRESS TO DISCUSS TURF ACTIVITIES

Dr. Schery was invited by the Massachusetts Horticultural Congress to discuss with them January 21 the latest research concerning new lawngrass cultivars, their establishment (both from seed and sod), and satisfactory care. Institute literature will be made available to the nurserymen meeting at Hyannis, January 20-22.

INQUIRY FROM AFAR

A surprising letter was received in early December from Moscow, properly addressed but the return address and cancellation not intelligible to persons unfamiliar with the Russian language. It was from the All-Union V. I. Lenin Academy of Agricultural Sciences, of which the Central Scientific Agricultural Library, Department of International Book Exchange, wished to "purchase" Harvests. The request from A. Bochever, Director, was pleasant and expressed in perfect English. No indication was given of where the Academy heard of Harvests, although it might be from some trade publication forwarded by the Soviet Embassy? It seems unlikely that the Academy is aware that Harvests is only a mimeographed newsletter sent to Institute members.

SIGNIFICANT SOIL LOSSES

McCormack, USDA, reported to the Agronomy Meetings that annual losses from soil erosion amount to about \$16 billion, plus \$3 billion due to soil compaction. Soil-protecting grass certainly has a role to fulfill.

LITERATURE TO EDUCATORS

The Institute has cooperated with Educators Progress Services, Inc. in supplying reprints and advisories without charge. The materials are offered to educators and librarians, frequently as multiple copies for the classroom or reference. Again in 1982 the Institute will be listed in the current "INDEX" of this organization, which results in periodic requests throughout the year. We have been pleased with this relatively cost-free means of disseminating Institute literature.

LAWN GRASSES ASSIST WITH CARBON BALANCES

The Ecological Society of America held a summer symposium on "Global Dynamics of Biospheric Carbon". That carbon dioxide in the atmosphere has been increasing for the last century or so is well recognized, leading to fears that this "pollution" (mainly from fossil fuels?) may cause climatic change melting Arctic ice and raising sea levels.

One might speculate on the removal of carbon dioxide by lawns, particularly in urban areas. Symposium speakers noted that terrestrial ecosystems do act as a long term sink for carbon dioxide assimilated from the atmosphere by photosynthesis, and thus help correct carbon dioxide "pollution". Lawngrass would not be so important as trees (reforestation), of course, but lawn plantings in urban areas do afford some short-term carbon immobilization. Incidentally, increased carbon dioxide levels enhance plant growth though physiological responses may vary with differing crops.

TECHNICAL SECTION

AGRONOMY MEETINGS, ATLANTA

It has been customary to summarize very briefly in Harvests presentations relating to turfgrasses made at the annual Agronomy Society meetings, this year held in Atlanta, November 29-December 4. This year the gist of the coverage is taken from the abstracts prepared by the authors, since Dr. Schery attended the Ohio Turfgrass Conference rather than the Agronomy Society meetings, and could not provide personal coverage.

Overall, emphasis seems to have shifted somewhat away from cultivar testing, to investigation of fertilization and associated biological considerations. With water shortages impending in various parts of the country, irrigation, too, received attention. The following resume deals first with presentations about grasses; papers concerning northern species are reviewed as a group, southern species following.

King, Arkansas, found tall fescues to be best adapted to his climatic area, although bluegrasses developed fairly good stands given adequate fertilization. Among the top twenty cultivars in mid-July were ten tall fescues and ten bluegrasses; the top three were tall fescues (led by Rebel, Clemfine and Belt-TF-16).

Shearman et al, Nebraska, found that bluegrass cultivars reacted differently to soil compaction. In most cases, compaction reduced lateral growth (not so with Vantage and Cheri). Compaction also induced more stem rust disease.

Patten et al, Texas, found Common and Seville st. augustine strains to be most cold tolerant. Dudeck and Peacock, Florida, found several millets to make good temporary groundcover (for protecting soil) while several seeded and vegetatively planted southern grasses become established.

Ahn et al, Illinois, investigated ways in which potassium hydroxide "scarification" reduces hard seed with zoysia. Portz and Ahn further investigated practical ways for seeding waysides with zoysia: bluegrass, ryegrass and tall fescue could be used along with treated zoysiagrass seed. Introducing zoysia into existing vegetation was more difficult, and was most successful by drilling and verticutting following a three week old pretreatment with glyphosate (glyphosate treatment immediately prior to seeding was not successful).

Brede and Duich, Pennsylvania, investigated mixtures of Touchdown bluegrass with Pennfine ryegrass, and concluded that proportionment did not much influence shoot density, but that shoot density was quite dependent upon total seeding rate. Bluegrass proved better able to compete against ryegrass when seeded at higher rates.

AGROMONY MEETINGS, ATLANTA - Continued

Presentations relating to fertilization were numerous. Almodares and Brown, Texas, found sewage sludge to encourage fastest coverage with bentgrass, although results varied with other organics depending upon mode of incorporation or application. Bridges and Powell, Kentucky, found that fertilization of Kenblue Kentucky bluegrass influenced the deeper soil little, but could affect pH of the thatch and surface soil appreciably. Thatch increased as nitrogen fertilization increased (and earthworms decreased); grass injury in summer was also intensified under high fertility.

Bruneau et al, Nebraska, tested both urea and UF on transplanted sod rooting. Root production was greater with UF than with urea, and best when the fertilizer was applied to the sodbed or incorporated into the sodbed. Carrow, Kansas, checked out several gradual-release nitrogen sources on Baron bluegrass and found a March plus September application superior to a spring only application. UF did not provide acceptable visual quality, but yielded greater rhizome weights and non-structural carbonhydrates than did SCU, or I.B.D.U. plus SCU.

Hummel and Waddington, Pennsylvania, found spring application of certain SCU formulations to do very well on bluegrass, but that at least three pounds per thousand square feet of nitrogen are needed to maintain quality of turf that they find acceptable. McBurney et al, Michigan, experimented with bluegrass sod on potassium-deficient soil. The response from potassium fertilization was marked, - an increase in rhizome tips from 3.1 to 23.3. Although phosphorous was also deficient, response from phosphate treatments was not noted. This is one of the rare instances of a notable response to potassium.

Petrovic et al, Cornell, found heavy metals in sewage sludge to be detrimental to bluegrass, and advise caution with sludge from industrial areas (causes poor seed germination as well as reduced shoot growth). Torello et al, Illinois, examined nitrogen loss through ammonia volatilization from turf growing on acidic soil. Urea sprays lost more ammonia than did SCU applications (negligible losses); thatch had no apparent influence. The authors suggest that regardless of underlying soil characteristics, there are "above soil" mechanisms influencing ammonia volatilization.

Varco and Sartain, Florida, assessed the influence of major and minor nutrients on Poa annua. Sulfur resulted in a reduction of stand, but dry matter yield was significantly increased by application of phosphorous and lime (although reduced in the presence of sulfur). Wehner and Torello, Illinois, checked urease activity in thatch and soil. The enzyme was up to thirty times more abundant in turfgrass clippings and thatch than in the soil. It is not clear just what the influence of urease may be, for the authors state it had no affect on short-chain UFs. In any event the urease activity of thatch seems vastly different from that of the underlying soil, and urease may

AGRONOMY MEETINGS, ATLANTA - Continued

play an important role in the fate of applied urea. Horst, Texas (El Paso), found supplemental iron applications to enhance root growth of bermudagrass on soils of the region.

Duff, Rhode Island, investigated allelopathic influences in plants of the lawngrass community. Using cucumber seedlings as the test, extracts from perennial ryegrass were more inhibitory to root growth than were those from Kentucky bluegrass or fine fescue. Crabgrass was more inhibitory than goosegrass or quackgrass. Red sorrel (Rumex acetosella) was quite inhibitory, more so than mouse-ear chickweed and knotweed (although all of them were significantly allelopathic). Yellow nutsedge was similar. It is apparent that there are many interacting allelopathic influences operative in a lawn.

Haley et al, Illinois, compared mulching and conventional mowers used to mow Baron Kentucky bluegrass. Frequent mowing under a moderate fertility regimen gave best quality; poorest quality resulted with frequent mowing with clipping removal and failure to fertilize. Mulch mowing was acceptable except when high levels of nitrogen were used. In Massachusetts, Troll and Hurto also investigated mowing treatments. Clippings removal was detrimental if not compensated for with supplemental fertilization, and it increased dollarspot infection. Frequent mowing was beneficial. Mulch mowing seemed beneficial in fostering leaf decomposition and nutrient mineralization, resulting in higher shoot density and better quality. Mowing frequency, nitrogen fertilization, and growth patterns were more influential than type of mower, however. There was no differential in thatch depth, but earthworm activity was greatest where the clippings were returned.

Hurto and Veneman, Massachusetts, found coring and topdressing to help control thatch (coring, with the cores reintroduced, provided greatest benefit). Sartain et al, Florida, inoculated thatch with four fungi, one of which was especially effective in lowering cellulose and lignin levels. White and Dickens, Alabama, found coring, vertical mowing or topdressing to control thatch of bermudagrass cultivars, although frequent topdressing alone was just as effective as in combination with other treatments. Tifgreen bermudagrass accumulated less thatch than did Tifdwarf or Dothan, and plots receiving ammonium nitrate accumulated less thatch than those fertilized with Milorganite.

Augustine et al, Florida, note that conservation measures in turf irrigation have resulted in savings of up to 89% over conventional irrigation while still maintaining turf quality. Danielson et al, Colorado, have been particularly concerned with matching water needs in the high plains and noted only moderate decrease in the quality of Kentucky bluegrass with decrease in available water to as low as 40% of maximum evapotranspiration. With adequate nitrogen fertilization, there was little decrease in quality until irrigation was reduced below 70%. Higher mowing provided higher quality than lower mowing.

AGRONOMY MEETINGS, ATLANTA - Continued

when watering levels were reduced. Buffalograss showed approximately 20% lower maximum evapotranspiration than bluegrass and tall fescues, but its quality decreased more severely under deficit irrigation.

Also at Colorado, Feldhake et al found the average daily evapotranspiration to be about 6 mm/day. Kentucky bluegrass mowed five centimeters tall used about 15% more water than when mowed at two centimeters (related to more rapid regrowth). Buffalograss and bermudagrass used 20% less water than Kentucky bluegrass and tall fescue. O'Neil and Carrow, Kansas, found that soil compaction reduced water consumption by 31% (shoot growth and rooting of the grass were adversely affected by the compaction). Sheffer and Dunn, Missouri, found no anatomical differences accounting for summer drought survival of bluegrass, perennial ryegrass and tall fescue; rather, tall fescue rooted deeper than ryegrass which rooted deeper than bluegrass, accounting for the respective improved drought response.

Johns and Beard, Texas, reduced transpiration in st. augustinegrass by use of growth inhibitors. Up to 29% less water was used by some treated plots. Peacock and Dudeck, Florida, induced water stress in st. augustinegrass by irrigating less than a quarter inch per day, spaced as much as six days apart. Two, three and four day spacing did not materially reduce apparent photosynthesis, but the six day spacing severely reduced it and the turf quality was significantly lowered. Stahnke and Beard, Texas, found certain antitranspirants to reduce evapotranspiration rates without visual damage to Penn-cross creeping bentgrass or Tifway bermudagrass.

In pesticide investigations, Bishop et al, Nebraska, found greater injury to Kentucky bluegrass from billbugs under taller mowing and lower fertility. Branham et al, Illinois, developed a new technique for studying pesticides in the microecosystem utilizing a porous ceramic plate. Dickens, Alabama, found that ethofumesate could selectively control annual bluegrass if two applications were made two to four weeks after seeding and repeated at eight weeks. Johnson, Georgia, reports effective control of Allium by repeated treatments of 2,4-D combinations in early winter, or by using glyphosate on dormant bermudagrass.

Kaufmann, Michigan, found that mefluidide and MBR-18337 reduced both seedhead formation and senescence of annual bluegrass the following spring/summer if applied in autumn. Such treatments are for possible use where one wishes to retain Poa annua through summer. Symington et al, Massachusetts, found these and other growth retardants to suppress growth, most of them to inhibit seedhead formation, with all treatments causing some degree of injury to the grass.

Johnston and Dickens, Washington and Alabama, note chlorophyll damage to tall fescue from ozone (after six weeks of ozone exposure, 13% less chlorophyll, 27% less magnesium). Karnok and Kucharski, Ohio explained how to monitor root growth in a rhizotron by use of ultraviolet radiation.

RESUME OF THE OHIO TURFGRASS CONFERENCE AND SHOW

The 1981 Ohio Turfgrass Conference and Show was held at the Ohio Center, December 2-4, 1981, a time which again conflicted with the American Society of Agronomy meetings held in Atlanta the same week. However, the Ohio Conference was well attended, with many national authorities on the program and an impressive display of exhibits adding interest.

Jim Beard, Texas was keynote speaker, discussing "Challenges in Turfgrass Management in the 1980's". Beard drew on his lengthy experience and wide travels for an assessment of the current situation. He concludes that change is coming fast, but that there is perhaps more to be encouraged than discouraged about. He noted that the Roman Coliseum (which he pictured) anticipated modern stadia, seating 100,000 people centuries ago, even sporting a "dome" (canvas cover). He suggested that the first formal turf, tended chiefly by grazing livestock, was the bowling greens of England, which soon expanded to include cricket. Ornamental design with turf began in France in the late Middle Ages, in the gardens of royalty. The Budding patent for a lawnmower in 1830 perhaps best marks the ushering in of the modern era.

Beard cited the many advantages turf lends, - control of erosion, dust, heat, noise, glare, visual pollution and safety. Esthetic benefits are equally praiseworthy, but harder to define. On sportsturf it has been shown that safety and physical health are enhanced with natural as compared to synthetic surfaces. In the general environment lawns typically reduce temperature 15°-37° F in summer compared to asphalt.

Beard feels that manipulating turf has been overemphasized in search of luxuriousness beyond capability of achieving it economically. Some efforts to control problems with pesticides might better be handled by natural adaptation and less demanding standards. But on the whole, of all potential problems including energy shortages, water insufficiency may become of greatest concern. Beard feels that even present knowledge and technology allows turf to be grown using less water than is customary.

Davidson, Dow, Michigan, reviewed the problems that have arisen concerning phenoxy herbicides, with silvex and 2,4,5-T already restricted. He feels that scientific information is well in hand, but that decisions are being made for political and public relations reasons these days. He urges that the safety and value of the phenoxy herbicides be brought to public attention by turfgrass interests as a means of countering this adverse publicity.

Smiley, Cornell, New York, provided his usual provocative review on "Non-target Effects of Turfgrass Pesticides". Dr. Smiley's overall ecological approach is always dramatic. He noted that certain herbicides such as linuron and betasan at times (but not always) cause more serious outbreaks of "fusarium", "brown patch", and so on.

RESUME OF THE OHIO TURFGRASS CONFERENCE AND SHOW - Continued

Fungicides, although potent biocides, generally lack specificity; their effects vary with the rates applied, conditions under which used, and the general ecology. In short, the whole ecological situation is so complex that interrelating influences are barely understood. For example, what are the effects of various pesticides on mycorrhizae, thatch, pH (at various depths), and so on?

Proctor, Mobay, Kansas City, reviewed the properties of the newly available insecticide isofenphos (Oftanol). It is quite safe (category III, requiring only a "caution" on the label). Especially exciting is its long residual in the soil, and the fact that it is not seriously tied-up by thatch. So far federal (EPA) approval grinds slowly towards completion, but the material is available in a good many states, (especially in the Midwest) through special state approvals at this time. Niemczyk, Ohio entomologist, is enthusiastic about isofenphos, particularly for the promise that it offers over presently available short-lived materials.

The remaining portion of the conference was broken down into separate coordinate sessions, - for golf courses, lawn service, and grounds maintenance. Here are a few highlights that could be covered.

Larsen, Ohio, noted that \$2.6 million are spent by Ohio golf courses annually for fungicides, with over \$4 million spent for all uses. Powell, Ohio, noted the trend towards vastly improved spraying apparatus, some of which is already "here" (controlled-droplet apparatus; electrostatic charge conveyed to droplets; etc.) He feels that before long it will be possible to get far better coverage than at present, at only one-fourth present pesticide rates, with practically no danger of drift.

Smiley, in another paper, reviewed turfgrass thatch, a favorite of his. He emphasizes that the balance between tissue production and its decomposition can be tilted one way or another rather readily by stimulation (or restriction) of grass growth, or by influencing decomposition of spent tissues similarly. Some chemicals seem not to interfere with decomposition (a few even seem to encourage it, but the results are doubtfully reproducible). A good many others actually interfere with the normal decomposition processes. Smiley discussed a number of the intricacies involved.

Beard, in a section paper, discussed "Turfgrass Nutrition --", mainly from growth chamber experience (which does not jibe entirely with field experience in Ohio and other northerly areas). He noted that in his testing grass rooted more deeply, were about 50% better, and had better "tone" when nitrogen fertilization was adequately balanced by potassium (about one part potassium for two parts nitrogen). The same was true for survival under extreme cold (soil temperature). He has noted better drought survival when nitrogen is withheld. In a subsequent paper, Darrah, ChemLawn, Ohio, partially contradicted Beard

RESUME OF THE OHIO TURFGRASS CONFERENCE AND SHOW - Continued

in this with a series of fertilization treatments made throughout autumn. Darrah feels a November 1 target date for autumn fertilization is very good, producing then the expected root stimulation without unmanageable topgrowth that aggravates mowing. At least on heavier Ohio soils he finds phosphorous and potassium to have little obvious influence; nitrogen, at reasonable rates, of course, stimulates both growth and desirable color.

Bruneau, Nebraska, reviewed control of spurge and speedwell with herbicides (DCPA works well, with a first application in April, a second about six weeks later). Smiley discussed the "fusarium question", noting that in many cases herbicides incite the disease. Joyner, ChemLawn, Ohio noted the difficulty in diagnosing Rhizoctonia diseases, which are often mistaken for Fusarium even by the professionals. He has found two Rhizoctonia afflictions common in Central Ohio, including the familiar "brown patch" (which is not too serious and from which the turf recovers in time), and a newer "yellow patch" caused by R. cerealis, a cool weather manifestation that also looks much like Fusarium (including "frog-eye" symptoms) from which recovery is questionable. He noted that Touchdown Kentucky bluegrass has proven quite susceptible to "yellow patch", and it may be that what we have been calling fusarium on Touchdown on the Institute grounds is actually this newly recognized yellow patch?

Reed Funk, Rutgers, New Jersey, reviewed the perennial ryegrasses, noting that there are many fine cultivars today making them suitable for a wide range of uses. He mentioned that ryegrass tissues mows a bit better in the shade than in the sun, that Citation and Caravelle have a very deep color (often too dark for the bluegrasses with which they are mixed), that Pennant and Regal have shown good billbug resistance, and other familiar observations about the ryegrass fraternity. Klein, USDA, Ohio, summarized the grub problem, caused by Japanese beetle, various chafers, etc. His was an in-depth discussion aside from insecticide application. He noted the circumstances under which milky spore disease is effective (milky spore will remain expensive because for its preparation individual grubs must be gathered in the field, then be inoculated by hypodermic needle, before being processed as a spore preparation). Tremendous numbers of Japanese beetles have been caught in pheromone and fragrance traps, but the cost-effectiveness is generally marginal and the technique visibly effective only when almost everyone in a neighborhood undertakes trapping. He sees nothing to prevent further spread of Japanese beetle, and for that matter Gypsy moth. A number of controls are known, biological as well as insecticidal, but costs, and difficulties in their application, often make them impractical.

When the full Proceedings is issued, these and other presentations will be reviewed in more detail in a future Harvests.

CALIFORNIA TURFGRASS CULTURE

California Turfgrass Culture 31 (winter, 1981), from the University of California, was primarily devoted to turf grown on artificial media. The lead item "Natural vs Artificial Turf - an Economical Alternative" examines both sides of this question in a paper presented by W. B. Davis before the First New Zealand Sports Convention. Some cases of intensive wear require artificial carpeting. This is very expensive to install, and moderately expensive to maintain. Thus it provides a standard against which to measure natural turf costs. Even when stadia are provided with regulated sand rootzones, the cost of installing natural turf is typically less than half that of the artificial stuff. Other advantages of natural turf are cited, including less costly repair of vandalism, less serious injuries, player preference, a more comfortable temperature (one measurement showed artificial turf to heat to 125°F, whereas growing bluegrass under the same circumstances ranged from 67-83°F depending upon how high cut). Davis provides sand specifications, and in a separate item ones for "Sand Green Construction".

Another item examines the "Fertility Assay of Sands", by J. A. Paul. Surprisingly, about half of the time sands contain sufficient phosphorous and potassium (as judged by growing tests), although nitrogen is invariably lacking, and sulfur not often adequate. Even where phosphorous and potassium are adequate initially, they may turn deficient if clippings are continuously removed.

Gibeault and Cress review the "Effects of Air Pollution Oxidants on Cool-and-Warm-Season Grasses", the substance of which was first reported in the Agronomy Journal over a year ago. All ryegrasses seem rather seriously injured by both ozone and PAN (peroxyacetyl nitrate). Highland bentgrass was little bothered by PAN, and fine fescues were moderately affected by both pollutants. Kentucky bluegrasses exhibited the widest range of differences, the species as a whole being less affected than other cool-season species, but cultivars varying widely. A-34, Campus and Prato were all significantly bothered by ozone while Nugget, Arista, Common, and Fylking were not. Nugget and Park were least bothered by PAN, while Baron was most affected. On the whole, southern grasses were far less bothered by pollutants than northern species. However, Tifgreen bermudagrass and Emerald zoysia, showed mild damage. It is suggested that where grass is subject to continuous influence of ozone and/or PAN that the more resistant cultivars be chosen for planting.

THIRD QUARTER RASEN PUBLISHED

The international turf journal, Rasen (Turf/Gazon), published in Bonn, Germany, under the editorship of Professor Peter Boeker, was received in November. The opening article by Campino and Schäfer, compared monoculture plantings with mixtures, under three systems of management, for a series of years, in Germany. The paper is in German, and the English summary does not make the principles entirely clear. Less quackgrass invaded where plantings were mulched, and where the red

THIRD QUARTER RASEN PUBLISHED - Continued

fescue proportions were increased. Indeed, it seems that inevitably Festuca rubra dominated over Poa pratensis, F. ovina and Agrostis tenuis. Most desirable appearance occurred with mowing as compared to undisturbed growth.

A presentation in English, "Delimitation of Taxa and Cultivars of Red Fescues", by Duyvendak, Luesink and Vos, Wageningen, Holland, revives the question of how to classify various red fescue cultivars. However, the authors fail to come to any very definite conclusions. They recognize that F. rubra is a widespread, outcrossing species with morphological gradations throughout. They note the inability to be very definite about anything except possibly chromosome number (hexaploid and octoploid series occur; however, the chromosome number does not correlate well with morphological features).

Going back to Hackel's monograph of 1822, which for reasons of priority would contribute many specific and subspecific epithets, the authors review the conclusions of other authorities through the years ending with Flora Europaea of 1980. The last named would refer the Chewings fescues to F. nigrescens, but the authors prefer to retain the category as a subspecies of F. rubra under the well-known designation of "commutata". Matters get even worse for the creeping and spreading fescues, with eight possible specific and subspecific designations available.

The authors agree that in Holland ecotypes can be found which fit the subspecies "litoralis" well (hexaploids of coastal areas), and others which might be of the subspecies "arenaria" (octoploids, but none presently in cultivation). They seem to conclude that it is just as well to regard Festuca rubra as devolving into "three cultivar groups", - a hexaploid non-creeping; a hexaploid creeping; and an octoploid creeping. They realize that these are not distinctly demarked and do intergrade. The first would be the typical Chewings, the second the typical creeping red ("rubra", "litoralis", "trichophylla", or other epithets), and the third the strongly spreading types ("juncea", "arenaria", etc.)

The remainder of the issue is given over to discussions of pre-and post-conference tours associated with the Fourth International Turfgrass Conference in Guelph, Ontario; and to the sod rodeo held in conjunction with the conference, and to the sod industry in Canada generally.

CHEMLAWN SYMPOSIUM ON TURFGRASS WEEDS

On October 14-15 ChemLawn Corporation sponsored a "Symposium on Turfgrass Weeds - 1981", embellished with a tour to their research facility in Milford Center, Ohio, with leading investigators nationally in attendance and as speakers. The speakers utilized the full day on October 14, half day on October 15, with the afternoon

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CHEMLAWN SYMPOSIUM ON TURFGRASS WEEDS - Continued

of October 15 devoted to a choice of touring the outdoor research facilities of ChemLawn at Milford Center, or alternatively the plant diagnostic and analytic laboratories north of Columbus. The latter undertake soil testing and residue analyses (including cholinesterase monitoring as a safety procedure for spray operators). Systems for monitoring effluent, and handling computer data, are available. The diagnostic laboratory can be engaged by anyone on a fee basis as well as being available to ChemLawn specialists; it serves to diagnose disease, insect, environmental, and physiological problems. The research facility in Milford Center complements others in Georgia and Florida, and an equipment research center is maintained in Troy, Ohio. ChemScape (for ornamental plantings) has facilities at various locations.

The presentations by invited speakers began with a general review of preemergence herbicides, in which Freeborg, Purdue, discussed the general classes of chemical compounds; Hurte, Massachusetts (now an employee of ChemLawn), noted that thatch can influence behavior of the herbicide, in general making it more mobile than it would be in soils; Shearman et al, Nebraska, reviewed generally the effectiveness and phytotoxicity of familiar preemergence herbicides on northern grasses.

Jagschitz, Rhode Island, reviewed repeated use of preemergence herbicides on cool season grasses over a 14 year span. While there has been some influence upon ecological succession in mixtures (most of the time the herbicides are more detrimental to bentgrass and fescue than to bluegrass, favoring the latter's ascendancy), there is no evidence of serious buildup of residues in any of the plots even after 14 successive years of consistent application.

Schmidt et al, Virginia, discussed peculiarities with preemergence herbicides used on bermudagrass, and Johnson, Georgia, the influence of herbicides on spring transition with various southern grasses. Dickens, Alabama, noted successful control of Poa annua in southern turf, utilizing simple products and techniques.

Witt et al, Kentucky, spoke on nimblewill control, nimblewill being a serious pest in the Midwest without effective selective control since zytron was withdrawn by Dow many years ago. The Kentucky researchers have had good luck using linuron (Lorox), twice at about a two week span in August, with only slight damage to the bluegrass and complete elimination of the nimblewill (bluegrass tip growth seems the only damage and it is temporary).

Bingham, Virginia, zeroed in on goosegrass control in bermudagrass, for which oxadiazon is effective but sometimes phytotoxic. Other specialty treatments included methods for controlling spotted spurge (Shearman et al), buttonweed in bermudagrass (Coats), Oxalis (Emerson), bentgrass green treatments (Callahan), and tolerance in centipedegrass (Dickens).

CHEMLAWN SYMPOSIUM ON TURFGRASS WEEDS - Continued

Thursday morning was largely devoted to concern about possible restrictions on use of 2,4-D. Skaptason reviewed a planned program for retesting the safety of 2,4-D after all these years "just for reassurance". Elmore, California, discussed the possible use of triclopyr as an additive (or substitute) for 2,4-D. The herbicide seems useful, but not as broadly so as 2,4-D, and should be considered as something that can amplify 2,4-D effectiveness. Triclopyr (Garlon) has proven good for controlling Oxalis in California, but even better has been EL72500 (which has not yet been labelled and released for sale). Russell, of Dow, outlined a broad coalition being formed to emphasize the safety of 2,4-D and to help counteract public misrepresentation against the safety of the product (and by implication, herbicides generally). Pate, Florida, reviewed Weed-B-Gon alternatives in Florida where currently 2,4-D is offered in combination with MCPP. Nothing being investigated quite equals the effectiveness of the present Weed-B-Gon, but a bromoxynil plus dicamba with and without MCPA has been relatively good, and especially effective against spurweed.

Currey et al, Florida, gave a rather thorough review of st. augustinegrass behavior under treatment with a range of herbicides. Light rates of 2,4-D have not proven harmful (sometimes temporary discoloration), but MCPA and MCPP are harsher. Dicamba is exceedingly harsh. However, most cultivars of st. augustinegrass tolerate atrazine well, and usually metribuzin (this is sometimes risky under certain conditions; it worked better in Florida than in Georgia). A combination of cyanazin (Bladex) with asulam has given acceptable weed control when used at light rate; it is especially good against species of the crabgrass genus found in southern Florida.

Hess, Purdue, has investigated through ultramicroscopic techniques the mechanics of herbicide applications on the plant leaf. Tremendous diversity is found, and sometimes a herbicide crystallizes into very localized spots which then do not provide ready contact with leaf tissue (even though visually coverage looks good). Troutman, ChemLawn, wound up the sessions with a straightforward review of the problems a lawn care company is confronted with when trying to do a responsible job with pesticides. Especially troublesome is the need to standardize spray truck operations, which may take as much as 8-10 weeks for a complete round of calls, not permitting quick reaction to seasonal changes in all instances.

The tour of the Milford Center research grounds was divided into six stops. First stop involved entomology, in which various insecticides were applied to Kentucky bluegrass turf for long range observation (no differences have yet been noted, and no problems have arisen; earthworm populations on this soil were scant, even where insecticides had not been used). Similar applications of a variety of herbicides has been made to other plots, checking type of spray, volume, effect of repeated sprayings, and so on. While it seems evident that

CHEMLAWN SYMPOSIUM ON TURFGRASS WEEDS - Continued

autumn weed control is desirable, it must be recognized that homeowner interest in hiring services is a spring phenomenon.

Fertilizer compoundings suited to lawn care service treatments was the topic at stop 3. Some slow release of nitrogen is needed, but not long-range carryover (since service calls for four or five visits during the year). It has been noted that spring carryover of nitrogen influence is about the same whether an autumn application is made early (August) or late (October). In general, liquid forms of fertilizer are preferred, because they fit spray truck operations best. Stop 4 demonstrated research treatments analogous to those applied to home lawns; selected homeowner lawns are experimentally treated (with homeowner agreement) to assess consumer satisfaction.

Stop 5 involved ChemScape research, in which ornamentals (such as crabapple trees) are preventively sprayed to reduce scab and defoliation. Elaborate equipment is carried by a ChemScape truck, including spray apparatus able to reach the top of tall trees (as for gypsy moth control) or permitting soil injection (as with prescribed rates of fertilizer). Stop 6 was a demonstration of a typical ChemLawn specialist's truck and its spray apparatus. A new nozzle, with a standardized herbicide canister hooking onto the operator's belt, permits usage of the regular tank mix but injection of a particular herbicide for spot treatment merely by pulling a trigger during the spraying operation. Thus the operator can custom-apply the herbicide only where it is needed, and can diversify a lawn treatment according to requirements (as for shade vs sun, for example). A herbicide need not be utilized where it is not needed.

ABOUT NITROGEN FERTILIZERS

Dr. John R. Street, Ohio, discusses nitrogen fertilizers in-depth in the November/December American Lawn Applicator. A number of informative figures and tables were included, ranging from structural formulae of various synthetic polymers to test results at Ohio State University. The advantages and disadvantages of the several sources of nitrogen are given. In quality ratings for the 1981 spring season at Ohio State University, soluble ureas rated higher than did gradual-release sources. However, by the end of the season the reverse was the case. In very few instances were the differences great (IBDU, and to a lesser extent UF, were notably less effective early in the season). SCU along with IBDU rated most highly in mid-season. Street discusses the details for rating various types of fertilizer, including several characteristics having to do with long-lasting effects (WIN). The article constitutes a handy comprehensive review to have on file should questions about lawn fertilizer comes up.

THE LATEST FROM KANSAS STATE

The Horticulture Department, Kansas State University, kindly sent the series of three envelope-size "booklets", the "Keeping Up With Research" series number 50 (Fescue Turfgrasses), 52 (Perennial Ryegrasses for Turf), and 53 (Kentucky Bluegrasses for Turf).

So far as fescues are concerned the Kansas experts are not enthusiastic about the fine fescues, which are recommended only for the eastern one-fourth of the state in any event. But tall fescue has received widespread usage in this part of the transition zone, and greater enthusiasm for it is anticipated in view of the new breeding program for finer-textured, leafier types. In particular, the tall fescues are more adaptable than the fine fescues to both acid and alkaline soils, compacted soils, wet soils, both high and low temperatures. Fine fescues are criticized for poor response to wet soils (especially in hot weather).

Tests are reported for both Wichita and Manhattan. In Wichita, Monaco proved finest textured, but rated rather lower than Rebel for visual quality both in 1979 and 1980. Belt Syn 16-1 was close behind Rebel, as was Falcon, with most of the pasture tall fescue cultivars reading considerably lower. In Manhattan, Clemfine had the highest visual quality rating for 1980, but was second behind Rebel for 1979. None of the fine fescues gave readings at Wichita that would be considered "acceptable", and only Polar did at Manhattan (with Koket and Jamestown in second and third places).

As to perennial ryegrasses, cultivar performance was somewhat better at Manhattan than at Wichita (a more stressful climatic zone). Not many of the modern cultivars were represented in the Wichita trials. But at Manhattan excellent results were obtained from many of the modern cultivars. The authors state, "At the 1-inch mowing height performance was outstanding for Citation and Diplomat. Derby, Yorktown, Manhattan and Pennfine did very well. When maintained at 2 inches Citation, Derby, Diplomat and Yorktown were outstanding. Manhattan and Pennfine exhibited very good qualities". Only Derby and Regal were relatively free from leafspot infection. Regal Diplomat, Manhattan, and Yorktown were commended for good mowing qualities.

Kentucky bluegrass is the most highly thought-of turfgrass for Kansas and does a bit better in the Manhattan climatic zone than at Wichita. Averaged over six years, visual quality at Wichita was very good for Sodco, quite acceptable for Victa, Majestic, Windsor, Baron, Vantage, and Bonnieblue (with Merion and Fylking rather close behind). At the lower fertility regimen only two cultivars (Victa and Adelphi) had an "acceptable" five year average, but at higher fertility 13 cultivars so rated. These comparisons were at a low mowing height (1"); performance was marketedly better at higher mowing (2-1/2"). The authors note, "With the 2.5 inch cutting height and high N-rate, --- very good quality was apparent for Sodco, Merion plus Baron, Adelphi, Bonnieblue and Vantage".

THE LATEST FROM KANSAS STATE - Continued

At the Manhattan test site four and five year averages were better than at Wichita, both at 1" and 2" cutting heights. Ram I, Adelphi, Glade, and Sydsport were all very good, with Fylking, Touchdown and Baron not far behind. However, from time to time, substantial disease of one type or another was noted on all cultivars. Nugget suffered rather severely, as did Touchdown and Majestic from fusarium.

Thirty-two cultivars were entered into a low maintenance comparison, at both 1" and 2" mowing heights. Little or no irrigation, fertilization, etc. was provided, and appearance did not match that of well-kept turfs. At a 1" cutting height Arboretum led the list, followed by Park (all other cultivars did not reach the "acceptable" level). At the 2" cutting height Arboretum again led, followed by Park, Baron and Merion (with all others below the "acceptable" level). It was remarked that Park showed up rather well under low maintenance, but deteriorated under high maintenance.

The authors summarized that under high maintenance good performance was obtained at both Wichita and Manhattan by Adelphi, Baron, Fylking Glade, Ram I, Sodco, Sydsport and Touchdown; under low maintenance, acceptable cultivars were Arboretum, Baron, Merion and Park. They suggest a blend of from two to four cultivars in order to better counter disease.

SOIL ECOLOGY

Lussenhop, Illinois, reviews the detrital processing of a prairie soil in the August Ecology. Natural processes of this sort are important for understanding thatch control in lawns. Oribatid mites were instrumental in the disappearance of 30% of the fine particulate organic matter on burned-over prairie. We don't often think of microarthropods as being very influential, but this study indicates that they are a significant factor in consumption of organic matter including fungal hyphae and bacteria. As might have been expected, increased plant productivity speeded the processing of plant material by both fungi and mites; physical disturbance of the soil (perhaps analogous to aerification) increased processing of plant materials by bacteria and various mites; root growth was least evident where the processing rate was greatest. It appears that grassland resources limited the detritivores in autumn. This is often a key to nutrient mineralization, and plant nutrient uptake. In their introduction the authors note that earthworm casts contain more bacteria and a greater concentration of available nitrogen and phosphorous than does surrounding soil. In other instances, too, it has been noted that detrital processing is associated with mineralization and uptake, as where bacterial grazing by protozoa and nematodes increases nitrogen and phosphorous mineralization rates. The role of microarthropods may be underestimated.

NEMATODE BENEFITS

Research by Anderson et al, Colorado State, reported in the June issue of Ecology, advances the idea of certain nematodes being useful rather than harmful to plants (as is customarily assumed). Nematode species that graze upon bacteria were investigated, and it was found that their activity facilitated release of nutrients (organic carbon breakdown, nitrogen and phosphorous mineralization) through consumption of bacteria (which had locked-up nutrients temporarily) and dispersal in the substrate. It has been estimated that nematodes can consume about 800 lbs. of bacteria per acre per year, with equivalent release of over 100 lbs. of nitrogen. Total nutrients are not affected, but the amount of circulation is increased and the decomposition cycle shortened. Plants have been shown to respond to this net increase in available nutrients.

USGA GREEN SECTION ON SALT TOLERANCE

The November/December issue of the Green Section Record carries a story on salt injury, the symptoms from which often resemble disease. The author, Donald Hoos, Western Director, cites bermudagrasses as showing best tolerance. He states that creeping bentgrasses have a higher salt tolerance than perennial ryegrasses or Kentucky bluegrasses, and all of them a higher tolerance than Poa annua. Seaside has a higher salt tolerance than Penncross, and in a relative salt tolerance listing bermuda, zoysia and creeping bentgrass rate as "good"; tall fescue and perennial ryegrasses as "medium"; fine fescue, Kentucky bluegrass, colonial bentgrass and centipede grass as "poor". The problem is chiefly a western one, where high salt concentrations impair grass growth, water imbibition, and sodium content causes deflocculation of soil colloids.

COLD HARDINESS RATED

Ibatayo, Butler and Burke, in the October HortScience, report upon research with various bermudagrasses and Paspalum vaginatum grown outdoors in Colorado, and subjected to artificial freezing tests. Futurf and Adalayd Paspalums were not very cold-hardy and did not survive beyond early December in outdoor plantings. On the other hand some of the bermudagrass cultivars were quite hardy, especially if protected by snow. The "Brookings" strain (from Brookings, South Dakota) was the hardiest of all, with another selection from Sterling, Colorado, second in the rating. Tifgreen was reasonably hardy, Tifway least hardy. The freezing chamber tests paralleled the findings outdoors.

GRASSES MAY HELP CONTROL NEMATODES

A study by Lenne, Colombia, reported in the November Plant Disease, notes several grasses which have proved useful in lessening nematode attack on pasture legumes. They seem to produce substances toxic to the nematode (Meloidogyne javanica).

BLUEGRASS SEED PRODUCTION REPORT

Elling, Minnesota, reported to the Agronomy Meetings on "Kentucky Bluegrass Seed Production in Minnesota". Park continues to be the predominant cultivar, with field burning the most effective, economical and practical method of handling crop residues. Surprisingly, Emmundi and Touchdown produced much higher yields when the residue was removed by clipping as compared to burning (after paraquat desiccation). Emmundi yield increased from 66 kg/ha when burned to 595 kg/ha when clipped; Touchdown 96 to 368. Although Park and Monopoly exhibited superior recovery after desiccation and burning, three other cultivars suffered significant stand losses.

TURFGRASS SALT TOLERANCE

Kinbacher et al, Nebraska, reported to the Agronomy Meetings on a greenhouse study comparing salt tolerance of several turfgrasses.

Fulfs alkaligrass (Puccinellia) proved the most salt tolerant of those grasses tested, followed by Kentucky-31 tall fescue, Nugget Kentucky bluegrass, buffalograss, bluegrama and Adelphi Kentucky bluegrass. In another study tall fescues proved more tolerant than meadow fescues.

BLUEGRASS SEEDING DEPTH

Riordan et al, Nebraska, reported to the Agronomy Society on emergence of Kentucky bluegrass cultivars seeded at different depths. Best germinations occur at the shallower depths (0.6 and 1.3 cm) rather than at an inch deep or deeper. Nugget and several common types displayed higher germination than Merion and Bristol at all four depths tested.

CONTROLLING POA ANNUA IN BERMUDA WITHOUT INJURY TO OVERSEEDING

Word comes from Gilbert Landry, University of Georgia Cooperative Extension Service, that Dr. James Miller has found ethofumesate (Prograss, Nortron) to be effective in selectively eliminating annual bluegrass from overseeded ryegrass in dormant bermudagrass. In addition to good preemergence activity, there has been some post-emergence effectiveness. Precaution is needed, however, not to apply to bermudagrass that is not dormant lest injury occur. Apparently the chemical also discolors growing bentgrass a bit. Of course, annual bluegrass can be restrained in dormant bermudagrass rather well with pronamide (Kerb), provided that there has been no overseeding.

GLYPHOSATE FOR WILD GARLIC CONTROL

Troutman et al, Arkansas, reported in the November Weed Science on research investigating the usefulness of glyphosate for controlling wild garlic (Allium vineale) in dormant bermudagrass. The results support Johnson's findings reported to the Agronomy Society. Apparently glyphosate may be only slowly absorbed and translocated so that its effectiveness is enhanced by utilizing a surfactant, by allowing at least 32 hours without rain or irrigation for absorption, and by not mowing for several days after application.

ST. AUGUSTINEGRASS IDENTIFICATION

Green et al, Florida, utilized isoenzyme technique for demarking Florida clones of st. augustinegrass that were indistinguishable morphologically. The research was reported in the Sept/Oct issue of Crop Science. Electrophoresis enabled the separation of groups according to isoenzymatic extracts from the leaf tissue, which in turn could be further divided according to other types of partitioning. In a few cases, there was enough distinctiveness for individual identification, although in general isoenzyme variation remains only a partial indication of genetic differences.

MORE ON 2,4-D CONTROL OF DANDELIONS

Henrietta Mann reports in the November Weed Science on dandelion control with 2,4-D, amplified by techniques of removal of the foliage and tops mechanically ("spudding"). Mann found up to 40% survival of dandelions after conventional 2,4-D spraying, but less than half as much regeneration if this was combined with spudding. Spudding alone was not effective in eliminating dandelions, which could regenerate from even small fragments of root. Defoliation of a dandelion within two weeks after application of 2,4-D diminished the effectiveness of the herbicide, indicating, perhaps, incomplete translocation within this interval. The studies were undertaken in Ontario, Canada, as part of a Master's thesis.

GRASSES FOR SHORELINE PROTECTION

Two species of cordgrass (Spartina) have yielded useful strains now in advanced testing. Cultivar releases are anticipated in 1983 and 1985. Belcher and Sharp, USDA-SCS, told of this research (conducted over a quarter of a century) at the Agronomy Meetings.

CONTROLLED RELEASE OF NITROGEN

Allen, TVA, told the Fertilizer Technology and Use section of the Agronomy Society, of tests comparing several slow-release and soluble nitrogen sources on Meyer zoysia and Tifway bermudagrass. Yields decreased in the order of ammonium nitrate > SCU-25 > SCU-11 > IBDU > UF > non. SCU provided the most uniform seasonal distribution and uptake.