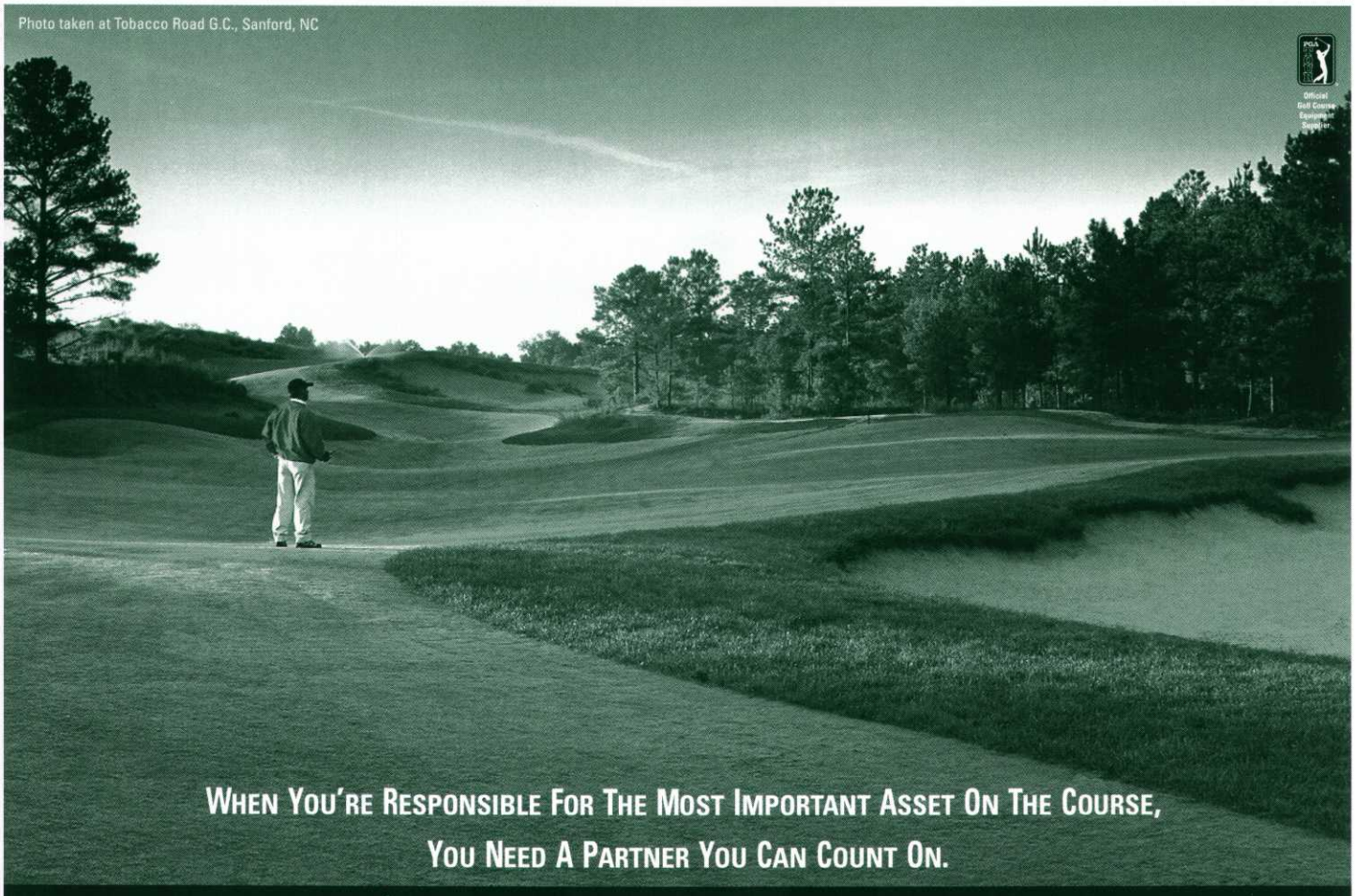

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HOLE NOTES

Official Publication
of the MGCSA

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From Your President's Desk

It's Been A Spring Of Two Seasons

Rick Fredericksen, CGCS
MGCSA President

This has been the spring of two seasons for many of us. The beginning of April started off very dry and many of us with older irrigation systems worked to get them functional. The record deep frosts played havoc on galvanized "swing" joints as many of the sprinklers were lifted off their threads. The end of April and the front half of May have been all rain near the Twin Cities. Cutting grass is now the order of the day.

Spring began early and the hours our staff have spent on the golf course adds up as the season goes along. The days run together and many of us lose track of time and forget the things that are the most important to us - our family and friends. A few years ago when Jim Nicol was president of our association, he noted in his column how important it was to take some time off in the summer and get away from work. This would also apply to your staff. It is important that we remember not only ourselves during the busy golf season but our staffs also.

* * * *

The previous two issues of the *Hole Notes* printed in color have been well received. The color adds a new dimension to our magazine and the Affiliates that have begun advertising in color love it. Executive Director Scott Turtinen located a printer in St. Cloud with the capability to economically print *Hole Notes* in color . All copy is transmitted electronically to the printing company and proofing is viewed over a special website which saves time in the process of producing the publication.

While we are on the subject of *Hole Notes*, I would also like to commend our editor, Jack MacKenzie on April and May's magazine. With emphasis placed on articles that are directly relevant to our current management practices, the disease issue followed by the irrigation/drainage issue was both educational and timely. Jack has informed us there will be further issues dedicated to tree care, University of Minnesota Field Days and greens covers.

* * * *

I would recommend to all members to reassess your water cooler refilling procedures. After an incident in Arizona, this has become a concern in Minnesota. Paul Eckholm, our legislative chairman, is following this matter closely. He does remind us though that the Department of Health can establish its own rules, to a certain extent like the State Board of Electricity.

--Rick Fredericksen, CGCS
MGCSA President

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Inside This Issue of Hole Notes

ADVERTISERS

Alternative Turfgrass Trials 2002-2006

By Mary H. Meyer
University of Minnesota

In the fall of 2002, a second alternative turfgrass trial was planted at three locations: the Minnesota Landscape Arboretum, Chanhassen, MN; Lake Harriet Rose Garden, Minneapolis; and the Turfgrass Outreach and Research Center, St. Paul. The objective of the trial is to evaluate plant materials under reduced inputs and compare them to traditional turfgrasses. The project is planned for data collection over three years: 2003-2005, with final results published in 2006. Cooperators include the University of Minnesota Department of Horticultural Science, College of Agricultural, Food, and Environmental Science, Minnesota Landscape Arboretum, and the City of Minneapolis Park and Recreation Board.

Methods and Materials: Materials were planted in late August and early September in 10' x 10' plots with three replications at each of the three locations.

2. Fertilization in early September and early October, 27-6-20, 50% slow release nitrogen
3. No additional fertilizer after initial soil preparation.

Herbicide, Fungicide and Insecticide application
No pesticides will be applied.

Irrigation: If necessary, irrigation will be supplied for 2 weeks after seeding, then no supplemental irrigation is planned.

Plot Design: Each of the materials will be planted in 3, 10' x 10' plots at each location. Plots will be randomized within three blocks of the 12 materials. 36 plots in total at each location, except in Minneapolis where eight materials or 24 plots will be studied.

Evaluation: Materials will be evaluated twice monthly during the growing season for color, cover and overall quality. Color and cover will be evaluated on a scale of 1-5, 5 being the best color or most cover. Overall quality will be rated on a 1-3 scale with 3 being the most desirable. Several evaluators will contribute evaluations including general public and Master Gardeners.

Material	Supplier	Seeding/Planting Rate	Comments
1. Barkoel	Barenburg	2 lb/1,000 sq ft	*Koeleria cristata*
2. Barleria	Barenburg	2 lb/1,000 sq ft	*Koeleria cristata*
3. Barcampsia	Barenburg	2 lb/1,000 sq ft	*Deschampsia caespitosa*
4. Turtleturf	Agrono-Tech	4 lb/1,000 sq ft	*Koeleria cristata*
5. No Mow	Prairie Nursery	5 lb/1,000 sq ft	fine fescue blend
6. Dryland	Nichols Nursery	2 lb/1,000 sq ft	KB, PR, CRF
Ecology Lawn Mix			
7. Sunny Mix	Twin City Seed	4.5 lb/1,000 sq ft	CKB, CRF, PR
8. Clover & Fescue	Twin City Seed	6 oz & 5 lb/1,000 sq ft	white clover and CRF
9. Juncus tenuis	Ernst Seeds	1 oz/ 1,000 sq ft	native path rush
10. Carex flacca	Morris ROC collection	12" spacing	vigorous rhizomes
11.Carex pensylvanica	Arboretum collected	12" spacing	native sedge
12. Viola labridorica	Stepables	12"spacing	hardy, native violet

Juncus, Viola, and Carex will not be planted at the Minneapolis location since they will be mowed at a minimum maintenance level.

Mowing: Plots will be maintained at three mowing heights: 2", 4" and minimum maintenance or two mowings: mid June and mid October. Minneapolis plots will be maintained at one constant height of 2-3".

Fertilization: Soil tests indicated adequate P and K, therefore 1 lb nitrogen per 1,000 sq ft was incorporated just prior to planting. Three fertility treatments will be maintained:

1. Fertilization in early September, 27-6-20 50% slow release nitrogen, rate of 1 lb/1,000 sq ft

Sponsors: Barenburg, USA, Albany OR; Agrono-Tec Seed Co, Wildomar, CA; Prairie Nursery, Westfield WI; Twin City Seed, Edina, MN; Nichols Nursery, Albany OR; Ernst Conservation Seed, Meadville, PA; Stepables, Inc, Salem, Oregon.

(Editor's Note: Mary H. Meyer is an Associate Professor in the Department of Horticultural Science at the University of Minnesota.)

TURFGRASS MANAGEMENT 101

By David Hackleman
Herman-Norcross Community School

Herman-Norcross Community School is located in West Central Minnesota and is a small rural school. It has a varied agricultural based economy with a population of 450. The community school houses K-12 and approximately 160 students attend the school. Over the past two years, a new course has been offered to broaden the interests and career opportunities for these students.

In September 2001, a Turfgrass Management class was offered with nine students participating the first semester. Since then, twenty students have taken the course. The objectives are to 1) teach young adults about the turfgrass industry, 2) to form a working relationship between the school, colleges, and turfgrass businesses, 3) To provide students with enough knowledge and training to seek entry-level jobs, 4) To promote the turf and lawn care industry, and 5) To encourage and assist students interested in pursing this career.

Within the class, topics include: career exploration, turfgrass growth and development, turfgrass management and operations, turfgrass pests and control, turfgrass equipment and maintenance, and human resources.

Along with a lecture style format, students have numerous laboratory experiences. With almost every topic, there is a lab assignment to enhance understanding and knowledge of classroom materials. Students do seed identification, germinate and grow various turfgrass species in 4" pots, graph their growth, record when they mow and fertilize the pots, and monitor on a daily basis recording data 2-3 times/week. The students have also set up five 20' x 20' plots outside the school facing south. The plots have been established to do fertility studies, study the effects of mowing heights and growth, and to do soil samples, which are done in the fall. Results are then compared with past samples to see how fertilizer has changed the soil pH, and how macro and micronutrient levels in the soil have changed. Depending on class size, a group of 2-3 students will have a plot to care for in the fall and spring of the year. One plot has been determined as a control with no treatments done other than mowing at 2". As a final project in this class, each student is asked to design and draw to scale a turf facility. It could be a golf course, football, baseball, or soccer field, park, tennis court, or perhaps a large commercial property. They must also draw an irrigation system to scale. Afterwards, they must write a management plan including:

+ An introduction
+ Size and scope of project
+ Soil type, soil pH, and any amendments if needed to change the pH
+ Turfgrass species used and why
+ Mowing schedule
+ Fertilizer types, how often it is applied, how much nitrogen added per application
+ Irrigation schedule, head spacing, number of zones, and how much water is applied per watering
+ Equipment needed to maintain their project
+ Personnel needed
+ Salaries for employees
+ Total budget for their project

The University of Minnesota at Crookston was contacted in September 2002 about the possibility of articulating this course with their 4-year degree program. After all the paperwork and committee meetings were completed, they approved college credits for the students enrolled in this new and exciting high school class.

As a class project, we took one of the designs and built it to scale. The project called Whispering Pines Golf Course was chosen. It is a nine hole golf course, par 36, playing to 3400 yards with each hole having three tee boxes. It also includes undulating fairways and greens, a few sand traps, a lake for irrigation, a clubhouse, and putting green.

We used a 4' x 8' x fi" sheet of plywood, put a 2" border all the way around, lined it with plastic and filled it with a soil mix. Then we laid out the course to scale (1" = 40'). The greens are sand based and the fairways, tees and rough areas are a mix of potting soil, peat, and sand. After the course was laid out, we seeded the green with Pencross Creeping Bentgrass, and the fairways, tees, and rough were seeded with a blend of Kentucky Bluegrass and Perennial Ryegrass. Once seeded, the soil surface was kept moist and after 4 days seedling germination and growth was noticed. After 10 days, a very visible stand of grass was noticed throughout the site. After 21 days, most areas were covered with a good stand of grass. On day 30, the first mowing took place. We mowed the greens at fi", and the other areas at fl" using scissors. On day 35, we applied a liquid fertilizer to all areas and the course was fertilized every two weeks afterwards. Mowing heights were gradually lowered to 1/8" on greens and fairways and tees at 1". Rough areas were mowed at 2". The course is still alive and well and we plan to do another project next fall when school starts.

In November 2002, a grant was written and submitted for $2,058.00, and in January 2003, the grant was awarded to the Herman–Norcross School. With this money, we bought textbooks, lab manuals, a soil testing kit, an aerator, a fertilizer spreader, soil probes, magnifying lenses, and a soil thermometer. We plan to utilize this equipment on the turfgrass plots to further our experiments. We plan to overseed the plots this spring with a blend of KBG and Perennial Ryegrass.

Area golf course superintendents have graciously allowed the students to come and visit. They give us tours of the course, shop, and explain their management strategies for maintaining their course. The students ask numerous questions and leave having a better understanding of how a golf course is managed and the amount of work required each day to prepare the course for the best possible playing conditions.

This class has been fun to teach and rewarding to see the kids take such an active role in learning about this exciting career in Turfgrass Management.

Nitrate Leaching During Establishment Of a USGA Bentgrass Putting Green

By Brian Horgan, Martin Burger, and Rodney Ventura
University of Minnesota

Introduction

The fate of fertilizers and pesticides applied to highly managed turfgrass is of concern. Nitrate (NO3) can be a public health concern if leached into ground water. It is important to understand if fertilizers applied to turf are leaching below the rootzone and into ground water supplies because of the public heath concerns related to NO3 in groundwater. Currently, the Environmental Protection Agency has set a limit of 10 parts per million of NO3 in ground water supplies.

Much effort has been spent over the last 15 years and data suggests that turfgrass is an excellent system to impede downward movement NO3. This is important considering the rates of fertilizers applied to turf range from approximately 43 to 258 lbs N per acre. Although the higher rates tend to be applied to putting greens grown on sandy soils, after establishment, the thatch layer provides a buffer to limit downward N movement. Therefore, even on putting surfaces grown on sandy soils with high water percolation rates, NO3 leaching has been shown to be minimal.

On newly established putting surfaces grown on sandy soils, thatch or organic matter is not present in quantities necessary to create the buffer as previously mentioned. At the same time, soluble fertilizers are applied frequently to compensate for the lack of deep roots to mine the soil for nutrients. In addition, water it applied multiple times during a day for growth and development of the seedling grasses. This scenario may present an opportunity for NO3 to leach.

The objective of this research project is to determine the potential for soluble fertilizers to leach through the profile of a USGA specification green with two different irrigation watering regimes during establishment of L-93 bentgrass seed.

Materials and Methods

Plots will be established on a USGA specification (88% sand:12% organic matter) putting green and seeded with L-93 bentgrass. Prior to establishment, two tension-based lysimeters were installed in each of six 10 by 10 ft plots. Irrigation will be supplied to each individual plot and separated with physical barriers that are inserted 12 inches into the profile.

Two irrigation treatments will be replicated three times; replace 80% of the calculated ET every two days minus rainfall inputs and irrigate daily with 20 minutes of water regardless of rainfall inputs. Fertilizers will be applied uniformly across all plots and will mimic typical grow-in recommendations made to golf course superintendents in Minnesota. Pesticides will be applied as need and plots will be mowed daily during the growing season at 0.188 inches with clippings removed.

Plots will be evaluated for turfgrass quality rated on a scale of 1-10 with 7 being minimal acceptance and percent ground cover during the grow-in. In addition, leachate-samples will be collected and analyzed for NO3, NO2, NH4 and total P using standard analytical procedures in the laboratory. Total volume of water that moves through the rootzone will also be determined using the lysimeters.

Results and Discussion

This experiment will commence in June, 2003 and will conclude in January, 2005.

(Editor's Note: Brian Horgan is an Assistant Professor in the Department of Horticultural Sciences at the University of Minnesota and Martin Burger and Rodney Ventura are USDA/ARS Soil Scientists located in St. Paul, MN.

Department of Public Health Guidelines for the Safe Handling Of Drinking Water, Ice and Dispensers

If you're using drinking water dispensers on your golf course you should follow these guidelins to minimize the transmission of communicable illnesses.

Water and Ice

+ Water and ice must be from a public distribution system or an approved water supply that is tested to ensure conformity with applicable regulations.

+ The location of ice machines must be in an approved area.

Water Dispensers

+ The water dispenser should be constreucted of food grade materials and be easily cleanable.

+ The spigot should be of a gravity flow design to prevent contamination during use.

+ The dispensers should be cleaned and sanitized at least once every 24 hours. Use wash-rinse-sanitize methond for sanitizing dispenser. the compartments of the sink should be of sufficient size to allow immersion of the container. For containers too large to be immersed in the three-compartment sink, a clean and sanitize in-place procedure can be used. This includes use of a clean bucket and wash cloth for the detergent cleaning step, followed by rinsing the container at least three times with water, and finally, spraying the inside of the container and spigot witha sanitzier solution.

+ Provide an area to allow proper air drying of dispensers. Containers shall not be stored on the floor at any time.

+ Pay special attention to cleaning and sanitizing the dispenser nozzle.

The water hose used to fill the dispenser must be food grade (garden hoses are not approved) and not stored on the ground or capable of being submerged into a drain. Hoses should be used exclusively for drinking water dispenser filling and not to fill other equipment or tanks

Dispenser Filling

+ The dispenser should be filled in an area free of environmental contaminants such as dust and insects.

+ The dispenser should not be placed on the floor while filling.

+ The dispenser should be filled in a aroom with smooth, dry, easily cleanable floors, walls and ceilings. The dispenser should be kept away from chemical storage or other contaminants.

+ The water hose used to fill the dispenser must be food grade (garden hoses are not approved) and not stored on the ground or capable of being submerged into a drain.

+ Hoses should be used exclusively for drinking water dispenser filling and not to fill other equipment or tanks (such as pesticide, herbicide, battery containers or used to clean other things).

+ Plumbing code must be met to protect the water supply. (Cross connections must not be present and backflow devices are required).

+ Wash hands with soap and water prior to handling water and ice.

+ Ice must be dispensed with an ice scoop (without coming in direct human contact).

+ To prevent direct hand contact with the ice, it is recommended that employees wear disposable gloves.

(Continued on Page 15)

Effect of Clipping Management on Nutrient Runoff from Kentucky Bluegrass Turf

By Brian Horgan, Troy Carson, and Pam Rice
University of Minnesota

Introduction

Recently, the State of Minnesota passed a law restricting the use of phosphorus fertilizers applied to turfgrass throughout the state (SF 1555). Exceptions to this legislation include applying P at time of seeding or establishment, need of P based on soil testing, and/or if you are a golf course personnel that has completed a training session. As an extension turfgrass specialist, I would not recommend the use of P unless during establishment or if a soil deficiency is present. Therefore, this new legislation makes sense to me except I'm not sure that the expected results will be obtained.

The debate about restricting P use to turf centered on the actual fertilizer applied to turf. Although a scenario can be created in which the actual fertilizer prill may runoff, sound agronomic practices will minimize or even eliminate this potential. One such scenario could be: apply fertilizer to a sparse turf population grown on a highly compacted soil that is saturated which receives a large rainfall event immediately following fertilization. Many of us can think of areas on our properties where this could occur. However, experience has shown that professional turfgrass managers who subscribe to sound agronomic practices would not risk loosing product from a runoff event. Your scenario would probably be: obtain a soil test, aerify twice a year, apply fertilizer to maintain good density, and coordinate your fertilizer application so that it can be watered in with irrigation, not a large rainfall event.

Because data does not exist to prove the movement of fertilizers applied to dense turf sward, other nutrient sources must be examined. Mowing is a primary cultural practice that we can not do without. Often times, we recommend recycling clippings as a future source of nutrients. Looking back at the previously described scenario that could lead to runoff of fertilizer, could clippings also move off that site into surface water? On sloped surfaces that directly feed to surface water bodies, should clippings be recycled or removed to possibly prevent nutrient runoff and surface water contamination?

The objective of this research will be to evaluate the effect of clipping management on nutrient runoff from Kentucky bluegrass turf. The following experimental design and treatment list will be evaluated:

Materials and Methods

Proposed area for runoff plot construction is at the TROE Center on the St. Paul campus. This area will be irrigated and is currently space that has been allocated for turfgrass research.

- Construct 24 runoff plots (8 ft by 24 ft), separated by dividers to ensure that runoff is from a known area, with a uniform 6% slope, at both locations.

- To simulate homelawn conditions, the topsoil will be removed, the subsoil compacted and the areas will be sodded with a Kentucky bluegrass blend.

- This will allow 8 treatments to be imposed with three replications. The proposed treatment list includes:

1) Control - no fertilizer applied, clippings removed
2) Only nitrogen fertilizer applied, clippings removed
3) Full-rate phosphorus and nitrogen, clippings removed
4) Double-rate phosphorus and nitrogen, clippings removed
5) Control- no fertilizer applied, clippings returned with recycling mower
6) Only nitrogen fertilizer applied, clippings returned with recycling mower
7) Full-rate phosphorus and nitrogen, clippings returned with recycling mower
8) Double-rate phosphorus and nitrogen, clippings returned with recycling mower

**potassium will be applied to those fertilized plots according to soil test results*

- A rainfall simulator/irrigation system will be designed and installed to simulate rainfall events.

- A sampling mechanism will be installed at the base of each plot to measure volume of water running off each plot and collect a subsample for analysis.

- Hand held TDR probe will be used to measure volumetric water content within each plot.

Results and Discussion

This research will begin in September 2003 and conclude in December 2006. Plots will be constructed this summer and available to tour at Field Day on July 24, 2003.

(Editor's Note: Brian Horgan is an Assistant Professor and Troy Carson is an Assistant Scientist in the Department of Horticultural Sciences at the University of Minnesota and Pam Rice is a USDA/ARS Soil Scientists located in St. Paul, Minnesota.)

TROE Center Update–

(Continued from Page 1)

Bentgrass Runoff at the TROE Center. Working with USDA/ARS scientist Pam Rice. Will evaluate nutrients and pesticide movement. Each of the 24 plots are 8' by 24'.

At the TROE Center this year, we will be installing irrigation and seeding 2.5 acres of Kentucky bluegrass, installing irrigation and seeding a 40,000 sq ft bentgrass fairway, building and establishing a runoff facility to simulate both home lawn and golf course fairway conditions as well as constructing a small shed to store equipment.

So where has the $25,000 contribution (first of four installments) that the MGCSA made to the University of Minnesota turfgrass endowment gone? Well, unlike my personal investments, that money was deposited in an account on campus that guarantees a 5% return on investment. That money is growing as we continue to fundraise.

We have been doing a lot of construction and fundraising to develop and build the research center. However, we have also been writing grants and starting research projects. What is a research center if no research is performed? Five of these research projects are described in detail in this issue of Hole Notes. In the future, the June issue of Hole Notes will dedicated to the MGCSA's investment into ongoing research projects and updates on the research center at the University of Minnesota. Thanks again for your support.