"Green is Beautiful"

Ontario Golf Superintendents Association

54 HERNSHAW CRESCENT – ETOBICOKE, ONTARIO M9C 3M4 – TELEPHONE 622-9929

Next Meeting . . .

Galt Field Day

HOST: PAUL SCENNA

7:30 – 8:15 A.M. – COFFEE & DONUTS

8:30 A.M. – SHOT GUN

1:00 – 1:45 P.M. – LUNCH

2:00 – 4:30 P.M. – TURF PLOTS

6:30 P.M. – DINNER

JACKET & TIE COMPULSORY

COST FOR DAY – $25.00 PER PERSON

DEADLINE DATE – MAY 25, 1981

BOARD OF DIRECTORS - 1981

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MEETINGS - 1981

Date		
Thurs., June 11	Galt Field Day	Galt Country Club
Fri., July 17	President, Greenschairman, Supt. Day	Scarborough Golf Club
Fri., August 7	O.T.R.F. Invitational	National Golf Club
Mon., August 24	Pro-Superintendent	Castlemore Golf Club
Mon., September 28	McClumpha	Chinguacousy Golf Club
December	Annual Meeting	
January	January '82 Symposium	University of Guelph

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MICHIGAN AND BORDER CITIES ASSOC. MEETING AT ESSEX GOLF CLUB

The weather started out wet and then cleared long enough to give most people a chance to finish 18 holes. For those who didn't get wet on the golf course, the complimentary beer at the Club House quenched their thirst.

Before going any further, Bill Fach must be congratulated on the excellent playing conditions he provided for us at Essex.

The turnout was good with 80 for golf and 120 for dinner. The wet weather and free beer, had no effect on Graham Shouldice, as he proceeded to ace the seventh hole with a fine stroke. Congratualtions Graham.

Low score of the day - 72, was shot by Mr. Priscorn from Michigan. Hugh Kirkpatrick shot the finest round from Ontario, with a 74.

Michigan won the Team Trophy with a total of 298, made up of:

Mr. Priscorn	72
Mr. Myers	73
Mr. Delcamp	76
Mr. Mitchellson	77

Ontario Team score was 313, made up of:

Hugh Kirkpatrick	74
Graham Shouldice	76
Rick Cylka	81
Bill Fach	82

After an excellent dinner, the Guest Speaker, Dr. Paul Rieke, up-dated us on the new 10-acre turf field lab at Michigan State University. His main topic was, The Use of Wetting Agents on Localized Dry Spots. Some points made by Dr. Rieke were:

- if you have a localized dry spot problem, start applying wetting agent in the Spring.
- do not apply wetting agents during periods of stress.
- Phytotoxicity was always more severe where high nitrogen levels were used.
- best results were obtained, when the turf was watered prior to, and, after applications of wetting agent.
- Hydro-wet and Aqua-grow gave the best long term results with Hydro-wet being the best.

Thanks again to Bill Fach and the Staff at Essex and the Michigan Border Cities Assoc. for a fine day.

O.G.S.A. AND W.O.G.A. MEETING

Sixty-three golfers toured the St. Catherines Golf and Country Club on a fine, bright sunny day. Hugh Kirkpatrick was the Low Gross winner with a 77 and Bill Glashan picked up Low Net with a score of 71. A meeting followed golf with a long discussion on sand top dressing. Norm McCollum filled us in on research work that had been done at the Turf Plots on sand top dressing. A fine steak barbeque followed the meeting. Special thanks to Lorraine and John Piccolo, Bill Glashan, Steve Miller, Bob Kennedy and Barry Britton for organizing the day.

GOLF SCORES

Gross –

1	Hugh Kirkpatrick	77
2	Joe Kenney	80
3	Kimmo Salonen	80
4	Bob Demude	81
5	Mark McDonald	83
6	Bob Kennedy	84
7	Bob Brewster	85
8	Whitey Jones	85

Net –

1	Bill Glashan	71
2	Ted Hartwell	72
3	Don Norris	72
4	Keith Nesbit	72
5	Walt Winjack	73
6	Steve Miller	73
7	Bob Cherry	73
8	Doug Colley	73

EDITOR'S COMMENTS

Most courses in Ontario got off to an early start this Spring. Golf Courses in the Toronto area came through the winter with very little winterkill. I hope that you will be able to attend the Turf Plots at the Galt Meeting as there are a lot of new research activities underway. The President, Greenschairman, Superintendent Day invtations will be in the mail soon. Get your entry in A.S.A.P. if you expect to get into this event. Anyone that has any material for the Newsletter please forward it to the O.G.S.A. Office.

NOTE: The Pro-Superintendent Tournament will be held at Castlemore Golf Club on Monday, August 24, 1981.

Support

Your

O.G.S.A.

"ATTEND A MEETING"

AIR MOVEMENT AND SYRINGING

Effects on the Microenvironment Bentgrass Turf

By D. Thomas Duff and James B. Beard

Syringing is a management practice that can be utilized on bentgrass putting greens to mitigate temperature extremes of the microclimate during high temperature stress periods. A light application of water is applied to cool the leaf surface through evaporative processes and to raise the relative humidity adjacent to the turfgrass plant to alleviate leaf moisture stress that may develop.

A grouping of trees and shrubs is often utilized (a) to separate a putting green from a nearby tee or other playing area, (b) to serve as a backdrop behind a green, and (c) simply for beautification. The proper placing and arrangement of these ornamental screens is particularly important because they may drastically restrict air movement over the turf. In humid regions, difficulties in maintaining bentgrass turf usually result due to air stratification and accentuated temperature extremes at the surface of the turf. The high temperatures and extended dew periods existing on such areas result in a weakened turf and a greater incidence of disease.

Experimental Procedures

In the summer of 1964 experiments were designed and carried out at Michigan State University to study (1) the effects of air movement over turf and (2) the magnitude of cooling which can be attributed to syringing. Turf areas 6′ x 3′ were isolated using frames partially covered with six mil, clear polyethylene plastic. In one treatment, the sides and both ends of the frames were covered so that minimal air movement was permitted. In the second treatment, only the sides of the frame were covered. The ends were left open and a six-inch electric fan was placed at one end. Anemometer readings indicated that the fan provided a constant air movement of 4 MPH over the turf. Conversely, the area which was completely enclosed had no measurable air movement, as indicated by the anemometer. The tops of both enclosures remained open to provide for exchange of energy, water vapor, and gases with the surrounding atmosphere.

The frames were put into place and taken up daily so the areas could be mowed and maintained in accordance with standard putting green practices. The frames were positioned and environmental readings taken only when the solar angle was great enough so that the sunlight was directed on the area under study and not through the plastic. Temperatures were measured in the turf mat and at the two-inch soil depth. For comparison, the shaded air temperature immediately above the turf was measured outside but adjacent to the treatment area.

The turf utilized in this study was composed of Toronto creeping bentgrass cut daily at ¼ inch. The soil was a loamy sand with adequate phosphorus and potassium levels. The area received 7 pounds of nitrogen per 1,000 square feet per year and was irrigated deeply and at a frequency which prevented visible wilting.

Air Movement Effect: The influence of air movement on the temperature of the turfgrass mat in relation to the ambient air temperature is shown in Figure 1. When air movement was restricted, the mat temperature became greater than the air temperature two hours after the frames were placed on the treatment site and remained higher for the duration of the treatment period. When air at a 4 MPH velocity was passed across the turf, the mat temperature never reached the temperature of the adjacent air. At 2 PM temperature of the turfgrass mat was decreased 13°F when subjected to a wind

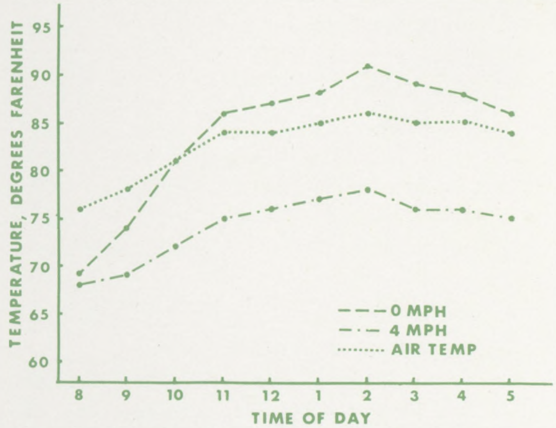

Figure 1. Influence of air movement on the turfgrass mat temperature in relation to ambient air temperature.

movement of 4 MPH. Prior to each observational period, the turfgrass mat temperature was lower than air temperatures immediately above the turf.

The temperature levels at the two-inch soil depth under the two air treatment regimes are shown in Figure 2. Under putting green conditions, a majority of the bentgrass roots are found in this soil zone during the midsummer high temperature periods. At 2 PM, the soil root zone temperature under the 4 MPH wind velocity was 10° cooler than the 0 MPH air movement regime and remained at this level for the rest of the observation period.

Syringing Effect: The effects of syringing on the turfgrass mat temperature are shown in Figure 3. Temperatures followed the same pattern during the early portion of the day as reported in the previous studies. When a light syringing

Air Movement and Syringing

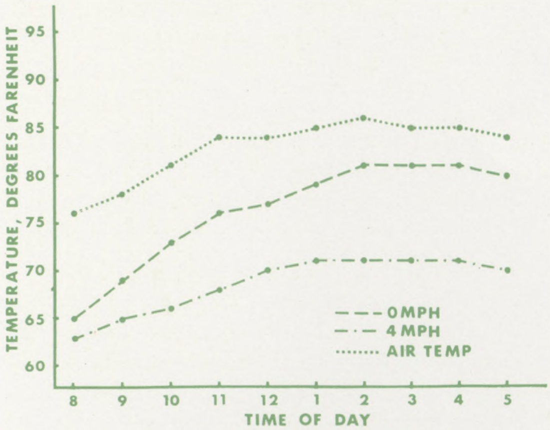

Figure 2. Influence of air movement on the two-inch soil temperature in relation to the ambient air temperature.

was applied to the turf at 12 noon, the turfgrass mat temperature was again lowered slightly under both air treatments. Under restricted air movement, syringing decreased the mat temperature to the level of the air temperature, but within one hour, the turfgrass mat temperature was greater than the air temperature. When air of a 4 MPH velocity was moved across the turf, the mat temperature never reached the level of the air temperature. Within ½ hour after the 2 PM peak the mat temperature began to decrease in both cases and continued to do so for the remainder of the day.

The temperature response to syringing at the two-inch soil depth is shown in Figure 4. The temperature decrease caused by syringing was quite small and temperatures started to increase soon after water was applied.

Discussion

In these studies, temperatures in the mat and at the two-inch soil depth were influenced more by air movement than by syringing. These results demonstrate the importance of good air circulation in maintaining a favorable microenvironment for growth of turfgrasses. When air circulation is restricted by screens formed by plant growth or by physical features of the landscape, the problems of retaining quality turfgrasses are increased. The high soil temperatures resulting from lack of air movement results in increased loss of the bentgrass root system and subsequent reduced vigor of the turf which, in turn, is more susceptible to such adversities as disease or moisture stress.

The magnitude of cooling by syringing was small, yet even this small degree of cooling could

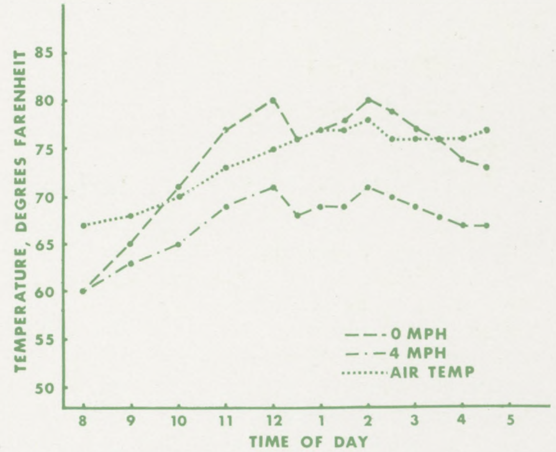

Figure 3. Influence of syringing at 12 noon on the mat temperature at two air movements in relation to the ambient air temperature.

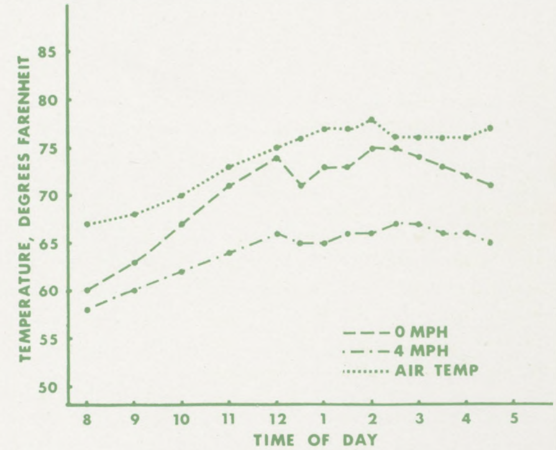

Figure 4. Influence of syringing at 12 noon on the two-inch soil temperature at two air movements in relation to the ambient air temperature.

be of vital significance since it does modify the normal diurnal cycle of turfgrass temperatures. The net result was a significant dampening in the maximum turfgrass temperature which might have occurred had syringing not been practiced. At critical soil temperatures of 75°F and above, the moderation of temperature maximums can be quite important in maintaining a healthy, vigorous turf.

Syringing supplies a small amount of readily available water which serves to prevent wilting of the turf. This light application of water tends to raise the relative humidity immediately adjacent to the leaf and, thereby, reduce the transpiration rate. It should be pointed out that indiscriminate watering, particularly if applied in excessive amounts, can lead to soil compaction, oxygen deficiencies and poor rooting. Syringing should only be practiced under stress conditions and should be utilized judiciously.

Dr. D. Thomas Duff is Assistant Professor, Department of Agronomy, University of Rhode Island (formerly Graduate Teaching Assistant at Michigan State University). Dr. James Beard is Associate Professor, Department of Crop Science, Michigan State University.

This work partially supported by a grant from the Michigan Turfgrass Foundation.

From: The Golf Superintendent - March 1968

OVERSEEDING GOLF COURSE FAIRWAYS

J.L. Eggens, Associate Professor,
University of Guelph.

At the present time overseeding golf course fairways is not usually successful because:

1. annual bluegrass re-invades the overseeded areas and crowds out the overseeded grasses through superior plant competition,
2. there are no post-emergent herbicides which will selectively remove annual bluegrass from creeping bentgrass swards without unacceptable injury to the creeping bentgrass and newly overseeded grasses and
3. pre-emergent herbicides may not be safely used for 8-10 weeks after overseeding, long after annual bluegrass has successfully reinvaded the overseeded area.

The mechanical overseeding operation (including seed germination and seedling development) is usually very successful (Eggens 1979). Research by Dr. C.M. Switzer, University of Guelph, has shown that competition from existing annual bluegrass plants can be eliminated by treating the fairways with the non-selective herbicide such as Glyphosate. Glyphosate is usually applied at 1.5 to 2 lb. (active ingredient) in 20 to 30 gallons of water per acre (after omitting at least one mowing) four to seven days prior to the overseeding operation. Do not use gramoxone where thatch is heavy because of the tendency of gramoxone to remain in the thatch layer and kill the overseeded seedlings as they push through the thatch layer. The Glyphosate-treated turf dies over a 10-14 day period and will provide a reasonably good playing surface for golf for three to five weeks or longer. As Glyphosate does not kill the annual bluegrass seed in the fairways, it subsequently germinates to reinfest the fairway.

Pre-emergent herbicides have provided some control of annual bluegrass in established turf. However, Turgeon (1974) has shown that pre-emergent herbicides are somewhat ineffective in reducing the amount of annual bluegrass in the turf where conditions are favourable to its growth and development. Post-emergent herbicides such as Po-san (Goss and Zook 1971) and Endothal (Turgeon et al 1972) have reduced annual bluegrass content of golf course fairways but the limits on season of application, the susceptibility of perennial turfgrasses to injury and the unacceptable discoloration of the turf sward has limited their use. Ingratta et al (1978) found that annual bluegrass can be selectively removed from Kentucky bluegrass turf with a granualr formulation of linuron at 6.7 kg/ha when applied postemergence. They found however that because of phytotoxic residues in the soil, overseeding could not take place for three months after linuron treatment.

Golf course fairways are usually overseeded with creeping bentgrass because of its desirable characteristics as a fairway grass. However, no specific studies on the competitive ability of the available creeping bentgrass cultivars has been carried out. Generally Seaside is used because of low seed cost. However, because of the superior vigor and aggressiveness of the newer cultivars against annual bluegrass, a blend of the recently developed cultivars should be used or included in a blend with Seaside. Kentucky bluegrass cultivars may be used successfully on golf course fairways where the mowing height is 3 cm or above and the growing conditions too hot and dry for creeping bentgrass culture. Table 1 shows that some Kentucky bluegrass cultivars compete more successfully against annual bluegrass than others with A-34 (Bensun) Sydsport and Touchdown the most successful competitors at the 2 cm (¾ inch) mowing height of the Kentucky bluegrass cultivars evaluated. Perennial ryegrass is often used as temporary or emergency cover and again considerable differences exist in the competitive ability of the cultivars as shown in Table 2. Under uniform annual bluegrass competition Omega has a higher dry top weight (ie competed better with annual bluegrass) than Derby, Manhattan and Yorktown at both the 2 and 4 cm (¾ and ½ inch) mowing height. Sabre rough bluegrass is a strong competitor against annual bluegrass and may find use on regularly irrigated moist fairways mowed at 2 cm.

Overseeding success and the reduction of annual bluegrass in golf course fairways may be improved by the following:

1. overseed during the period mid-June to early-July rather than during August to allow herbicide treatment of the overseeded area during September.
2. if overseeding takes place into turf which has not been killed out with Glyphosate, reduce the mowing height to 1-2 cm to reduce shading of the seedlings from the competing mature grasses.
3. Tupersan may be used at overseeding time to reduce annual bluegrass seed germination.
4. use urea as the nitrogen carrier and avoid excessive amounts of available nitrogen. For creeping bentgrass fairways, reduce the amount of nitrogen supplied late August, September and October and supply nitrogen as a dormant application early to mid-November.
5. reduce phosphorus to limit annual bluegrass seed production and seedling establishment. Control potassium applications to that required by the turf for good growth. While the role of potassium in annual bluegrass dominance is not well understood, Waddington et al (1978) found that the highest potassium treatments used in their study markedly increased the annual bluegrass content of the Penncross creeping bentgrass turf when compared to the lower potassium treatments.
6. carefully control irrigation to reduce moisture available for annual bluegrass germination. When grown under a hardened condition, creeping bentgrass is very drought tolerant.
7. overseed the fairway in three directions, longways, crossways and diagonally. Do not use excessively high

OVERSEEDING GOLF COURSE FAIRWAYS (cont'd)

seeding rates. Adequate overseeding rates for the Roger's slit or disc overseeder are 20-25 lb. per acre for Kentucky bluegrass and 8-12 lb. per acre for creeping bentgrass when overseeded in three directions.

Table 1. Dry shoot weight and tiller number of nine Kentucky bluegrass cultivars and annual bluegrass when grown in uniform annual bluegrass competition for 160 days.

Species and	Shoot number		Shoot dry weight (mg)	
	2 cm†	4 cm	2 cm	4 cm
Kentucky bluegrass				
Adelphi	6	4	80	50
A-34	32	16	150	200
Baron	10	14	90	180
Bonnieblue	10	9	70	120
Glade	11	15	80	200
Nugget	14	11	60	90
Sydsport	20	17	160	220
Touchdown	20	23	140	220
Victa	10	9	60	120
Annual Bluegrass	36	57	260	630

†Daily mowing height of 2 cm (¾ inch) and 4 cm (1½ inch).

Table 2. Dry top weight of four perennial ryegrass cultivars and annual bluegrass, grown in uniform annual bluegrass competition for 210 days in the greenhouse.

Species and cultivar	Mowing height 2 cm	4 cm
Perennial ryegrass	120	270
Derby	120	270
Manhattan	60	300
Omega	150	360
Yorktown	60	230
Annual bluegrass	120	250

Eggens, J.L. 1979. The response of some Kentucky bluegrass cultivars to competitive stress against annual bluegrass. Can. J. Plant Sci. 59:1123-1128.

Goss, R.L. and F. Zook. 1971. New approach for Poa annual control. Golf Superintendent: 46-48.

Ingratta, R.G., G.R. Stephenson and C.M. Switzer. 1978. Selective control of annual bluegrass in Kentucky bluegrass turf with linuron. Can. J. Plant Sci. 59:469-473.

Switzer, C.M. 1977. Turf Renovation. Ontario Golf Superintendents Association Field Day, Cambridge Research Station, Cambridge, Ontario.

Turgeon, A.J. 1974. Annual bluegrass control with herbicides in cool-season turfgrass. Proc. 2nd. International Turfgrass Research Conference: 382-389.

Waddington, D.V., T.R. Turner, J.M. Duich and E.L. Moberg. 1978. Effect of fertilization on Penncross creeping bentgrass. Agron. J. 70:713-718.

U.S.G.A Special Report: "COPING WITH THE WATER SHORTAGE"

Each year it seems that some region of the country is faced with a shortage of water. If the problem becomes critical enough and water-use restrictions are imposed, one of the first affected is golf course irrigation. Although the golf industry generates millions of dollars in goods and services and employs thousands of people, golf course irrigation is considered a recreational use of water in most states and therefore has a low priority during a water shortage. The limits placed on course irrigation in any particular area may vary from voluntary conservation to mandatory restrictions to a complete ban on all water uses. In each instance, short-term and long-term management programs must be thoughtfully designed in order to ensure the best possible survival of existing turf areas.

Here are some thoughts on how to make best use of existing water resources and how to condition turfgrasses for drought conditions.

The Irrigation System

A well-designed, correctly-installed and properly-utilized automatic irrigation system provides the best means of conserving water. Water savings of 40 to 75 per cent have been documented on golf courses which converted from a manual to an automatic system. However, regardless of the type of irrigation system available, it should be operating at peak efficiency. Steps should be taken to increase its efficiency if the situation permits.

- Repair all leaks.
- Check nozzle size as it relates to available pressure and resulting coverage.
- Check for nozzle wear.
- Where necessary, relocate heads to improve water distribution.
- Use half-circle sprinklers where applicable.
- Check pump performance and other pumphouse systems.

Irrigation Practices

Proper use of the irrigation system is one of the most important factors in conserving water. Preparing turf for hot summer weather requires that little, if any, irrigation water be applied during the spring. Encourage the turf to establish a deep, fibrous root system in the spring by allowing the soil to become dry between rains and/or irrigation sessions.

- Before irrigating, use a soil probe to determine existing soil moisture and rooting depth.
- Apply water as uniformly as possible, depending on soil conditions and plant needs.
- Apply water only as fast as the soil can accept it. To avoid puddling and runoff, use short, repeat cycles or else cultivate the soil (core, slice, spike) to improve water infiltration.
- Irrigate when there is little wind and when the temperature is relatively low, usually at night.
- Hand-water critical areas if it can prevent overwatering adjacent areas.
- Constantly monitor the system to ensure that all heads are operating as they should be.

Cultural Programs

- Aerification — aerate (core) turf areas during the spring in order to relieve soil compaction, promote root growth and improve water infiltration (note: concerns about *Poa annua* encroachment after spring aerification are of secondary importance when drought stress may place the survival of the turf in jeopardy).
- Cultivation — spike and/or slice turf areas when weather permits throughout the season so that good water infiltration is maintained.
- Wetting agents — a wetting agent should be used during the spring, and at lighter rates during the summer, to promote good water infiltration through thatch and soil, to improve soil water retention and to prevent dew formation. It is normally used on greens and collars, but can be beneficial to most turf areas.
- Fertilization — use relatively low rates of nitrogen fertilizer. A lush, fast-growing turf uses more water and is more susceptible to injury from other stresses. Coordinate applications with predicted rains or apply during light rains.
- Diseases and Insects — avoid turf damage from diseases and insects by utilizing a proper pest-control program.
- Weeds — apply herbicides in the spring for weed control only if large numbers of weeds are present (broadleaf) or can be anticipated (crabgrass). If spraying must be done, spot-treat the worst areas rather than making a blanket application.
- Cutting height — if possible, raise the cutting height and reduce mowing frequency on tees, fairways and roughs. It is unlikely that much benefit will be derived from raising the height on greens already cut at 3/16" - 1/4".
- Thatch control — if excessive thatch is a problem, then thatch control measures (aeration, spiking, slicing, verticutting) and wetting agents should be utilized on a regular basis.
- Overseeding — on turf areas composed primarily of *Poa annua*, plans should include overseeding during late summer or early fall with a more drought-tolerant grass species. Turf areas which cannot be irrigated during the summer will likely require renovation during the fall.

— James T. Snow, Senior Agronomist,
Northeastern Region