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LAWN INSTITUTE

Harvests

Volume 31 Number 3

THE HARVEST MIX

The Harvest Mix for the October issue features ten turf conference presentations by research specialists and industry leaders. Tennessee, Georgia, Massachusetts and New Brunswick, Canada were the conference sites. Topics selected provide an update on current thinking and state of the art.

The Director has taken this opportunity to follow up on Dr Lean Martel's keynote address at the 1984 GCSAA Convention in Las Vegas. The future for lawns and sports turf is one of expanding opportunity. We can be of greater service. Also, a New Mexico State University Agricultural Experiment Station bulletin is the focus for the Director's review. The evaluation of aesthetic benefits has long been a topic of interest. This New Mexico research sheds new light on how we may learn more concerning the value of our landscape environment.

Rhode Island's Fifty third Turfgrass Field Day rates high on our Score Card of Research Centers of Excellence.

Three articles are reviewed under Threshing the Journals - more in the next issue.

Conference Topics

(Presentations of note)

Seventh Annual New Brunswick Turf Seminar

Dr James Beard

Texas A & M University
College Station Texas

Few turf research specialists have such broad experience with both warm and cool season grasses as does Dr James Beard. In a free wheeling presentation, Jim touched on the following topics as evidence of new trends and research in turfgrass management and science:

Maintenance Level

- High, medium or low. What does this mean ? Is it a range between neglect and intensive culture ? Perhaps four maintenance levels should be recognized - none, low, medium or minimal and high.

- Management of turf with excesses is easy. Application of excesses involves multiple practices to constantly adjust and correct for changes in growth conditions.

- Low level management is more difficult. The turf must make its own adjustments.

Cultivars

- Varietal opportunities are almost unlimited. There are some 90 bluegrasses, 52 ryegrasses, 23 fine fescues, 8 turf type tall fescues and 16 bentgrasses from which to select. Use those grasses with turf characteristics that are best suited for adaptation in the local environment.

- Penncross vs Penneagle ? Penncross is unique, time tested. Penneagle is new and observations indicate that it produces a faster putting surface, has less tendency to thatch, less disease, slower growth rate but more tendency for Poa annua invasion and less traffic tolerance. Perhaps, Penneagle fits best where there is less traffic and Penncross where there is more.

Mowing

- Use of the triplex mower on fairways is increasing the quality of the playing surface. In many situations, this is worth the increased cost. Poa annua control is aided by this process as bentgrasses benefit at the expense of the Poa. Where clippings are removed, more nitrogen is needed. Less water seems to be required where triplex mowing is practiced. Perhaps these same benefits could be realized from other practices.

Nitrogen

- Nitrogen is the nutrient needed in largest amounts. It is mobile within the plant, prone to leaching from the soil, and may be lost by volitalization.

- Nitrogen effects on growth vary from increases in shoots to reduction in roots. Sucrose is needed to make growth. Where there is excess nitrogen, the sucrose goes to stimulate shoots in response to clipping and there is less root activity. Shoots get the carbohydrate first.

- Controlled release nitrogen provides the right amount at any given time and the right total amount for the growth season. Readily available types may provide the right total amount, but too much or too little at specific times during the season.

- Excessive shoot growth must be avoided. It causes frequent mowing, less roots and exhausts carbohydrates. Use not more than one pound of nitrogen per 1000 square feet as water soluble N per application.

- Turfgrass color is important. Dark green foliage is generally not indicative of a healthy turf. Light green leaves are more likely to be correlated with healthy plants. Because green grass is the number one priority, difficulties in turfgrass culture arise. There must be reeducation on this point.

- High levels of nitrogen make grasses more prone to some diseases. Low levels cause the same effect with other grasses and other diseases - for example, red thread, rust and dollar spot.

- Time of nitrogen application is best in late fall. Some caution may be needed where snow mold is particularly severe.

- The more nitrogen used, the more potassium required. This is especially important for best cold survival. The balance between nitrogen and potassium is critical. The same relationship holds for heat and drought survival.

Conference Topics Continued

NEW TRENDS AND RESEARCH IN TURFGRASS CULTURE Continued

- More nitrogen is needed to grow grass than to maintain grass at an existing quality level.

- On greens, from 0.1 to 0.3 pounds of nitrogen per 1000 square feet every ten to fifteen days is a reasonable target. This amounts to 0.3 to 0.7 pounds of nitrogen per 1000 square feet every twenty to thirty growing days. Heavy applications are to be avoided. Small, frequent applications are desirable. A six thousand square foot golf green should yield from one to two baskets of clippings each day as an indication of proper growth.

- Shoot growth and root growth vary with month of the year. These differences are the basis for late fall fertilization.

- Fertilizer applications on dormant turf result in a spring response.

- Fertilizer applications in late fall benefit the turf prior to dormancy. Where winter desication or low temperature kill are common, the late fall application may not be as beneficial.

- Oxamide nitrogen fertilizer is a new development with slow release characteristics. It has a residual activity of twelve to fourteen weeks. There is no initial flush of growth. A good level of green foliage is maintained without overstimulation. Less brown patch and rust have been noted where oxamide is used. A certain amount of growth regulation is common. In addition, anti-senescence characteristics of the grass are being evaluated. With new materials like this under development, the slow release nitrogen fertilizer picture is worth watching.

Phosphorus and Potassium

- Trends indicate use of less phosphorus on turfgrasses. Applications based on soil test data are recommended. Otherwise, phosphorus is generally not needed.

- Potassium is considered the overlooked nutrient in turfgrass culture.

- Luxury consumption of potassium is a yield concept of agriculture not related to turfgrass management.

- Potassium is subject to leaching, like nitrogen and is required in the plant in quantities second only to nitrogen.

- Major amounts of potassium are released from the soil.

- Potassium increases rooting, promotes wear tolerance, decreases proneness to disease and increases drought tolerance.

- Physiological adjustments within the plant that make it more hardy are brought about by potassium.

- Potassium benefits turfgrasses past the point of luxury consumption.

- Potassium is needed at rates of 50 to 75 percent of the nitrogen being utilized by the turf.

Interrelationships

The following practices are interrelated in the production and maintenance of high quality turf:

- topdressing-frequent;
- thatch control;
- smoothing ground surfaces;
- increasing speed (for golf greens);
- root zone modification - partial or complete;
- winter protection;
- correction of unfavorable soil conditions.

Sand Topdressing

- Conditions at the interface between turf and soil are responsible for the relative ease of maintenance.

- Sand topdressing must continue once started.

- The correct sand in terms of particle size distribution must be used.

Hydrophobic Soils

- Sands are most likely to be difficult to wet.

- Soil fungi, many of them basidiomyces, are the cause of hydrophobic soils.

- Coring of turf in spring helps prevent the formation of hydrophobic conditions. Coring doesn't help much after the condition develops.

- Wetting agents are essential. Hydrowet or Aqua-Gro watered in at once work well.

- Improved wetability may last from one to three years.

Conference Topics Continued

NEW TRENDS AND RESEARCH IN TURFGRASS CULTURE Continued

Oil Spills

- Gasoline, motor oil, hydraulic fluid, brake fluid and grease are spilled from time to time on fine turf. Use of detergents with suds picked up with a vacuum have been effective. Activated charcoal and calcined clays have not been as good.

Putting Green Speed

- The stimpmeter is used to determine the speed of golf greens. This is a good addition to other tools used to evaluate greens. The meter is being used to classify greens as follows:

	Inches for	
	Regular Play	Tournament Play
Fast	102	126
Medium fast	90	114
Medium	78	102
Medium slow	66	90
Slow	54	78

- Turf on fast greens thins out and algae and moss take over because of excessively close mowing.

- When competition develops as to which course has the fastest greens, everybody loses.

- Cultural manipulation of greens, including dew removal, coring, topdressing, mowing frequencies, cultivars, footprints, rounds of golf played, all have an effect on speed. Double mowing of greens does not increase speed much. Wind has more effect than any of the cultural and other factors studied.

Winter Injury

- With winter kill, soil temperature is the cause. This is a low temperature injury to the lower crown. Irrigation in the spring helps keep new roots coming. Cut a longitudinal section through the crown to see if the tissue is brown inside.

- Adjustments for cold hardening off occur at from 55 to 65 degrees F. The following temperature ranges have been correlated with turfgrass growth:

60 - 75° F - Optimum shoot growth;
45 - 60° F - Shoot growth declines;
35 - 45° F - Plants harden;
32 - 35° F - Winter dormancy;
25 - minus 15° F - Low temperature kill.

- Hardening off is accompanied by increases in carbohydrate reserves and a decrease in tissue hydration to 60-65 percent.

- Plant hardiness zones and maps show the location of differences throughout the United States.

- Differences in low temperature kill are often difficult to explain. A green may be OK, while the approach is dead. In this case, the green may be Penncross, which is hardy, and the approach, Poa annua, which is not.

The following differences in cultivar tolerance have been noted:

	OK at Soil Temperature
Penncross bentgrass	- 10
Toronto bentgrass	- 10
Poa trivialis	- 10
Merion bluegrass	- 5
Poa annua	- 5
Pennlawn fine fescue	0
Common perennial ryegrass	5

In general, the bents and Poa trivialis have excellent cold tolerance.

- The question still remains - at what soil temperature can winter kill be expected ? There is no one answer. It depends on:
  - plant hardiness level;
  - degree of hydration;
  - rate of freezing - more rapid, more kill;
  - rate of thawing - more rapid, more kill;
  - number of freeze and thaw cycles;
  - length of time frozen.

Of all these, the hydration level is the most important.

- What can be done ? Check the following:
  - provide rapid surface drainage;
  - provide adequate subsurface drainage;
  - cultivation.

- Soils thaw from underneath where warm soil is located.

- An ice cover will trap water underneath.

- Grass may die from increase in hydration. As crown hydration increases, hardiness declines in late winter and early spring (March). In low spots, where water stands, low temperature kill occurs because of water standing.

NEW TRENDS AND RESEARCH IN TURFGRASS CULTURE Continued

- Prevent low temperature kill by checking the following:
  - use moderate nitrogen;
  - use high potassium;
  - cut higher;
  - eliminate thatch;
  - avoid excessive irrigation.

For bluegrasses, use more potassium to balance increased nitrogen - 2 to 1 or 3 to 2. For bentgrasses, the nutrition is not as important because these grasses have more inherent tolerance to cold.

- For bluegrasses, cutting heights of from one and one half to two inches is usually good. More carbohydrates accumulate and there is more biomass. Crowns are protected because of greater insulation.

- The principles are the same for warm season grasses. More winter kill is observed at low mowing heights.

- More winter kill is often observed where herbicides are used - particularly the pre-emergence type.

- Thatch raises the crown above the soil. Thatch also holds water and increases the hydration level.

- Leave aerification holes open to prevent low temperature kill.

- Never let an ice sheet stay on the alfalfa more than twenty days for it dies of suffocation. Injury from ice on turf is not due to suffocation, but to the probability of increased hydration. May remove ice and get winter kill from desiccation, or leave it on and get winter kill from crown hydration. Bentgrasses, bluegrasses and Poa annua have been kept in ice for as long as seventy five days with no injury. At ninety days, Poa annua dies. Bentgrass and bluegrass have survived up to 150 days in ice.

- Traffic on frozen slush injures turf. This pushes water into the crown area and increases hydration so that low temperature kill is realized. Snow mobiles cause no injury to the turf as long as there is one inch of snow cover. Snow mobiles on frozen slush cause increased low temperature injury.

- Another type of winter injury is caused by winter desiccation. During dry, open winters on sandy soils, turf injury may be significant. This type of injury is of less importance than low temperature kill.

- Grasses that are more salt tolerant are also more tolerant of desiccation. For example, Seaside bentgrass. Thus, cultivar variation does exist.

- Higher rates of nitrogen in the fall favor winter desiccation injury.

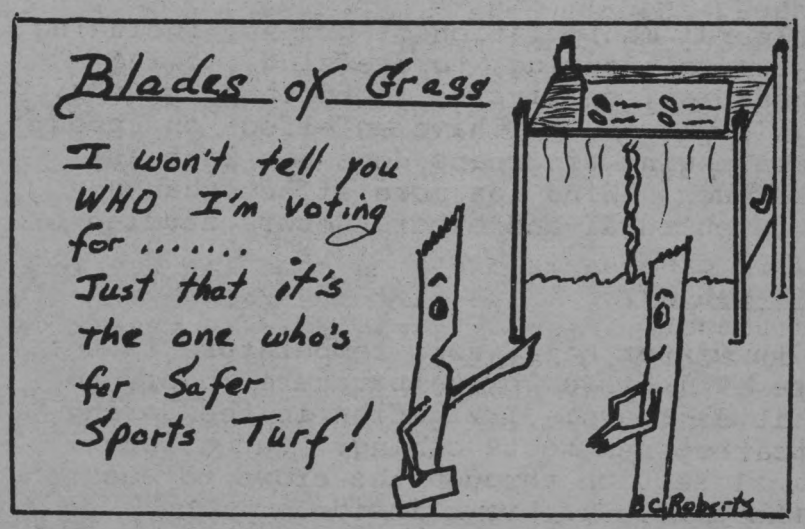
- The presence of thatch increases the likelihood of winter desiccation.

- Open aerification holes favor the development of winter desiccation injury.

- Covers protect turf from adverse winter conditions. Fungicides help prevent winter diseases.

- Soil warming also prevents injury from low temperatures.

- Desiccation affects the crown meristematic tissue. The crown must survive if the plant is to live. Cells in the lower crown are larger. When they are killed, roots are dead. Tops may be alive. If roots are not regenerated quickly, tops will also die.



14th Annual Turfgrass Conference University of Georgia
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Using Fungicides in Lawn Care

Dr Bobby Joyner

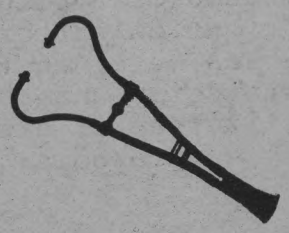
ChemLawn Corporation
Columbus, Ohio

Use of fungicides by professional turf managers has improved the quality of sports turf, particularly golf greens, to a significant extent. How do these practices apply to lawn care ? Dr Bobby Joyner makes the observation that the chemicals work if applied properly at the right time and frequency. But, lawn care presents new requirements. For example, fungicide data for golf greens do not always fit in a lawn situation. Number of treatments will be different. Prediction of when and where the disease will develop is more difficult. The fungus does not always cause infection when proper conditions develop. For example, Rhizoctonia brown patch is active at temperatures from 75 to 85 degrees F under moist conditions. From April to October the potential for infection exists. The disease does not always develop.

Diagnosis is not an easy matter. Symptoms are watched for - circular patches, light brown, varying in size, presence of leaf lesions. Not all brown spots are caused by disease. Usually the symptoms are not observed during development. Only the final condition is noted. Actually, it may be drought stress, not disease. If this is the case, water is needed; if it is disease, watering may cause the increased spread of the infection.

Usually disease is minor on home lawns. Most often causes of brown turf are related to other conditions. In order to be certain that a fungus is active, diagnosis must involve a knowledge of host symptoms, time, precise environmental conditions and actual pathogen indentification.

Disease control starts with the proper selection of grasses, involving types and cultivars. Establishment and management practices are important. Use of the right fungicide applied properly when needed is the final step in disease control.



How early the fungus activity is noticed and its proper identification make the difference between success and failure in disease control. Late applications of fungicide do not bring back dead turf; they only help in preventing spread of the disease. Local, state and regional recommendations help in the selection of the proper fungicide. Use one that fits the local conditions best. This will likely be a material with a longer residual tailored for lawn care use. Repeat applications are usually necessary even though this is costly. The equipment (truck) itself costs close to $35,000 plus the time of the operator and the cost of the fungicide. Customers must be kept informed of what is being done and what to expect. Applications of fungicide made on a service call basis are more readily justified than those programmed ahead of time. These work best on the following diseases:

- Pythium;
- Helminthosporium leaf spot;
- dollar spot;
- brown patch;
- gray leaf spot.

Control of spring dead spot, nematodes, white patch and fairy rings are generally more difficult.

Diseases are not a major problem in home lawns. They rank third behind weeds and insects, but when present, good lawns can be ruined in a short time.

Thatch Characteristics & Turf Management

Dr Kurt Hurto

ChemLawn Corporation
Columbus, Ohio

When lawngrasses are subject to intensive management and decomposition of foliage and stem residue is suppressed, thatch formation is often the result. Dr Kurt Hurto recognizes different approaches in the characterization of thatch and in dealing with it. The following points are well worth considering:

- Bahiagrasses, centipedegrasses, turf type tall fescues, and perennial ryegrasses do not create thatch.

- Thatch is a management issue. Overcoming thatch is a matter of selecting the right cultural practices for the prevailing conditions.

Conference Topics Continued

Thatch Characteristics & Turfgrass Management Cont

- Consider the turf profile. Many consider thatch as a matter of degree. By definition, one quarter inch of thatch is needed and considered advantageous. Many improved cultivars grown in intensively maintained environments have been developed to produce this amount of thatch.

- Thatch formation elevates the turf above the soil. As this is done, roots develop in the thatch and not in the soil.

- Leaves, tillers and rhizomes serve as media for the colonization of organisms, both micro and macro. A micro canopy develops as nutrients leach from leaves and various end products of decay accumulate. Thatch forms.

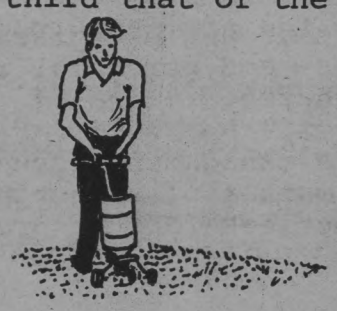
- In effect, a balance develops between several growth and cultural factors. Plant growth rate, resistance of residues to decay, toxic substances, fertilization, soil pH, and mowing all affect this balance and determine the degree of thatch formation. A stationary or steady state indicates that the existing level of thatch is not changing.

- The following relationships generally hold:

  - Increased thatch at higher cuts;
  - Less thatch with more nitrogen;
  - Increased thatch from use of pesticides because of reductions in organisms; fungicides increase thatch;
  - Earthworms work to reduce thatch where soils are light to medium in texture with pH from 5.4 to 7.0 and moisture levels from 12 to 30 percent and temperatures above 50 degress F ($10^{o}C$).

- Thatch may exist as an organic deposit over soil or with soil infused throughout. The important question concerns whether the lawn is grown in soil or in thatch.

- The bulk density of thatch is less than soil. Thus, compaction and water movement from coarse to fine pore spaces become of critical importance. Water may not move down because of hydrophobic conditions (dry thatch is hard to wet) or it may move down but not up. Thatch has a low moisture holding capacity compared to soil and nutrients leach readily from it. The cation exchange capacity of thatch is low when calculated on a volume basis - about one third that of the soil.



- Lawngrass pest pressure develops in thatch. Pesticides are often less effective. Chemical degradation is faster in thatch; movement through thatch may be more rapid. Insecticides for grub control must reach the feeding area in the proper concentration. Thatch interferes with this process.

- Thatch prevention is a matter of reviewing current practices. Is management right for the grasses involved ? Check the following:

  - Slow release fertilizers release nitrogen for most effective thatch control;
  - soil pH of between 5.8 and 6.5 is best for thatch decomposition;
  - light, verticle mowing on a frequent schedule is important for thatch prevention; timing is important;
  - core cultivation or aeration is important particularly as a curative practice; this brings up soil and cuts it in, much the same as an earthworm; water penetration is enhanced; wetting agents assist in this process;
  - thatch modification, through core cultivation and topdressing, changes the physical and chemical nature of the layer; turfgrass growth is improved.

THE LAWN INSTITUTE

SPREADABILITY OF HOMOGENEOUS & BLENDED FERTILIZERS & COMBINATION PRODUCTS

Dr Keith Karnock

University of Georgia
Athens, Georgia

Turfgrass fertilization involves a knowledge of kind of material, particularly in relation to qualities of slow release or fast release, and in addition, related rate and time of application. Keith Karnock also suggests that method of application, which influences distribution patterns, has been overlooked. He has outlined the following points of importance in understanding variability in fertilizer application from centrifugal spin type spreaders:

Conference Topics Continued

Spreadability of Homogeneous & Blended Fertilizers and Combination Products Cont

- There are two basic types of fertilizer formulations. These are,first, homogeneous types in which nitrogen, phosphorus and potassium are part of each particle. Essentially each particle is the same. Second, there are physically mixed or blended types in which nitrogen is on a separate particle from phosphorus and potassium is contained on a particle by itself.

- Sizes of particles are different in many instances.

- When spinner type spreaders are used, homogeneous materials spread evenly, but blended materials may be unevenly distributed.

- Large and heavy particles travel further than small and light particles. This results in a lack of uniform distribution.

- A comparison of various fertilizers, with and without pesticide additives, has demonstrated most uniform distribution from homogeneous fertilizers and least uniform spread from physically mixed fertilizers with chemical additives.

- Little observation of ununiform distribution has been noted in field applications. Nitrogen produces most pronounced turfgrass response and nitrogen is usually more uniform in particle size and weight than phosphorus and potassium. Thus, lack of uniform applications of phosphorus and potassium are masked by nitrogen response.

- The existence of a narrow particle size range is more important than whether the material is homogeneous or physically mixed.

- Segregation of particles may take place before the material ever hits the spinner. Fine materials may settle to the bottom of the spreader because of vibration. This could cause more fertilizer or pesticide to be applied at first with less applied later.

- Some segregation of particles may take place in the container prior to spreading.

- Wind velocity also affects uniformity of distribution from spinner type spreaders.

Annual Conference of the

Tennessee Turfgrass Association

Constructing Athletic Fields

Dr Tim Bowyer

Sunbelt Seed Inc
Tucker, Georgia

Athletic fields that receive a lot of play must be well constructed in order to have any chance for turf persistence. Many fields are used for football, soccer and as general playgrounds. As many as thirty games per season plus soccer are often scheduled. Type of game influences the development of wear patterns. In football, damage is greatest in the center of the field. Soccer play is dispersed over the field with a foot drag type of damage that is different from football. Tim Bowyer has wide experience in the construction of sports fields and lists the following tips as worth considering:

- Because fescues are coarser and more clumpy, Tifway (419) and Tifway II bermudagrasses are being used in warm regions of the country for soccer.

- Tifway II is more dense.

- Zoysiagrass is not recommended. It is too slow to recover from injury.

- Common bermudagrass (seeded) is more open, less dense and has a coarser texture. U-3 bermudagrass is somewhat less coarse than common.

- Midiron bermudagrass is good for sports fields.

- Changes in field conditions affect the psychology of the players and thus these changes are important in the overall play of the game.

- Fields are softer after reconstruction.

- Well turfed fields have a pleasing appearance and are safer to play on. Uneven fields with pot holes are dangerous.

- Play fields get traffic all the time; middle portions get most wear. Play is always concentrated on worn parts of the field.

- Water always runs down hill so it collects in the worn parts of the field.

Conference Topics Continued

CONSTRUCTING ATHLETIC FIELDS **Continued**

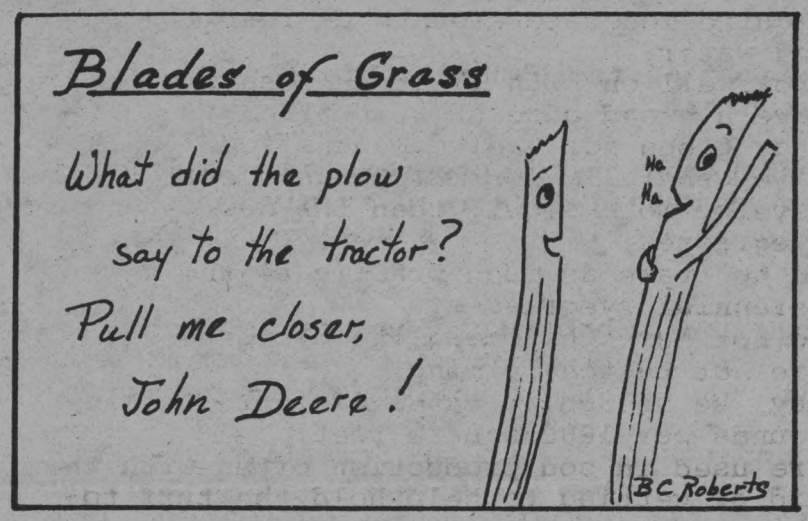
- In order to correct poor field conditions, it is necessary to plan ahead and keep detailed records of all that is done. Without this, improvements are difficult to come by.

Consider these matters:

- know what's under the field;
- remove any foreign debris from under the field;
- put in drain tile around the field;
- run drain lines the length of the field; large equipment is required to do this;
- use crushed rock to provide a four inch base for drain lines;
- grade the field so that water moves from center towards the end zones as well as from center to side;
- irrigation systems are a must; design so that the entire field can be watered in thirty minutes. Keep irrigation nozzles off the field; irrigation is not a luxury;
- sand will take water at a rate of eight to ten inches an hour;
- add peat moss to the sand and get infiltration rates of four to six inches an hour;
- sandy fields like this can be made firm if sod planted on them is grown in sandy soil;
- sodded fields are ready for play in four weeks;
- a football sized field takes about five days to lay the sod;
- sod is topdressed to fill in where shrinkage takes place;
- a bermudagrass sod will have four to six inch roots in two weeks;
- watering starts as soon as the sod is in place; care is taken not to overwater;
- before grassing, the field is watered well to settle the soil;
- where fields are sprigged, take care that irrigation doesn't separate organic matter from the sand and leach away nutrients;
- from five to ten bushels of sprigs per 1,000 square feet provide reasonable establishment.

Field maintenance should emphasize the following:

- Keep the grass well fertilized - have soil test made;
- Topdress regularly. This should not take longer than forty five minutes for a football sized field. A light dressing frequently is desirable. Use same soil mix as in the root profile. Drag topdressing in;
- Core cultivate to keep the field in good condition with roots deep and foliage dense.



Tall Fescue Cultivars

Howard Kaerwer

Northrup King Company
Minneapolis, Minnesota

Fine textured tall fescues are of increasing interest for lawns. The successful use and acceptance of Kentucky 31 fescue throughout much of the transition zone has pointed the way towards development of improved tall fescue cultivars. Howard Kaerwer has had a wealth of experience with these grasses and emphasizes the following points in discussing their use -

- Kentucky 31 fescue is excellent for erosion control.
- New turf type tall fescues are now available (some ten on the market) with seed supply being on the short side.
- New turf type tall fescues are more dense, have better color and are more disease resistant than the old types.
- Future developments will feature narrower leaves, shorter leaves, more uniformity, slower growth rates, darker green foliage, more shade tolerance, greater persistance to reduce tendency to clump, improved creeping growth habit.

TALL FESCUE CULTIVARS **Continued**

- Current turf type tall fescues:
  - establish a little slower than Kentucky 31 fescue;
  - do not have consistant wear tolerance;
  - are drought tolerant by virtue of deep roots;
  - require moderate amounts of fertilizer and water;
  - grow well on both light and heavy soils;
  - have a broad base of adaptation;
  - stay green for twelve months some years;
  - have generally low maintenance costs;
  - develop more slowly than the new perennial ryegrasses;
  - do not take as much traffic as the new perennial ryegrasses;
  - do not have rhizomes like bluegrasses;
  - are not thatch forming;
  - may be seeded at rates of four to five pounds per 1000 square feet;
  - are used in sod production often with the aid of netting to help hold the turf together;
  - are used by landscape contractors for reseeding lawns following renovation with Roundup ®;
  - can be clipped at one and one half inches;
  - respond well to fertilizer applications in December with a lighter treatment in May.
- Research started fifteen years ago on development of the new turf type tall fescues. Four years ago the first cultivars were released for use on home lawns, school grounds, lawns for commercial and public buildings, and athletic fields.

GRASSING WITH MINIMUM INTERFERENCE

Dr Tim Bowyer

Sunbelt Seeds Inc
Tucker, Georgia

Continuing use of sports fields often dictates that improvements in turf quality must be accomplished during periods of active play. Minimum interference with play is expected. Tim Bowyer's experience has demonstrated the following points.

Needs for Grassing

- Convert cool season turf to warm season turf.
  - May rowplant Midiron or Tifway bermudagrass or zoysiagrass to convert golf fairways from bluegrass to a warm season type.
  - May rowplant an improved bermudagrass to convert golf fairways from common bermudagrass.
- Keep bermudagrasses out of golf course roughs - use turf type tall fescues.
- Meyer zoysia fairways can be excellent at times when play is heavy.
- Golf fairway reseeding may amount to costs of $5,000 to $7,000 for repair of fairway damage.

Requirements

- Must have irrigation for hybred bermudagrasses.
- Know potential for winterkill. Midiron is generally winter hardy in the transition zone. Vamont has been winter damaged in the Washington DC area;
- Both cool and warm season grasses are subject to late winter kill. Cold air and dry winds cause desiccation and sublimation, particularly where grasses are close clipped. Winter traffic on the turf often increases damage. Slopes are particularly subject to injury. Any weakened turf may suffer. Spring is the time to work the soil for good sprig beds.
- Cut slits, plant and irrigate. Minimal traffic is desirable following this.
- Grass will need attention for four to six weeks following planting. This is not difficult when good soil to sprig contact is achieved and when good fresh sprigs are used.

Conference Topics Continued

GRASSING WITH MINIMUM INTERFERENCE **Continued**

- In advance of row planting, eliminate weed competition with Roundup, Paraquat or other growth retardants.

- Viable sprigs must not be allowed to heat up. Keep in the shade until planted. Maintain moisture level between dry and wet (damp). From time of harvest to planting should be within two days.

- Row planters that have cutting discs permit sprigs to fall into slits. A foot behind the disc pushes the sprig into the slit and presses soil around it by pulling the furrow together. Part of the sprig is left above ground. Six row planters work well. Sprigs are placed from six to twelve inches in the row. Planter maneuverability presents some limitation. Major changes in slope and rock can be troublesome.

- Debris is left in place. Care must be taken to not pull out new grass in any attempt to move debris.

- Furrows are sealed by rolling. The vegetation above ground dies while the roots live and develop new shoots.

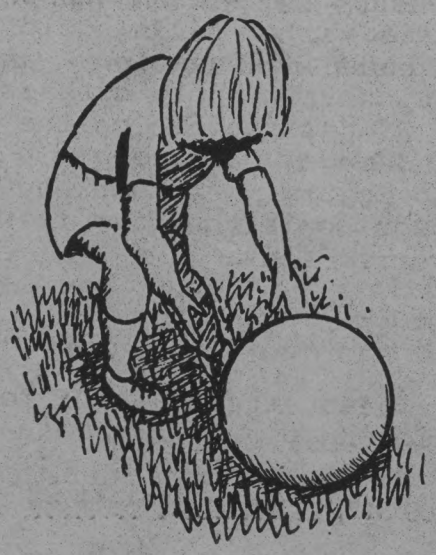
- As grass develops green tracks will be observed . Early morning dew collects on these and they are easy to spot.

- Sprigs may be harvested year round even when grasses are dormant.

- Zoysia rhizomes are very hardy but it takes three to five years to establish zoysia from sprigs.

- Bermudagrass establishes in ten to twelve weeks.

- Row planting is an option in the establishment of vegetative material. It is not an inexpensive operation.



53rd Massachusetts Turfgrass Conference & 8th Industrial Show

Diagnosing Lawn Problems

Maria Cinque

Nassau County Cooperative Extension Service
Plainview, New York

Diagnosis of lawn problems is never easy. It involves a certain amount of detective type work and the development of analytical thought processes. Maria Cinque's experience in diagnosing lawn problems has convinced her that the following points are of importance in developing a high degree of competency.

- Don't eliminate any possible cause from consideration. It may be insects, disease, nematodes, weeds, cultural conditions or vandalism.

- Use all tools available including books, bulletins, diagnostic services and other Cooperative Extension aids. Of special value are pictorial guides. These may be placed on the ground so that pictures may be compared with the actual condition. Get a copy of the guide released by Cornell University.

  Picture Clues to Turfgrass Problems
  by A Martin Petrovic
  Maria T Cinque
  Richard W Smiley
  Haruo Tashiro

  Miscellaneous Bulletin 125
  Distribution Center
  7 Research Park
  Cornell University, Ithaca NY 14850

- In order to determine if the condition is disease, ask these questions:

  - Since disease identification cannot be made by telephone, when can I see the site or when can a specimen be brought to the office ?

  - What are the causes of leaf lesions ? What lesion patterns are formed ? Do I have proper magnification to be certain ? Is it leaf spot ?

  - Is there a banding on leaves ? Is there a cottony growth around plants in early morning ? Is it dollar spot ?

Conference Topics Continued

DIAGNOSING LAWN PROBLEMS **Continued**

- Is there a doughnut blighted area ? Are leaf lesions irregular ? What cultural practices have been used ? Is it fusarium blight ?

- When wiped with a clean cloth is there a gray residue removed ? Are veins black ? Is it stripe smut ?

- Is there a dark smoke-like ring around the blemish in early morning ? Is it brown patch ?

- Are there irregular gray masses of fungus on leaf and stem surfaces ? Is it slime mold ?

- Are there toad stools or mushrooms present in a circle or arc ? Is it fairy ring ?

- In the determination of insect injury and in the identification of pests, a hand lens will be needed. Chinch bugs are very small. They float to the surface when a sod sample containing them is immersed in water. Grubs are larger and can be observed without magnification under sod which often lifts easily because of severed roots. The presence of bird, mole and skunk activity signals the existence of grubs in a lawn. Sod webworms damage lawns following activity from a slender moth that lays eggs in the lawn. To help distinguish between insect injury to lawns and a variety of other conditions, ask the following questions:

- When did the condition occur first ?

- Is there any relationship to applications of water and fertilizer ?

- What were the early symptoms like ?

- Are pictures available showing the development of the injury ?

- Are there distinctive leaf lesions ?

- Are there patterns of damage across the lawn?

- What other plants are affected - shrubs ? weeds ?

- Could an herbicide or something else have been spilled there ?

- What grass or grasses are affected ?

- Are the grasses not affected generally healthy ?

- Is there adequate light ?

- How do the roots look ? How deep ?

- To what uses is the lawn put ?

- Is this clumping of tall fescue ?

- Is this patching of bentgrasses ?

- Is this mower injury from scalping or from use of a dull mower blade or improperly adjusted machine ?

- Is this crabgrass completing its life cycle the first of October ?

- How old is the lawn ?

- Was the lawn seeded or sodded ?

- How was the lawn seeded or sodded ?

- What is the soil type ?

- Is there thatch above the soil ?

- How often is the lawn watered ?

- What type of irrigation system is used ?

- Is watering considered a status symbol ?

- How much water is applied ?

- What has the temperature been ?

- How much rainfall has there been ?

- How well does a specimen from the lawn represent acutal conditions ?

- Has a complete and accurate account of actual conditions been given ?

- How often is the lawn mowed ?

- What is the height of cut ?

- Are there rocks or other hidden material under the turf ?

- How much fertilizer is used ?

- When is fertilizer applied ?

- Is slow release fertilizer used ?

- What method was used to apply the fertilizer ?

- Were there overlaps or skips ?

- Was any fertilizer spilled ?

- Could vandalism have been involved ?

- What pesticides have been used - what rate ? - when- how applied ?

- Finally, when all aspects of the condition have been considered, an accurate diagnosis will lead to a prescribed method for control.

COMPACTION EFFECTS ON NITROGEN FERTILIZATION

Dr Robert N Carrow

Kansas State University
Manhattan, Kansas

Athletic fields are especially subject to soil compaction because unique traffic patterns characteristic of soccer, football and golf from tee to green. This in turn produces a soil compaction induced stress not found in home lawn turf. Not only is there wear of the turf from abrasion and rutting, but also roots are affected as soil physical properties change to restrict movement of air and water. From six to twenty pounds per square inch of turf surface affects soil down to an inch or so. Roots must grow into and through these unfavorable soil conditions.

Robert Carrow has studied effects of soil compaction and nitrogen fertilization. He has evaluated gas exchange (oxygen in and carbon dioxide out) in relation to bulk density (indicating hard soil with less air). His observations include the following.

- Applied nitrogen alters soil nitrogen activity (movement of nitrogen). Nitrate may change to nitrite which may be changed to nitrogen gas or nitrous oxide, both of which are lost in the denitrification process. One to two pounds of nitrogen per 1000 square feet a year may be lost in this way.

- In waterlogged or compacted soil, nitrate should accumulate in the topsoil.

- Water does not readily enter compacted soil thus runoff is promoted.

- Dryer soils have a reduced rate of nitrogen release. Slow release nitrogen carriers, such as Milorganite, sulfur coated urea, ureaform and IBDU have even a slower release rate.

- Nitrogen alters shoot and root response when soils are compacted. Shoot growth rates are reduced. Clipping yields and shoot density are consistent with those of slower growing plants. Plants not growing need less nitrogen. There are fewer plants per square foot (from 131 to 162 shoots per 100 square centimeters). Soil compaction alters root distribution and vitality. Roots need oxygen to respire. As respiration slows, roots lose vitality.

- A lack of soil air causes roots to absorb less nutrients, particularly nitrogen - a thirty percent reduction in nitrogen use per unit area. The roots either can't get the nitrogen or the plants can't use it. Recovery of applied nitrogen is often reduced under soil compaction by from ten to thirty percent.

- With compacted soils there are more surface roots and fewer deep roots.

- Nitrogen use efficiency is less when soils are compacted. When excessive nitrogen is applied, the nitrogen use per unit area of turf increases but the nitrogen use efficiency declines. This not only wastes nitrogen, but reduces root growth forty to fifty percent.

- Addition of more water on compaction makes things worse. In order to correct the condition, the soil must be dealt with. Traffic control helps - as does soil cultivation and soil modification.

- Mechanical practices, such as coring, grooving, slicing, forking, spiking and subsurface cultivation, help to relieve soil compaction.

'When tillage begins, other arts follow. The farmers, therefore, are the founders of human civilization'

– WEBSTER

Conference Topics Continued

IRRIGATION SCHEDULING

Dr Robert N Carrow

Kansas State University
Manhattan, Kansas

Efficient use of irrigation water requires careful determination of the frequency of application. In Kansas, Robert Carrow has observed periods of some two months with no rain and nearly half the time with daytime temperatures in excess of 100° F. Irrigation research has increased knowledge of how to handle these situations. The following tips have been found helpful.

- A reduction of irrigation frequency saves labor, reduces weed populations, helps control diseases.

- In order to tell when to irrigate,atmospheric, soil and plant factors must be considered. Frequency and rate of application, as well as uniformity of application influence the amount of water needed.

- A good well designed system will tell when to start irrigating and when to stop. In making these determinations, the system, the soil, the plant and atmospheric conditions are all known. The objective is to maximize input with minimum output and maintain opimum reserve moisture.

- Natural precipitation plus irrigation water should provide sufficient for capillary movement as surface soils dry.

- Evapotranspiration, runoff and leaching should account for all water lost above the reserve level. Soil texture, root depth, and the existence of perched water tables or drainage barriers influence the amount of reserve at any given time.

- Monitoring of soil moisture status, atmospheric demand and plant response requires experience. Several different techniques are used:
  - feel of the soil;
  - appearance of the soil;
  - resistance of soil to a probe;
  - tensiometer readings;
  - electrical block readings;
  - electrical resistance probe readings;
  - heat dissipation sensor readings;
  - neutron probe readings;
  - neutron probe readings;
  - Gamma ray attenuation readings;
  - soil psychrometer readings.

All these systems have limitations.

- A new method for monitoring soil moisture involves time domain reflectrometry (TDR). This could be most useful if proved economical.

- A knowledge of soil texture provides information on how much moisture is in a soil as reserve. The goal is to replace what the plant uses.

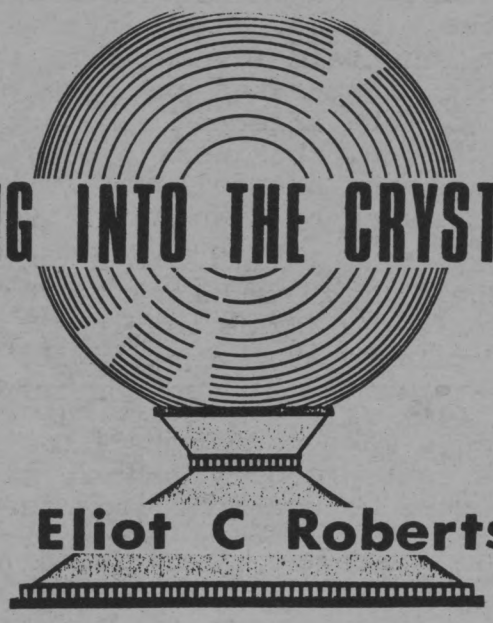
- Eighty to eighty five percent of pan evaporation moisture is used by the turf.

- Check turfgrass response by visual observation of wilt, footprinting, development of blue-green foliage, appearance of indicator spots or patches in a turf sward.

- Leaf water potential is a stomatal response correlated with infrared thermometry. This gun-like device measures canopy temperature accurately. Well watered turf maintains a temperature about the same as the atmosphere. As moisture in the soil decreases, canopy temperature increases. The canopy temperature reflects the influence of soil, plant and atmospheric conditions. Measurements are recorded from several different locations. Time of measurement should be the same every day (1:30 PM). Stress degree days are calculated. Irrigation is scheduled following an accumulation of ten to fifteen stress degree days.

Director's Dialogue

(Editorial type commentary)



LOOKING INTO THE CRYSTAL BALL

by **Eliot C Roberts**

Of prime concern to all of us is the question, what does the future hold for me, my close friends and associates interested in landscape horticulture ? Many of the best selling books today deal with this topic. For we live in a world of constant change and must be aware of how best to manage change as we prepare for the future. This was the keynote topic discussed by Dr Leon Martel, author and futurist, at the 1984 Golf Course Superintendents Association of America International Turfgrass Conference in Las Vegas.

According to Dr Martel, a strategy for meeting challenges of the future must involve the development of a new attitude on our part. It is a matter of being oriented to the future, of thinking in terms of the future. Consideration of golf courses on the moon may be risky, but necessary. The degree of stability in the past that has served to slow the rate of change has lessened. Forcasters of the future are attracting attention by proposing questions in need of new answers.

The notion that if we wait long enough for the future, it will come, like it or not, is open to built-in hazards. It is possible to wait so long that it will be too late to have a constructive influence. Opportunities are ours to know much about possibilities for the future, if we are willing to take a long term view ahead. It's true that this is rarely done.

It's most comfortable to view the future as a continuation of the present. In a way it is, but in terms of change, new worlds of opportunity open rapidly as old ways crumble about us. We tend to be comforted by the feeling that present trends will continue. Population increase trends have pointed the way towards a future of gloom and doom. Without limits on growth, disaster is ahead, and yet, disaster is not a new experience as history so well demonstrates. Patterns of change can be evaluated and used to help point the way ahead.

Dr Martel has identified four areas of critical importance in trying to manage the future and cope with change. These are: Information, Population, Natural Resources, State of the Economy.

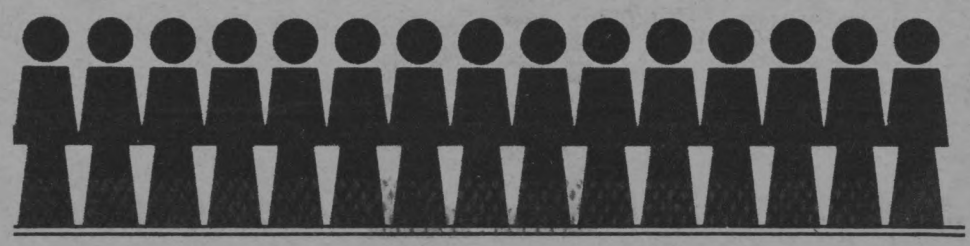
Information: Labor and energy have been key forces in determining the future through years past. Now, information is likely to be of increasing importance. New application of information will transform old things to new items of increased value. Turfgrass management requires new information in order to keep track of all that must be done to assure the availability of high quality turf. Business management requires new processes for collecting and analyzing data and for handling a wealth of information necessary for efficient operation. Computers will do more and more for the turf manager.

A revolution in lawn care is just ahead through use of new grasses developed through genetic engineering, featuring an improved heredity and bordering on super strains. These developments will be aided by information management at the computer level.

Population: Population growth has been a feature of humankind for thousands of years. The rate of growth has slowed some towards the close of this century. With greater prosperity and affluence, growth rates decline. Family planning has had an influence. It now appears that the peak growth rate (1975) has been reached and a world wide slow down is underway. A one percent a year increase in growth rate should be reduced to zero by the turn of the century.

Life expentency in the United States, now at 74.5 years, continues to increase. Improvements in the prognosis for survival of both children and senior citizens will increase prospects for life to 80 years and perhaps even to 95 or 100 years. Thus, even with a slowing of the birth rate, longer life expectency will bring about population increases.

More senior citizens, characteristically interested in lawns and gardens and benefited by the type of physical activity associated with golf, will place increasing demands in the area of landscape horticulture. Golf course design may feature changes (more par three courses in retirement communities) for older players. Cycles of baby booms and senior citizens will continue within the context of these population trends.



LOOKING INTO THE CRYSTAL BALL Continued

Natural Resources: Availability of energy and the effect of its use on the environment flavor our concern for natural resources. As population trends are better understood, we have improved prospects for dealing with energy issues. Distribution and quality of energy sources are most important. Supply is related to technology, whether thermal, geothermal or fusion. The era of eternal energy is viewed as close at hand. In the meantime, ample natural and renewable resources are available.

These energy related issues, governed by well understood economic principles are never-the-less highly complex. As costs of energy increase, the consumer conserves. Thus, higher prices create surpluses. At the present time there appears to be plenty of nonrenewable resources to last until technology has advanced adequately for the utilization of new sources of energy.

With water, very little is ever lost and only a small portion of the total is used (something like 1.4 million million gallons a day). Distribution of water is a serious limiting factor. Weather cycles result in surpluses in some areas and shortages in others. Irrigation management will be important in the future. Water quality is also of concern as the by-products of civilization intensify ground water pollution.

State of the Economy: There are always more views on the economy than there are economists. We have realized sustained economic growth since World War II. The average family has assets of over $100,000.00. Dollar values and costs are of recognized importance to us.

Now, we are involved more and more in a service economy. Three percent of the work force is on the farm. Twenty two percent is employed by industry and seventy five percent is involved in service related fields. With slower population growth comes a normal slowing in economic growth. The industrial society is no longer a factor. More emphasis is placed on efficiency and quality than on quantity.

There is more discretionary income available to satisfy individual wants, and this permits an up-scaling for many people. Television increases expectations and encourages public demands. Government responds by trying to help meet these expectations. Money and credit are created faster than goods so that inflation results where there is too much money chasing too few goods.

Dr Martel identified three indicators of rising prices. First, high interest rates. The days of long term low interest rates are gone. Double digit rates are likely to continue, but will be affected by short term changes. Second, business cycles influence prices. Downturns are followed by upturns which are followed by downturns. Recoveries are limited by the length of time they can be sustained before the next downturn. Changes often follow elections and are thus influenced by political forces. Third, large and continuing deficits affect prices. Governments that rely on a continuation of the past without change make commitments for future generations that are difficult to meet. Burdens for future generations grow faster than any reasonable expectation for their resolution. Chances of cutting or eliminating programs once established are few and far between.

Increasing taxes are never popular. Only through election of new legislators, who have a better appreciation of the future. are more responsible fiscal policies likely to be realized.

Conclusions

It is necessary to adopt a long term perspective with regard to the future. This should not be an extrapolation of the immediate, but should encompas different outlooks, challenges, and opportunities. The future should come about, then, by design and not by default.

Change must be understood for what it is and not ignored. An alteration of present conditions should not be feared. Such changes provide opportunity. For these changes to be beneficial, they must be hooked up to, related to, or made functional in some way.

Emphasis must continually be placed on the unique contribution lawns and sports turf make to our way of life. Health and physical fitness are related to out-of-doors activity. Golf is one of the few sports not dependent on a clock. It lends itself to recreational needs of senior citizens. Landscaping enhances environmental quality and is friendly to both the developer and natural systems. Tranquility thus created is an asset for all humankind. A pause that refreshes and renews the spirit in the midst of life at its best in the fast lane.

Thus, the crystal ball shows change to be a cause for opportunity; not a cause for concern.

Field Day Score Card

(Field Plot Evaluations)

Harvests 16

University of Rhode Island Turf Research Field Day

August 22,1984 marked the fifty third time that turf research plots at the University of Rhode Island were used as an educational feature in reporting the latest lawn and turfgrass findings. Nine members of the University faculty contribute to team approach to turfgrass research. They are:

C R Skogley - Applied management, selection and breeding ; Soils and turf relationships
J A Jagschitz - Weed control and growth retardation
D T Duff - Turfgrass physiology and stress
R J Hull - Turfgrass physiology and nutrition
R C Wakefield - Turfgrass ecology
B D Kim - Plant improvement and genetic engineering
C G McKiel - Agricultural engineering
N Jackson - Turfgrass pathology
A J Gold - Soil physics and hydrology

The following brief statements identify thirteen investigations open for inspection and discussion during the recent field day:

National Kentucky Bluegrass Trial - C R Skogley

This is the first turfgrass variety trial that is national in scope. The 84 entries of varieties and experimental selections are in trial at many locations throughout the United States. The study is sponsored by Agricultural Research, U S Dept of Agriculture and has been coordinated by Mr Jack Murray, Turf Agronomist at Beltsville, MD.

Data collected from a trial of this nature can be summarized at local, regional and national levels and results can be of greater value over wide geographic areas.

National Perennial Ryegrass Trial - C R Skogley

This is our second entry in national trials. These plots were seeded in early October,1982. Some data were obtained in 1983 but this is the first fall year of evaluation. There are 50 entries in this study. Cutting height is at 1 1/2 inches and they receive 3-4 lbs N/1000 annually. Weeds and insects are controlled and the study is irrigated. Most commercial and many experimental turf-type cultivars are included in this trial.

Nutrient Use Efficiency of Turfgrasses
R J Hull and J Cisar

Eight turfgrasses, (Kentucky bluegrass cvs 'Baron' and 'Enmundi', rough stalk bluegrass cv 'Sabre', canada bluegrass cv 'Reubens', red fescue cv "Jamestown', hard fescue cv 'Durar', perennial ryegrass cv 'Yorktown II', and colonial bentgrass cv 'Exeter') are being evaluated for their efficiency in utilizing nutrients from liquid and granular fertilizer applications. Nutrient content of clippings, total plant, soil solution nutrient concentration under sod, and available moisture under sod are being correlated with turf quality. Nutrient absorption properties of grass roots are being determined in the laboratory and these will be correlated with field performance.

Nitrification Inhibitors Applied to Turf -
R J Hull and E Hesketh

This study evaluates nitrification inhibitors,i.e. Dwell and Nitrapyrin, on established Baron Kentucky bluegrass. By inhibiting the microbial oxidation of NH_4+ to NO_3-, three advantages can be achieved. The first is to reduce N leaching from the root zone, thus reducing N loss to the turf. Secondly, to reduce groundwater contamination by NO_3- leaching and lastly to decrease the energy needed to metabolise N. The plots used for this sutdy are managed under four nutrient combinations, N, NK, NP and NPK and 3 rates: high, medium and low. The inhibitor was applied to the east half of each plot. To determine the effectiveness of the treatment,soil water, clipping weights, and the nutrient content of the turf plants will be analyzed.

Evaluation of Growth Retardant Effects on Turfgrass Disease Incidence and Severity -
A Pennucci and N Jackson

Areas of 'Touchdown' and 'Merion' Kentucky bluegrasses and fine fescues were treated with 3 rates of Embark, maleic hydrazide and three experimental compounds, EL 500, PP 333 and M-4621. These compounds were evaluated for their effects on the following diseases : Helminthosporium leaf spot, red thread and pink patch, dollar spot, brown patch and stripe smut.

Field Day Score Card CONTINUED

FIFTY THIRD UNIVERSITY OF RHODE ISLAND
TURFGRASS FIELD DAY **Continued**

Pre- and Post-emergent Control of Crabgrass in Lawn Turf with Herbicides-
J Jagschitz

Trials were initiated on established turfgrass to evaluate pre-and post-emergence herbicides for control of smooth crabgrass. The most desirable means of control is through the use of pre-emergence materials which inhibit seed germination. However, where pre-emergent means are not used, or fail, post-emergent control measures may be necessary.

National Tall Fescue Trial
D T Duff

Tall fescue has not been generally recommended for turfgrass useage in the Northeast, although it has been a common ingredient in cheap seed mixtures for years. The few available varieties have been coarse,clumpy and intolerant of northern winters. In recent years, plant breeders have been striving to develop finer-textured more winter-hardy cultivars. This study includes thirty cultivars, some commercially available and others experimental. The grass does have attributes and is widely used in areas of the United States. We are trying to determine whether some of the newer cultivars might have value in New England.

Evaluation of Experimental Fungicides- N Jackson

For the management of turfgrasses, the agricultural chemical industry is constantly searching for and releasing new, more effective pesticides. A trial area is maintained for the purpose of evaluating experimental fungicides as they are released for testing by the various chemical companies.

Greens Topdressing Study - C R Skogley

One of the most important aspects of greens management is topdressing. The practice is more an art than a science, however, and controversy continues as to what constitutes a proper program. Grasses in this study were seeded in 1974 and topdressing practices initiated in 1976. Data are obtained yearly as added topdresssing (sand and compost) continues to accumulate above the original soil surface.

Evaluation of Flowable Fungicides and Nematicide/Fungicide Interactions -
N Jackson and A Pennucci

A. As chemical companies seek less costly and more efficient means of controlling diseases, formulations used for fungicides are under investigation. The tests in this area include a comparison of wettable powder and flowable formulations as well as fungicides only available as flowable materials.

B. The interactions of nematicides and fungicides are tested here against a variety of diseases, including anthracnose. Two nematicides and three fungicides in various combinations and rates are applied monthly. Area under test in 1982 and 1983.

Evaluation of Commercial Fungicides - N Jackson

These trials are for the purpose of evaluating commercial fungicides for disease control. The materials are applied repeatedly over a number of years.

1979,1980,1981 General Variety Trials

New turfgrass cultivars are being released yearly . In an effort to evaluate turfgrass performance of the new selections, trials are established annually. New selections are compared with standard varieties, usually for a period of five years or longer, before a decision is made regarding the potential value.

Low Maintenance Lawn Study - C R Skogley

The grasses in this study are fertilized only once a year (Sept), receive no irrigation and are mown with a rotary mower. There are 18 Kentucky bluegrasses seeded individually, 3 perennial ryegrasses seeded in mixture at 4 rates with each of 3 Kentucky bluegrasses and 4 fine fescues in mixture at 3 rates with each of 3 Kentucky bluegrasses. Two hundred and seventy plots are included in these studies.

Stand counts and quality data were recorded to determine the competitive performance among the different varieties in mixture and its relationship to turf quality under minimal maintenance.

Additional information and up-to-date results of these studies may be obtained from the appropriate research specialist in care of The University of Rhode Island, College of Resource Development, Kingston RI 02881. This research effort scores high, not only in the northeast region, but also nationally.

Lawn Institute Pitch

(Discussion of Current Issues)

Harvests 18

Aesthetic Environmental Benefits

by

Eliot C Roberts

What is the worth of a lawn ? We measure what it costs to construct. We determine maintenance and renovation costs over the years. We estimate its value in terms of real estate when purchasing or selling a home. But, we also realize that lawngrasses are included among those very important plants that enhance our environment. Lawns contribute to environmental quality in ways we often take for granted. Measures of these types of worth are difficult to come by for environmental quality means more to some than it does to others.

The issue of actually measuring worth of environmental quality and landscape features was researched by A Randall, B C Ives and C Eastman at New Mexico State University in the early 1970s. Agricultural Experiment Station Bulletin 618 "Benefits of Abating Aesthetic Environmental Damage" was released in 1974. This report describes a method for making monetary estimates of the benefits from abating aesthetic environmental damage as perceived by users of the affected environment. This method was tested in an area involving strip mine coal for a steam electric-generating station serving the four corners area of Utah, Colorado, Arizona and New Mexico. Extending this method to learn more concerning the value of home lawns is worthy of consideration.

Degradation of the environment is concerned with only those reductions in quality that stimulate a broad sense of social and political reaction. Examples usually cited include atmospheric pollution, both particulate and gaseous, and aesthetic damage that reduces long distance visibility and depth including color perception. Strip mines and power transmission lines both yield aesthetic damage.

Financial well being of people who value aesthetics is not directly affected by aesthetic environmental damage. The quality of life as perceived by these people is reduced. Aesthetic damage to an out-of-doors environment may diminish the utility of that location to some people. This amounts to the creation of a discommodity. The abatement of the condition is a commodity and should be ascribed worth.

The abatement of any kind of aesthetic damage within a community is classified as a non-market good since it is non-exclusive in benefits provided. It is a public good because benefits are inexhaustible over a wide range of conditions. Additional numbers of people (consumers of the aesthetically improved environment) can enjoy with minimal reduction in visibility or scenic beauty available to each.

Traditional supply and demand curves are not appropriate in the determination of demand for an aesthetically improved environment. The situation is not one where people choose on the basis of price. Instead, people value aesthetics individually following appropriate observation or experience. One person does not exercise any choice over the quantity of the improved environment available. In effect, any quantitative increases available are likely to be more a matter of improved quality.

Difficulties arise in the valuation of aesthetic environmental improvements since there are no observable prices. Outdoor recreation services are often provided by public agencies at prices bearing little relationship to market prices. Thus, it is necessary to measure individual perceptions and consider aggregate benefits for the provision of this public good.

Lawn Institute Pitch

Continued

AESTHETIC ENVIRONMENTAL BENEFITS Continued

Bidding games are used to estimate the benefits associated with improved environmental quality. These games are, in effect, surveys that measure behavioral predispositions of the respondents. The efficacy of this survey technique depends on the reliability with which the respondent's answers to hypothetical questions, predict their ultimate actions should the hypothetical situation become reality.

Willingness to pay is a behavioral dimension of an underlying attitude concerning environmental quality. In this way, the value of environmental improvements to various components of the population may be estimated.

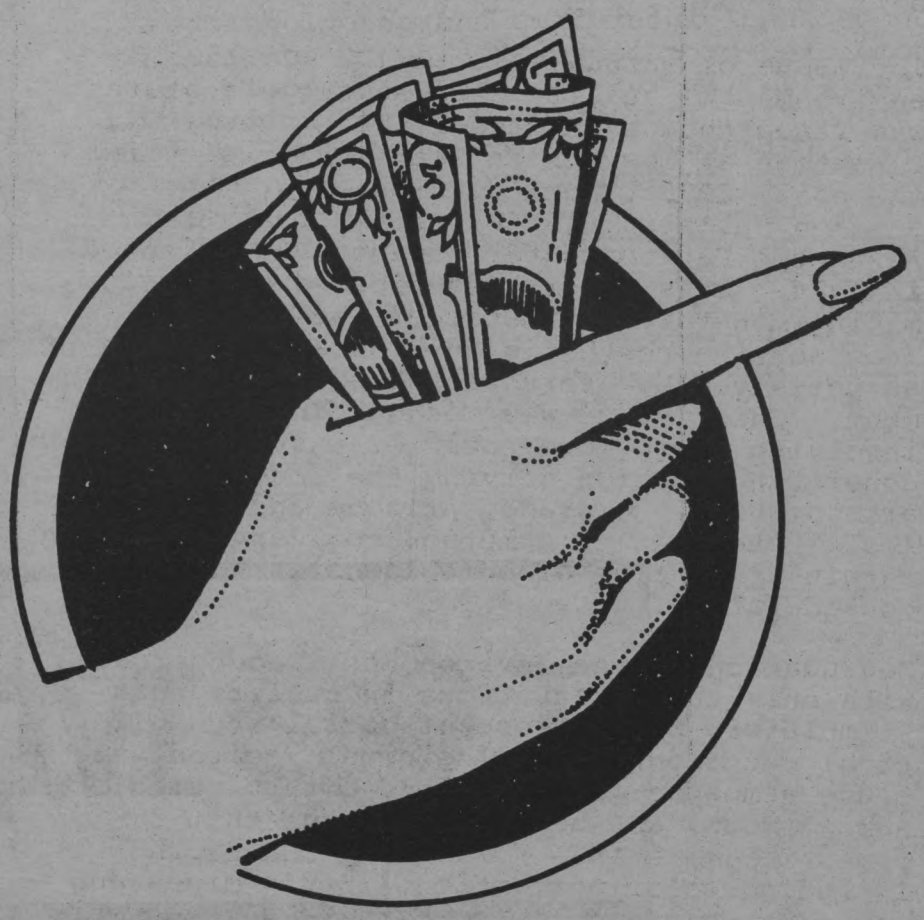
Sociologist and public opinion researchers have developed highly reliable survey techniques for measuring attitudes and their behavioral components. Hypothetical situations presented must be realistic and credible to each respondent. Emphasis is placed on testing items with properties similar to actual situations. Symbolic situations fail to be convincing; they must be concrete. Test items must be concerned with institutionalized or routine aspects of behavior where role expectations of respondents are well defined. For example, willingness to pay additional taxes in some form to achieve aesthetic environmental improvement is affected by attitudes toward the current tax burden. In addition, the fear that some will not pay a fair share and thus function as freeloaders often causes repondents to avoid stating their preferences. Respondents must be convinced that all consumers of these environmental benefits will pay for them on a similar basis.

Bidding games feature a series of questions about environmental matters. These focus attention on the topic. Pictures or sketches are used to show at least three different conditions. First - the greatest damage that might be expected (often the way it was); second - less damage following some effort at improvement of the aesthetic environment (often the way it is); third - no damage to the environment (often the way it could be). These illustrations may show effects of air pollution or spoil banks from strip mines or electric lines or billboards and other litter that detract from aesthetic value of the natural landscape. The ideal landscape is presented in some form as an acceptable, desirable standard.

Each illustration and question related to it must represent a real life experience so that a bid on how much the respondent is willing to pay for improvements will be valid. Specific dollar values are listed and the respondent answers "yes" or "no". Illustrations and questions start with the worst situation and work towards the best. The respondent indicates how much it would be worth to improve the environment from the worst condition to an intermediate condition; from an intermediate condition to the best condition. Visualization of what's involved is important.

Should the respondent not be willing to pay anything, then questions are asked to try to find out why. No bid may mean that there is no perceived value in this aspect of environmental quality. No bid may also be interpreted as an objection to the bidding game as a survey method; in which case, the no bid is recorded as a non-response. Previous explanation to the respondent must make clear the fact that method of payment is not an issue in the bid process. Method of payment is considered through other sets of questions.

Background characteristics of respondents influence the bidding process. It's a fact that people are not accustomed to paying for the abatement of aesthetic environmental damage. They are used to paying for parks and highway beautification that have quality of life or aesthetic components. Respondents must be divided into groups that comprise subpopulations of the affected population. Benefits are often greater for higher income families. Residents of an area may view environmental quality differently than visitors or tourists.



AESTHETIC ENVIRONMENTAL BENEFITS Continued

Several different bidding games have been used effectively to estimate value of aesthetic components of the environment. Sales Tax Games consider funding of environment improvements by adding to existing local or regional sales taxes. Electricity Bill Games assume that power generation is responsible for sufficient environmental degredation to justify costs for improve environmental quality added as a tax on the electric bill. Monthly Payment Games specify no particular method of payment. User Fee Games measure the willingness of recreationists to pay. Emphasis is placed on activities associated with tourists. Funds are collected while people are on vacation at the site. Compensation Games assume that victims of environmental damage ought not be expected to pay costs of abatement. Thus, a measure is obtained of industry responsibility. Industry either corrects the conditions or pays compensation to the affected parties. The amount of compensation that would be accepted in exchange for toleration of the aesthetic environmental damage is a measure of the value of those environmental components affected. Payment is based on ownership or rental of property. In effect, how much would the respondent be willing to accept per month as damage compensation.

Results of the New Mexico study were based on personal interviews and questionnaires completed by some 600 residents and 150 tourists. It was evident that people concerned with recreation were not willing to pay for improved environmental quality (they might well go some place else). In terms of local residents, evidence indicated that the mining and electric generating companies should pay for the abatement of environmental damage as first priority. Following that, the final users of the power have responsibility to pay for an improved environment. All people affected should pay only as a last resort.

Conclusion

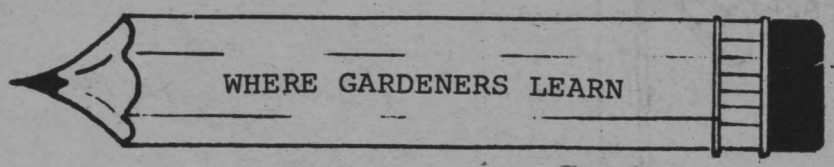
Many of us concerned with landscape quality have an urgent need to better understand the value of the commodity that is our livelihood and promotional mission within the community. We are aware of social and economic forces that cause the deterioration of neighborhoods. Landscape degredation is a feature of these events. On the other hand, we cite examples of neighborhood improvement and describe processes that result in the renovation of lawns, the planting of trees and shrubs and growth of flowers and vegetables. Trash and litter are no longer conspicuous as they once were. It is evident that landscape quality is much more than the dollar value of goods and services.

The time has come for us to look at lawns, gardens, playgrounds, parks, golf courses and open space in ways that will better describe benefits we have almost come to take for granted. What is your bid to live where aesthetic environmental quality is high ? We must find out and then be prepared to meet these future needs.

I ♥ My LAWN

P.O.BOX 108

(Industry Wide News and Views)



According to Nancy Flinn of The National Association for Gardening, 180 Flynn Ave, Burlington Vermont 05401, the sources of gardening information are as varied as the obvious - seed packet data and gardening books to TV, newspapers, magazines and friends. According to the Gardens for All's National Gardening Survey, people use multiple sources for how-to-garden information.

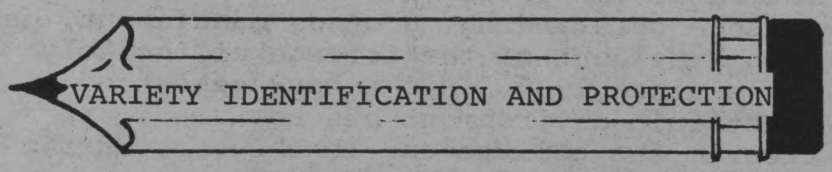
The most popular sources are seed packets, used by 68 % of the nations 35 million gardening households and information included with products at 51 %. These are the only information sources used by the majority of gardeners. Friends at 47 %, newspapers at 43 % and garden books at 38 % follow suite. Magazines are used by 31 %.

What Interests Gardeners

According to the latest National Gardening Survey conducted by the Gallup Organization for Gardens for All, The National Association for Gardening, 60 % of the nations's 35 million gardening households indicated the subject of most interest is weed control.

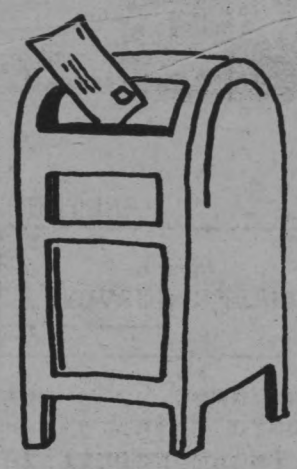
Other subjects of interest to gardeners rank as follows:

- Basic garden care information - 54 %;
- Soil information - 53 %
- Insect indentification/control follows small space gardening at 43 %
- Plant diseases rank next with 39 % of gardeners expressing interest.



James O Anderson, president of Vari-Ident Labs, 4620 E Timrod St, Tucson AZ 85711 (602/327-8254) has had over fifteen years of experience with plant proteins and their electrophoretic separation. He is an established researcher in the field of chemotoxonomy and genetic purity. He has provided the following statement for your information.

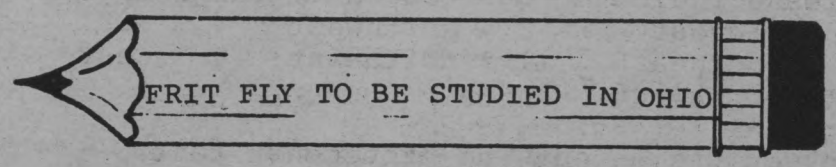
"Your investment in the development and introduction of new and improved plant varieties is substantial. Unfortunately, morphological and phenotypic descriptors are not always sufficient to accurately describe and protect your variety. Electrophoresis of protein and enzymes may provide the additional information that you need as well as providing an element of quality control.



Proteins (and enzymes) can be obtained from almost any plant tissue. We have analyzed proteins from the leaves, shoots, seeds, fruits, roots and pollen of many plants.

Some plants and specific plant parts present unusual problems with respect to obtaining high quality protein samples for analysis. Our broad experience with many different types of plants and familiarity with the biochemical and plant physiological literature allows VARI-IDENT to respond quickly to your specific concerns. Extraction procedures for problem plants and tissues, for example those with rapid and excessive discoloration, have been developed and are under constant improvement.

VARI-IDENT LABORATORIES is equipped with state of the art electrophoresis apparatus and a computer-based library of the literature describing extraction and electrophoresis of plant proteins and enzymes."



Dr Harry D Niemczyk, Professor of Turfgrass Entomology, Ohio Agricultural Research and Development Center, Wooster, Ohio 44691 will be working on a pest about which there is very little known.

The frit fly, Oscinella frit (L.), is a small black fly often present in large numbers on golf courses and seen by golfers when it lands on white clothing or golf balls. Recognized as a nuisance to golfers, the frit fly larvae can and do cause damage to turfgrass, especially greens, collars, and aprons. Adults lay eggs that hatch into small maggots which tunnel into grass stems to feed on growing tissues. Little is known about the insect; in fact, it has never been studied on turfgrasses in the U.S. Research is currently underway to study the biology, seasonal life history and distribution of this pest on golf course turf. The work is being conducted by Mike Tolley, Ohio State University PhD graduate student, under the guidance of Dr Niemczyk. The project is being supported, in part, by the Ohio Turfgrass Foundation.

P.O.BOX 108 Continued

FERTILIZER DEALER SURVEY

Dennis E Brown of the National Fertilizer Solutions Association, 8823 North Industrial Road, Peoria, Illinois 61615 reports that a survey of fertilizer industry representatives, primarily retailers, attending the July 25-27, 1984 mid-year Round-Up management conference of the National Fertilizer Solutions Association (NFSA) reveals current trends within the industry.

Agronomics Topics Probed

Survey respondents by an 80 % majority felt crop consultants help retain existing customers and gain new ones. An outside consultant was used by 22 % while 33 % have hired someone to specifically serve as an inhouse crop consultant for their dealership. Computers are found in 77 % of the retail outlets. The recent Spring season was above average for 60 % and average for 38 %. The coming Fall season is expected to be above average by 37 % and average by 56 %.

Results of the poll were as follows:

1. Please indicate your region of the country
   65 % midwest 3 % northwest 4 % east
   11 % southeast 11 % northeast 4 % west
   2 % southwest

2. Do you use an outside crop consultant ?
   22 % yes 78 % no

3. Do you intend to hire an outside crop consultant ? 6 % yes 94 % no

4. Have you hired someone to specifically serve as an inhouse crop consultant for your dealership ? 33 % yes 67 % no

5. Do you intend to hire an inhouse crop consultant for your dealership ? 16 % yes 84 % no

6. Do you expect to see more use of crop consultants by dealers ? 75 % yes 25 % no

7. Do you feel crop consultants help retain existing customers and gain new ones ?
   80 % yes 20 % no

8. Have you installed a computer in your dealership ? 77 % yes 23 % no

HOLY CROSS PRESIDENT HONORED

Reverend John E Brooks, S J, President of the College of the Holy Cross in Worcester, Massachusetts, will receive the Professional Grounds Management Society's coveted Gold Medal Award. This award is given for very outstanding horticultural achievement. To date, only eight awards have been given since the society's founding in 1911. Some of the other winners have been Norman Rotanzi of San Simeon, California in 1982, Mrs Lyndon B Johnson in 1968 and Frederic A Huette in 1966.

Father Brooks will receive his award at the Awards Banquet on the concluding night of the PGMS Annual Conference and Trade Show on October 10 at the Worcester-Marriott Hotel in Worcester, Massachusetts. A lifetime honorary membership goes with the gold medal award.

President Brooks, cited for demonstrating environmental awareness and active interest in the maintenance, improvement, and preservation of the College grounds that distinguishes outstanding grounds management, has been President of the College of the Holy Cross since 1970. His encouragement of a beautiful environment has been an inspiration to the college and to the surrounding community.

THREADING THE JOURNALS

(Published research results)

GROWTH RETARDANT EFFECTS ON THREE TURFGRASS SPECIES

N E Christians and J Nau

Journal of American Society for Horticultural Science Vol 109 Number 1 45-47

Growth regulating compounds designed to retard the growth of turfgrasses are still very much in the developmental stage. Many applications have been only marginally successful. Inhibition of seedhead emergence has been noted along with growth limitations where low maintenance turf is cultured. Less favorable results have been obtained where turf is grown under high maintenance conditions. Phytotoxicity, lack of uniformity in response among species and tendency for many retardants to inhibit root and rhizome development along with shoot growth are most often cited as limiting factors.

Since monostands of a single species are seldom found, while polystands of Kentucky bluegrasses, fine fescues, perennial ryegrasses and sometimes tall fescues are common, the importance of uniform response with different grasses becomes obvious. Baron Kentucky bluegrass, Kentucky 31 tall fescue and Reliant hard fescue were used as test plants in the evaluation of treatment effects of mefluidide, ethephon and BAS 10600W.

Results of the study indicate that polystands of Kentucky bluegrass and hard fescue could be expected to respond similarly to mefluidide, BAS 10600W and to the low rate of application of ethephon. Where tall fescue is used in the polystand, variations in response can be expected.

SALINITY AFFECTS GERMINATION AND GROWTH OF TALL FESCUE CULTIVARS

G L Horst and N B Beadle

Journal of American Society for Horticultural Science Vol 109 Number 3 419-422

A laboratory study was made to evaluate total germination, rate of germination, seedling weight and leaf blade length of turf type tall fescue cultivars as influenced by increasing salt levels. This information will contribute toward improving methods of selection and breeding for salt tolerance of turfgrasses for areas having declining water quality and saline soils. The hydroponic growth medium containing 15,000 ppm salt was found suitable for the identification of cultivars with potential salt tolerance and commercial value under saline growing conditions. Cultivars which had less than a fifty percent growth reduction compared with the control were considered salt-tolerant. Broad-sense heritability estimates indicated that germination percentage, blade length, seedling dry and fresh weights and germination rate (in that order) are viable selection criteria for salt-tolerance screening. The cross-pollination characteristic of the species should enhance improvement through recurrent selection.

Falcon and Houndog produced numbers of seedlings greater than the mean for all sixteen cultivars with increasing salt concentration. Clemfine and Houndog had germination rates higher than the mean for all sixteen cultivars with increasing salt concentration. Houndog had larger fresh and dry weights and longer leaf blades than the mean for all sixteen cultivars with increasing salt concentration. Clemfine and Falcon had larger dry weights and longer leaf blades than the mean for all sixteen cultivars at the lower rates of salt concentration.

GOOSEGRASS CONTROL IN TURF IN THE TRANSITION ZONE

P H Dernoeden, T L Watschke and J K Mathias

Weed Science Vol 32 Number 1 4-7

Goosegrass is known to be one of the most difficult weeds to control in turf. Repeat applications of organic arsenicals applied post-emergence are usually effective, but result in unacceptable levels of turf injury. Conditions for goosegrass are especially favorable in the transition zone between cool and warm regions of the country where turfgrasses are weakened because of environmental stress.

Goosegrass seed usually starts to germinate in late May or early June and continues to sprout throughout the summer. Thus, the use of preemergence herbicides requires repeat applications. Studies in Maryland were conducted with Oxadiazon, Benefin, Bensulide and DCPA applied at recommended rates. Single and sequential applications of Bensulide and DCPA did not effectively control goosegrass in any of the three test years. Benefin usually required sequential dosages to obtain good (90%) to excellent (95%) goosegrass control. Nearly all rates of Oxadiazon used provided good to excellent weed control.

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The Better Lawn and Turf Institute is incorporated as a nonprofit business league formed exclusively for educational and research purposes concerned with agronomic, horticultural and landscape concepts.

Lawn Institute Harvests is dedicated to improved communications among turfgrass seed and allied turf industries and other firms, businesses, organizations and individuals with lawngrass research and educational interests and concerns.

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