

1995 RUTGERS Turfgrass Proceedings



THE NEW JERSEY TURFGRASS ASSOCIATION

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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, Cook College, Rutgers University in cooperation with the New Jersey Turfgrass Association. The purpose of this document is to provide a forum for the dissemination of information and the exchange of ideas and knowledge. The proceedings provide turfgrass managers, research scientists, extension specialists, and industry personnel with opportunities to communicate with co-workers. It also allows these professionals to reach a more general audience, which includes the public. Articles appearing in these proceedings are divided into two sections.

The first section includes lecture notes of papers presented at the 1995 New Jersey Turfgrass Expo. Publication of the New Jersey Turfgrass Expo Notes provides a readily available source of information covering a wide range of topics. The Expo Notes include technical and popular presentations of importance to the turfgrass industry.

The second section includes technical research papers containing original research findings and reviews covering selected subjects in turfgrass science. The primary objective of these papers is to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

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Dr. Ann B. Gould, Editor
Dr. Bruce B. Clarke, Coordinator

THE YEAR IN REVIEW
(or "We are the same, but boy are we different!")

Angelo Petraglia¹

Another title for my talk could have been "How I Survived in 1995--the Year of Drought, Disease, and Construction."

To answer this question I have to give you a little background on the club where I work. Deal Golf and Country Club was established in 1898, and in many ways it is typical of most private country clubs in New Jersey.

The course is not long by today's standards. It measures only 6300 yards with small greens (5,000 ft² on average) that were constructed out of soil with no internal drainage. We have approximately 25,000 rounds of golf per year. Although this may not seem like many rounds compared to public golf courses, the result is enough traffic to cause problems. Our greens lack surface drainage and are prone to compaction. The course needs modernization of the tees, bunkers, cart paths, drainage, and irrigation system.

Prior to 1990 when I started my job at Deal, the membership faced the real possibility of having to rebuild 9 out of the 18 greens. My Greens Chairman, Mr. James Whitlock, as well as the Board of Directors and my General Manager (Joseph De Kovacs) wanted to know if we could improve the existing greens without having to close them for total reconstruction. Because of my past experience as Golf Course Superintendent at Colonia Country Club and at Navesink Country Club, I was confident that it could be done.

I know my talk is about the year 1995 in review, but I could never have made it through 1995 without all the prior work that was done at the course from 1990 to 1994. During those years we had to improve the soil, drainage, and irrigation system as well as to train a crew to do the work that was necessary. I believe I have the best people working for me and the added benefit of working for great people. That can make a difficult job bearable.

Recently, the Club made a commitment to spend at least \$150,000 per year in capital improvements to the golf course over the next 10 years. Prior to 1995, most of the improvements to the golf course were in the area of drainage improvements. We made some in-house improvements as well as using the services of Pavelec Brothers Golf Course Construction Company. This was the challenge that attracted me to the job.

It is a well-known fact that even the best turf manager or golf course superintendent cannot grow grass under water...unless it's rice.

Soil Improvement Program

My first season at Deal Golf and Country Club in 1990 was one of total frustration with the *Poa* greens. Only with the help of David Oatis, USGA Agronomist, as well as Dr. Bruce Clarke and the Plant Pathology Department from Rutgers was I able to keep any turf alive on the greens

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at all. I did not want to go through another season with serious problems due to summer patch and root *Pythium*.

Through research, attending seminars, my agronomic background from Delaware Valley College, and some previous experience, I decided to use a comprehensive approach to solve the disease problems I encountered as well as to reduce the amount of *Poa annua*. I knew I had to improve the soil's physical, chemical, and biological condition.

Soil Physical Approach

Thanks to the great research that Dr. James Murphy is doing at Rutgers University, it has made it easier for me to sell the membership at my club on a frequent aerification and topdressing program using a 90:10 sand:peat mixture. This allows for a faster draining soil with more air space and enables us to overseed with new bentgrass varieties as well. Vertidrainage and backfilling with sand and Axis has been done on a once per year basis in the fall. However, this year it was done in spring and fall. This fall we backfilled with course sand and Axis, and so far this approach is working well.

Chemical Approach

With the assistance of Joel Simmons and EarthWorks Natural Organic Products Company and their soil testing service, I was able to get a better understanding of the importance of base saturation percents of my soils. Calcium (Ca) should be 60 to 70% of base saturation and magnesium (Mg) should be 10 to 20% of base saturation. The combination of calcium and magnesium should be approximately 80%. Potassium (K) should be about 5% of base saturation.

To give you an example of what I was dealing with, in 1992 my base saturation of Green 10 (which was our best green) was as follows:

Base saturation (%)		pH	CEC ^a	Humus (%)
Ca ⁺⁺	71.0	6.7	6.1	3.1
Mg ⁺⁺	19.5			
K ⁺	5.0			
H ⁺	4.5			
Total:	100			

^a Cation exchange capacity.

In 1995 the same green is now improved with the following numbers:

Base saturation (%)		pH	CEC	Humus (%)
Ca ⁺⁺	73.9	6.3	8.8	3.2
Mg ⁺⁺	13.3			
K ⁺	2.3			
H ⁺	10.5			
Total:	100			

Even though I would like to see a level of potassium closer to 5%, this green is now almost solid bentgrass with no problems due to summer patch, anthracnose, or root *Pythium*. Look at the drop in magnesium from 19.5 to 13.3%, the drop in pH from 6.7 to 6.3, and the increase in calcium from 71.0 to 73.9%.

You might ask why the potassium level is low. We apply Earth Works 5-4-5 fertilizer and we supplement with potassium sulfate fertilizer in the spring and fall. We use only high calcium lime or gypsum as a calcium source. An answer might be that potassium is much more mobile than you think.

Chemically, with the increase in calcium and the decrease in magnesium, we are improving the drainage of the soil. In addition to the increased physical drainage of the soil, we are now seeing potassium leach out at a faster rate. Yet plant potassium levels differ by only 4% from ideal as indicated by tissue testing results in August.

If we find that magnesium levels are greater than 15 to 20%, we don't use dolomitic lime, which is high in magnesium. In this case we use only Hi-Cal lime or gypsum, and foliar feed with calcium at the rate of 5 to 10 oz per 1000 ft² per month. If necessary, we apply 1 to 2 oz of magnesium per 1,000 ft² per month.

Biological Approach

While attempting to improve the soil's physical and chemical status, I also wanted to improve the biology of the soil. This is harder to define because the only measure of biological activity in a soil test is the percent of humus in the soil. Humus not only improves the cation exchange capacity (CEC) and drainage of a soil, but also acts as a food source for microbes. These microbes break down fertilizer into components easily absorbed by plant roots and may also suppress plant diseases.

In 1992, the CEC of Green 10 was 6.1 and humus was 3.1%. In 1995, the CEC of Green 10 was 8.8 and humus was 3.2%.

A small percent increase in humus makes a big difference in CEC. The percent humus was increased by using organic fertilizer. We are using a 90:10, sand:peat topdressing which has a low pH, low CEC (0.7), low humus (0.5%), and poor base saturation profile. So building humus is especially important to us.

What I am looking for in a fertilizer is not only food for plants, but also food for microbes or at least something that is not going to harm organisms in the soil. That is why I avoid the use of

potassium chloride. Also, to improve the color of the turf, I am now using more manganese and less iron and spoonfeeding nitrogen in our spray program.

1995 Water Management Year in Review

As difficult as this year was with the drought in our area (a 20 inch deficit for the 12-month period between September 1994 and September 1995), it would have been even worse if too much rain had come at the wrong time. The high heat and humidity of July and August were perfect for brown patch and *Pythium*, especially if too much water was applied.

Of all the irrigation applied to turf this year, one-third of it was during the daytime hours of 11 a.m. to 3 p.m. This was done to cool the turf during the day and to allow it to be completely dry prior to nightfall. This reduced the severity of disease. We were also fortunate to have an ample water supply from Deal Lake, although the water temperature was in the 80°F range.

Hand watering of greens occurred as a daily routine with the crew. Instructions were to either:

1. water high spots only
2. water green banks only
3. cool off the entire green but walk fast
4. a combination of the above instructions.

If greens were watered at night (4 a.m. to 6:30 a.m.), it was only for a 5 to 7.5 minute duration. In addition, irrigation times for fairways were reduced from 15 to 10 minutes at night, and fairways were cooled off by syringing only during the day. Our total irrigation use this year increased only 17% compared to 1994 (22 million gallons this year). Not bad for a drought year!

1995 Insect Control Year in Review (IPM Really Works)

I think we all wish IPM would work as well with diseases as it does with insects and weeds.

Sod webworm in greens

We applied the parasitic nematode Vector in early May (5/11) at the rate of 3 cases per 120,000 ft² and only had to control sod webworms with Dursban on two occasions this year. In other years we have had to apply Dursban on a monthly basis (a savings of four sprays).

Grubs in greens

In 1993, we had a Japanese beetle grub attack in two of our greens, and since then we have sprayed Merit in June or July. We have had no problems since.

Grubs in fairways

One application of Merit sprayed on May 30 gave excellent control of Japanese beetle grubs and atenius beetle grubs all season. No other insecticide applications were made.

Grubs in rough

We had our share. There has been talk of expanding our Merit treatments to the entire roughs as well. I have been resisting this suggestion since I don't think the economic threshold has yet been met.

1995 Weed Control Year in Review

My theory has been to keep the roughs free of weeds so that fewer problems develop on greens, tees, and fairways. Grassy weeds such as crabgrass, goosegrass, and dallisgrass (perennial paspalum), and broad leafed weeds such as clover, dandelion, and plantain are controlled each year with the spray services of Plant Food Co. and 3.5 inch height of cut in the rough.

We typically apply a combination of pendimethalin and 15-5-5 fertilizer twice in the spring. This year, we applied the full rate on April 10 and a one-half rate on June 12. In addition, we normally apply a weed control treatment once in the fall (mid-September), but this year we used a full rate of Trimec and a 15-5-5 fertilizer on October 23rd. These treatments supply all the fertilizer that is needed in the roughs all year, and keeps weeds out of not only our roughs, but out of our greens, tees, and fairways as well.

Clover in fairways

Once per year, a 4 oz per acre rate of Banvel is applied with a fungicide during the hot weather. It is amazing how well this treatment will knock out the clover without harming the bentgrass. Very little pesticide is used and the cost is low.

Crabgrass on approaches

After four years of not needing a preemergence herbicide on our fairways or greens, we finally had a problem on the approaches. This was taken care of very well with an application of Dimension plus a granular fertilizer.

Poa

Poa is still the No. 1 weed problem on my course. However, our frequent overseeding program (six times per year), works well on greens, and we spot seed fairway areas as often as we can (usually twice a year with a full overseeding once a year).

1995 Disease Control Year in Review

Protect the Bent and let the *Poa* be spent...to a certain extent.

Greens

Preventive control of brown patch and *Pythium* was achieved by applying a combination of Aliette and Fore (4 and 8 oz per 1000 ft², respectively). We sprayed twice in July, once in August, and once in September. Summer patch was controlled by applying a 4 oz rate of Cleary 3336 (with an additional 2 oz of Banol for the control of

Pythium) twice in August. In September, anthracnose basal rot was controlled with a combination of Bayleton and Daconil (2 and 4 oz per 1000 ft², respectively) or Cleary 3336 and Daconil (4 and 5 oz per 1000 ft², respectively).

We allow a certain amount of *Poa* to die in the summer (enough to thin it out and make room for our new bentgrass to fill in from our frequent overseeding program). We lost some playability only on Greens 13 and 15. Our traditional problems with Greens 4 and 5 (which are prone to flooding) were the least troublesome ever. Keeping them dry at night and cooling them off only during the day was the answer.

Fairways

There was a week in late July when we sprayed the fairways on Monday with a combination of Subdue and Daconil (1 and 5 oz per 1000 ft², respectively), and then sprayed again on Thursday with a combination of Banol and Prostar (1.33 and 2.64 oz per 1000 ft², respectively) to knock out a rampant outbreak of brown patch. The Banol was needed for additional *Pythium* protection.

Due to a high percentage of bentgrass, our fairways were in good shape all year. The difficulties we experienced with localized dry spot in 1994 were greatly reduced this year by applying a wetting agent in early spring and repeating on a monthly basis.

Tees

Very few problems were seen on tees this year. The new tees on Holes 6 and 9 were excellent from day One.

1995 Golf Course Construction Year in Review

At private country clubs these days, it is common to have "two seasons." You have the "golf season" and the "construction season." Unfortunately, you cannot control when one season ends and the other one begins. This year, our construction season was in May and June--the same time as our prime golf season!

We hired Pavelec Brothers Golf Course Construction Company to build two new 5,000 ft² tees which both required 3,000 cubic yards of earth moving. New bunkers were built on two holes, and drainage work was also required for these areas. Middletown Sprinkler was hired to install automatic irrigation systems for the new tees, tee banks, bunkers, and also for restoration of the earth moving site as well as three existing greens. Carl Fraley & Son Construction was hired for the cart path work and to install concrete pipes used for creation of a stone walk bridge.

Sod for the tee surface was purchased from Stormy Acres Turf Farm. Sod for the banks was purchased from Novasack Brothers, Clarksville Sod, and Tuckahoe Sod farms. We used 10,000 ft² of Penn Links washed bentgrass, 60,000 ft² of Rebel Jr. tall fescue, and 10,000 ft² of a mix of fine fescue and Kentucky bluegrass (60:40) for a severe slope on the west side of No. 9 tee.

Some of the advantages of doing construction work in May and June include:

1. Since construction is completed faster than if done in the spring, fall, or winter, the turf is in play faster.
2. The weather is better for construction, and the soil dries faster and is usable more quickly after rain.
3. Sod roots into the soil faster. The new tees were in play three weeks faster after sodding.
4. The contractors we wanted to use were available at this time.
5. Our members saw the work progress as it was done.
6. Inconvenience to the members was kept to a minimum. We used temporary tees that had been built a year in advance (which were excellent playing surfaces). Temporary greens were rarely used.
7. Other than the laying of sod, no construction took place on weekends.
8. We had our full crew in place to assist in laying the sod and watering it until the automatic irrigation system was operational.

1995 Year in Review (Conclusion)

This year was made possible because of the following:

1. An understanding and supportive wife.
2. An understanding and supportive membership.
3. Good communications with my Greens Chairman, General Manager, Golf Professional, and Board of Directors.
4. Two of the best assistants, mechanic, and crew a superintendent can have.
5. The best contractors in the business.
6. The best service from suppliers, distributors, and manufacturers.
7. The best technical information and advice from Rutgers University, USGA, GCSANJ, GCSAA, and NJTA.
8. Sundays off to go to church, regroup my thoughts, reflect on the people around me, and pray for strength, wisdom, and patience.
9. My son and six of his friends (whom my wife and I taught to play golf this year). To see the game of golf through their eyes made it easier for me to keep my enthusiasm for the game, my job, and my life.

10. My Greens Chairman, Mr. James Whitlock, who has attended EXPO and who is informed, interested, understands our profession, and, most importantly, who works hard because he wants his club to be the best that it can be.