



# Tee to Green

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## Late Fall Fertilization: Like Money In the Bank

by James T. Snow

Director, Northeastern Region, USGA Green Section

OCT 02 1987

MICHIGAN STATE UNIVERSITY

Did you ever think about how applying fertilizer in late fall is a lot like putting money in the bank? More than twenty years of research and experience indicates that this just might be so. Just as an individual's savings account will earn interest and grow, leaving him fiscally healthier than before, late fall fertilization works underground to promote root, tiller and reserve carbohydrate growth which in the spring produces stronger, healthier turf.

Confusion has reigned for many years about what late fall fertilization actually means. It has been referred to as dormant, semi-dormant or sometimes simply fall fertilization, with perceptions of application dates ranging from early October through Christmas. In reality, a late fall fertilizer application should be made after topgrowth has ceased but before the ground freezes and root growth has come to a halt. A good rule of thumb suggests making the application at about the time the turf is mowed for the last time of the year.

The concept of late fall fertilization has become popular only during the past five to ten years, even though promising research work was being reported in the mid 1960s. Prior to that time it was felt that applying fertilizer after mid September would greatly increase the risk of winter injury. This turned out to be of concern only when heavy rates of nitrogen fertilizer were applied during mid fall, in time to produce lush, succulent topgrowth

and a loss of carbohydrate reserves prior to the onset of freezing weather. By making the application at about the time of the last mowing, turfgrass roots are still active enough to take up nutrients for use and storage at that time, while the chance of producing lush topgrowth is essentially nil.

Among the benefits of late fall fertilization are increased root and tiller development, improved winter color, earlier spring greenup, better turf density, and less spring topgrowth (compared to early spring fertilization). Negative effects include the potential for increased winter and early spring disease activity, though normal applications of fungicides usually minimize this risk.

A very informal survey of golf course superintendents in the Northeast found widely varying views and practices with respect to late fall fertilization. Some utilized the practice only on greens, others only on tees and fairways, still others on everything, and some not at all. Nitrogen rates varied from as little as  $\frac{1}{4}$  lb./1000 sq. ft. to as much as 2 lbs./1000 sq. ft., and fertilizer sources included practically everything available for use on turf. Some thought that late fall fertilization is a great program and does wonders for their turf, while others felt that the practice does little but promote *Poa annua* and encourage winter injury.

After years of observing the results of superintendents who have utilized the practice faithfully and reasonably, I

believe that the positive effects of late fall fertilization far outweigh the potential disadvantages. Those who feel that they just haven't seen the results should try it again, perhaps using different fertilizers or rates. Theoretically, slow release soluble sources of nitrogen such as IBDU, which depend primarily on water availability for release, should be among the best choices for this program. In addition, fast release soluble fertilizers such as urea, ammonium nitrate, etc., should work well, though the potential for leaching or runoff losses of nitrogen are greater with such materials. Fertilizers which depend on microbiological activity for release of nitrogen should be the least effective due to the cold temperatures which usually exist in late fall, though many superintendents report having very good results with materials such as Milorganite.

Guidelines for rates of application vary, but the application of  $\frac{1}{2}$  lb. N/1000 sq. ft. for fast release sources and 1 lb. N/1000 sq. ft. for slow release fertilizers is a good place to start.

In principle, the practice of late fall fertilization makes a lot of sense. By experimenting with different fertilizer materials and application rates, it should be possible to establish a program which yields the many benefits described previously. To the superintendents who enjoy these benefits as spring rolls around each year, late fall fertilization is like putting money in the bank.





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*We are sorry to report that contributions to the MGA's Tufgrass Research Fund have been very slow in coming. We, the MetGCSA, are asking that all Class A members recommend to their club that they contribute to this worthwhile research project for our local benefit. Below is a summation of Dr. Humme's efforts on our behalf.*

## Moss Infestation Of Putting Greens Research Project Update

Dr. Norman W. Hummel, Jr.  
Cornell University

The moss control project, funded by the Metropolitan Golf Association progressed well in 1986. The first phase of the study, which included an evaluation of soil related factors, was completed while the chemical screening phase of the study was initiated.

The objective of the first phase of the study was to determine what, if any, soil related factors may be giving the moss a competitive advantage over bentgrass. The purpose of evaluating these effects was to identify potential cultural controls worth testing in the field.

Through 1985 and 1986, several golf courses were visited to collect soil samples for chemical and mechanical analysis. Maintenance histories were also obtained from golf course superintendents visited. Soil samples were taken from greens with and without moss. Chemical extractions of the soils were made to determine the nutrient content within each of the soils.

From discussions with golf course superintendents, it was apparent right away that the two major factors, contributing to moss infestation on to greens was the low fertility (average 2.1 lbs. actual Nitrogen per 1,000 square feet per year) and low mowing height (1/8 inch). It is likely that an easy solution to the moss problem would be to raise the mowing height and increase the fertility. However, today's golfers are demanding faster greens and many golf course superintendents are forced to maintain championship speeds on their greens throughout the year. There were some other soil factors, however, that do appear to influence whether or not a green will be susceptible to moss encroachment.

Contrary to popular belief, the presence of moss was not at all influenced by pH. Silvery thread moss (*Bryum argentum*) was rather insensitive to pH. The only soil related factors found to have a significant influence upon moss were potassium, iron and the percent fines (silt and clay) in the surface 2 inches.

Phase 1 of the moss project enabled us to identify a number of factors that will be looked at in cultural studies in the field. A study will be established at Woodmere Country Club that will include 3 cultivation practices, including deep spiking, light frequent topdressing in conjunction with core cultivation, and core cultivation alone. On top of the cultivation treatments will be a series of plots with various nitrogen, iron, and potassium rates.

### Chemical Screening

In 1986, a study was conducted to evaluate several chemical control methods for moss. The study was conducted on a chipping green at Woodmere Country Club, Woodmere, New York.

### Conclusions

The surveying and soil analysis work surfaced a number of potential cultural variables to test in the field. While mowing height and nitrogen fertility levels were very consistent on greens with moss problems, it is unlikely that any change in cultural program that decreases green speed will be a viable means of controlling moss. Factors that have shown to be an influence on moss that will be tested in the field include cultivation, modification of the surface 2 inches of the soil, and potassium, nitrogen and iron fertility.

Many more herbicides need to be screened in the greenhouse before the current field test can be expanded. However, at this time, hydrated lime and mercury fungicides show the greatest potential for selective control of moss in greens. I must emphasize the point that the use of mercury is illegal in New York State and superintendents should not use it for moss control at this time.

Contributions are \$100.00. Anyone needing further information is asked to contact Gene Westmoreland, MGA Assistant Executive Director, at (914) 698-0390.

# Use Of The Computer In The Budgeting Process

By Joseph Alonzi  
Fenway Golf Club

In 1984, my first year at Fenway Golf Club, one of my first responsibilities was to prepare the budget. Although I had prepared budgets each of my previous ten years at Huntington Crescent Club, I found that my format had to be revamped. Union benefits, different overtime rates, different departmental expenses, a changeover from one Jacobsen F-10 to three Toro Pro 84's (which required more man hours and more maintenance) all led to about 75 hours of intensified calculations. After that came the cutting process which, in turn, led to more time spent dividing and subtracting.

To me, this was a frustrating ordeal. The following year, 1985, promised to be the same except that the format would be left alone. Every new program required more manpower, more equipment, more supplies, etc. As a result, through 1985 I spent much of my time with calculator, pencil, paper and the previous fiscal year's expense records.

In mid-1985, after much research, discussion and thought, Fenway decided to replace its deteriorating irrigation system with a new one — the Toro Network 8000 centrally controlled by an IBM Personal Computer XT. It was this decision that simplified my budgeting process.

First, I purchased several software packages, one of which was a Lotus 1-2-3 chosen for its spreadsheet capabilities. Coincidentally, my brother Bob had recently computerized his operation and was also using a Lotus 1-2-3 for his budget. As our formats were relatively similar, I copied his budget on my diskette and installed it in my computer. This saved weeks of programming because I just could not spend more than an hour or two a day on budgeting. With the format in place, it was merely a matter of changing names, costs, hourly rates, pesticides, fertilizers and miscellaneous supplies, etc. Once all the information was loaded into the computer, a complete report was printed which I submitted to the Finance Committee for review. Any changes that were needed at this point required only minutes to make.

Future budgets will require only number changes because all mathematical formulas are kept "in memory." For example, to figure hourly wages, you need only to type in the hourly rate which the computer then multiplies by 40 hours by 52 weeks by the number of men. The same holds true for any category on any line in the budget.

Formerly, when cuts were contemplated, it was difficult for a Committee to decide

which programs should be cut and which should be retained. The fascinating part about a computerized report is that its detailed nature results in fewer revisions.

Because computerizing the budget has reduced its actual preparation time by 75%, it is not the only part of our operation that is now computerized. All equipment inventory records, actual expenses to compare with projected expenses, prices of all supplies, pesticide records, bid lists, all correspondence and even an inventory of our tree program, are kept in "in memory."

The computer age is upon us and at some point in the future I feel certain that a computer in the Superintendent's operation will be a required tool much like mowers, rakes and golf carts.

## Leo Feser Award Judging to Begin

Members of the GCSAA Communications/Awards Committee already are busy reviewing articles written by members and published in *Golf Course Management* magazine to determine who will receive the coveted Leo Feser Award at the GCSAA International Golf Course Conference and Show next year in Houston.

A list of articles published so far this year—along with names of authors, the month of publication and page numbers—was to be sent to the committee with forms to help in the judging process.

The cutoff is the October issue. Another list will be sent to the committee at that time. Committee members will submit their recommendations to Chairman William R. Roberts, CGCS.

The Leo Feser Award recognizes the author of the superintendent-written article that is deemed best of the year by the committee.

The previous winner—David Harmon, golf course superintendent at the Golden Horseshoe Golf Course, Williamsburg, Va., received his award last winter in Phoenix. His article was titled, "professionalism—That Elusive Intangible."

### Coming Events

#### SEPTEMBER

17	MetGCSA Meeting	Greenwich C.C. Paul Caswell, Sup't
28, 29	3rd Annual Golf Course Sup't. Autumn Classic	The Quechee Club Quechee, Vermont

#### OCTOBER

21	GCSANJ Meeting	Ridgewood C.C. Ed Walsh, Sup't.
22	MetGCSA Meeting (Green Chairmen Meeting)	C.C. of Fairfield

#### NOVEMBER

9-11	Penn State Golf Turf Conferences	Penn State University University Park, Penn.
23-24	GCSAA Regional Seminar: Assistant Superintendent Functions and Responsibilities	Cromwell, Conn.



## Superintendent's Profile

By Paul Caswell Greenwich C.C

September's meeting will be held at Greenwich C.C., Greenwich, Conn. The host Superintendent is Paul Caswell.

\* \* \*

As a student at the University of Rhode Island, Paul Caswell was majoring in Agricultural Business, with a minor in Agricultural Science. It was Dr. Skogley, his advisor that steered him towards more of a hands-on career—golf maintenance. His first job was at Woodway under Sherwood Moore. The superintendent's position at Oranoke Village (a course under construction in Stratford) followed, and in 1974, Paul became the superintendent at Greenwich.

Built in the 1890's as an informal 7-hole club, Greenwich is one of the four oldest in the area. It became an 18 hole course in 1912, with architectural contributions from Seth Raynor, Donald Ross, Trent Jones, and Geoff Cornish. During his tenure, Paul has also enlarged several tees.

A member of the GCSAA, CAGS, MGCSA (currently serving on the Membership Committee), Paul feels that dedication is the most important quality to being a successful superintendent. In his spare time, he enjoys "any sporting event," and is a '40's and '50's classic movie buff. His only son Chris, 17 will be an incoming freshman at Cornell this fall, majoring in engineering.

Mary Medonis  
Assistant Superintendent  
Westchester County Club



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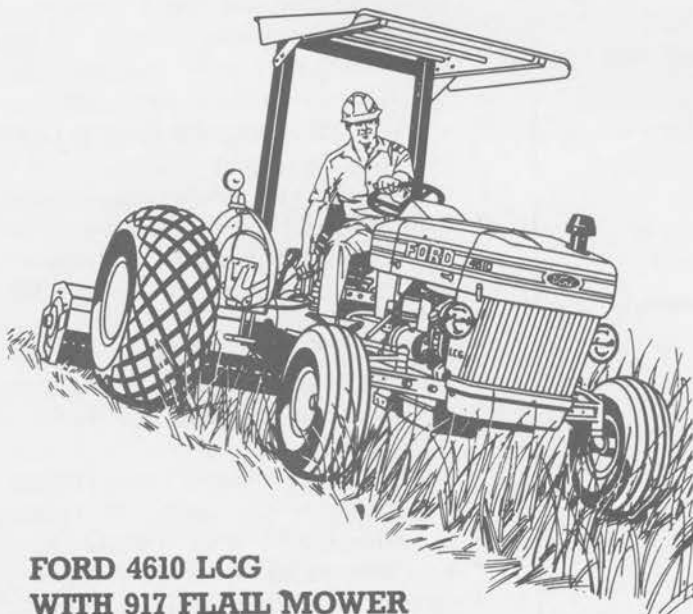
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# Landscape Design Principles

By Tony Baviello

Greens, tees, fairways and rough are only part of a golf course. The areas along the tees, the clubhouse, halfway house, tennis courts, and pool all contribute greatly to the beauty of the course. Their aesthetic value should not be ignored or compromised, therefore it is these areas I would like to focus your attention on.

The first thing to do is to decide what it is you want to accomplish. You should be asking yourself a series of questions – Do you want a screen to cover an area? Do you want this screen to flower? If yes, at what time of year? Do you want it to be evergreen or deciduous? etc. After these questions have been answered, you have already narrowed down your possibilities by eliminating a lot of small trees and shrubs. The next step is to find out the soil conditions, the amount of light exposure and the air movement. Plants that are placed in the proper conditions will thrive intensely. A good growing plant is a healthy plant. This step will narrow down the possible plant material even further.

You want to shape the land in order to enhance its natural features. Unless you decide to focus attention on one particular feature, take care not to plant in such a way that its abruptness stops the eye. The best way to avoid this is by planting in such a way that your eye moves in a flowing motion. The idea is for your eye to focus on a point, such as a specimen plant or a group of plants then be quickly moved to the direction you desire. For example, to help direct people where you want them to go there may be a planting along side the tee – a specimen plant, then a series of plants in a flowing motion directing your eye from the tee to the fairway. To accomplish this effect you must start with the specimen or grouping of plants. Through the use of different heights of plants and changes of elevations you can move the eyes from a tall plant to a smaller plant to a ground cover and then back up to a tall plant, thus keeping the motion flowing. Plants are not the only material that can be used to make a landscape flow. Rocks and logs

can also be very effective in creating this effect, just apply the same principles.

When designing around the clubhouse, swimming pool and tennis courts you would use the above method for selecting plants with a few different rules. You want to select and design your plantings in such a way as to hide the harsh architectural lines, such as either sides of a doorway, the corner of a building, heating and cooling units, etc. Any man-made structure that makes your eyes stop and look with an unappealing response should be considered. You should be able to direct people's attention to the entrance of the building for example, rather than the heating unit. The same methods as previously discussed apply here to get the eye flowing in the right direction. Always remember that selection, size elevation

and variety should be best suited to the situation and to help enhance the natural features already there.

There are just two other points I would like to touch on. First is the planting bed that the landscape is in. They should always be contoured. Straight, rectangular and square beds are too formal, making the eye move in a straight line lacking depth and dimension. Second is the use of lights in a landscape to help create a mood. Bright lights can be used to direct your eye to certain place, while light blue and red give a softer more glowing landscape.

I hope golf course managers will better understand the need for and purpose of a beautiful landscape design and that these few pointers will help you in your endeavors.



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## Final Results

### Championship Flight: (Gross)

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John Carlone	163

### Class A (11-18 Handicap)

Tim O'Neill	137
Greg Wojick	149

### Class A (19 and Over Handicap)

Robert Alonzi	145
Robert Tosh	78

### Class B

Charlie Siemers	146
Matt Ceplo	150

### Class C

John Montecalvo	69
Robert Lippman	65

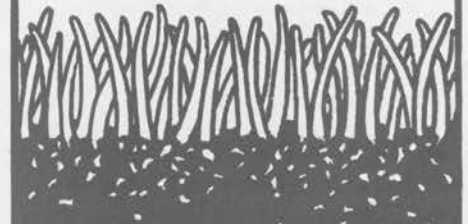
The following six people will represent the MetGCSA in the Eastern Chapters Team Championships in October:

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John Carlone

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Larry Pakkala  
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# Trees

### EPA Announces Action On Cadmium

by Robert L. Kovach Mechanic  
Innis Arden Golf Club

Use of cadmium in the environment has been prohibited under a federal regulatory order announced Aug. 10 by the Environmental Protection Agency (EPA). The sole exception to this regulatory order allows use of cadmium fungicides on golf course greens and tees under certain circumstances.

Specifically, cadmium use will be allowed on greens and tees only with a "miniboom" sprayer, and applicators must wear protective clothing during mixing, loading and application of the product. Homeowners, turfgrass managers and other users of cadmium fungicides will be forced to seek alternative materials for the control of fungi on turfgrass. Additionally, use of cadmium on fairways and other golf course areas except greens and tees is prohibited.

The decision to exempt golf course greens and tees relies in part on information provided through the Golf Course Superintendents Association of America's government Relations Program. In May, members of the EPA review team were given a demonstration of the "mini-boom" sprayer at the Congressional Country Club in Bethesda, Md.

Originally, EPA proposed cancellation of all pesticidal cadmium use. However, as the EPA announcement noted: "At the time of the proposed cancellation, EPA assumed that cadmium was applied on golf course greens and tee areas with hand held sprayers only. Since that time, the agency has received new information indicating that most golf course applicators use power spray equipment, such as mini-boom sprayers"

For more information contact:

Zachary Grant  
Manager, GCSAA  
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