This has been a terribly hot Summer!!

Usually when Fall approaches, we like to lay back on the "Oars"!!

Results of the dry weather produced an extremely high population of weeds.

Following is a list of what's available from

TURF Supply Company.

55 Gallon Drums	**TRIMEC**	6 available @ $14.00/gal.
30 Gallon Drums	**TRIMEC**	10 available @ $14.75/gal.
55 Gallon Drum	**MCPP**	1 available @ $16.00/gal.
30 Gallon Drum	**2,4-D**	5 available @ $8.90/gal.
5 Gallon Containers	**MCPP 4 lb.**	Unlimited Quantity
5 Gallon Containers	**2,4-D**	Unlimited Quantity
5 Gallon Containers	**TRIMEC**	Unlimited Quantity
1 Gallon Containers	**BUCTRIL**	(4x1 gal.) cases, 5 available
5 Gallon Containers	**TURFLON D**	(2x2½ gals.) cases, 4 available
1 Gallon Containers	**WEEDONE DPC AMINE**	(5x1 gal.) cases, 2 available
1 Gallon Containers	**TREXSAN**	2 gallons only
1 Gallon Containers	**SUPER TRIMEC**	(6x1 gal.) cases, 4 available
5 Gallon Containers	**PHENOMEC 2+1 2,4-D + MCPP**	16 cases available
1 Gallon Containers	**PHENOBAN 8-1 2,4-D + BANVEL**	2 cases only

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HOLE NOTES

OFFICIAL PUBLICATION OF THE MINNESOTA GOLF COURSE SUPERINTENDENTS' ASSOCIATION

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FROM THE PRESIDENT'S DESK

DOUG MAHAL

As the 1987 season begins to draw down, the words used to describe it vary depending on location. Many courses received moderate weather and were able to cope with the conditions. Some, however, got a Joe Neikro knuckle ball hurled at them which left many a superintendent holding the sandpaper and emery board. Rest assured, those fall frosts will soon be arriving with regularity and, regardless of location, will be refreshing.

Our annual superintendent tournament presented contestants with an incredible test of golf. I sumbit, that socres have never been higher for this event, which confirms Robert T. Jones II's cunning in creating Edinburgh USA. Congratulations to 1987 champion Randy Nelson on an amazing score of 76 and to host superintendent Tom Fischer on the condition of that young course.

If you play the game, you won't want to miss out on our 3rd annual Harold Stodola Scramble scheduled for September 21 at the Minikahda Club. This one fills fast so be sure to send those registrations back quickly.

I was very disturbed to hear of the untimely death of Dr. Leon Snyder. As many of you know, Dr. Snyder was a monumental figure in the establishment of the Minnesota Landscape Arboretum. His contribution to that fine facility and to the green industry in general will long be remembered and recognized. Our condolences to his family and many friends.

Looking ahead, begin watching for information on our 1st annual Research Trust Tournament to be held in early October. In addition, all plans have been finalized for our annual conference on December 2-4. I hope you plan to attend both of these functions.

Pull yourselves up by the bootstraps if necessary and make the most of a normally enjoyable fall season. See you at Minikahda!

MINNESOTA'S GOLFING HERITAGE

MINNEWASKA GOLF CLUB

by DENNIS SCHOENFELDT
Head Superintendent
Minnewaska Golf Club

The idea of a golf course for Glenwood (Gateway to the park and lake region of Minnesota) originated in April 1920. The first persons interested in this idea were E. E. Kaldahl and J. E. Griffith. These two donated one summer time to removing rocks from the site overlooking Lake Minnewaska. Mr. Clark of Minneapolis was brought to Glenwood to lay out the original 9-holes. Mr. Aune and Henry Peters of Glenwood were two of the originators who helped furnish the financing and labor needed. Mr. Peters contributed a three section horse drawn lawn mower for the fairways. The land needed for the 9-holes came to 58 acres plus several acres leased to the club by the Minnesota State Game and Fish Commission. The 58 acres cost $3,231.90. The first greens were sand but the conversion to grass greens came soon after. The cost of the watering system was $3,000.00. During the winter of 1923 and 1924 the Glenwood Ski Club donated their clubhouse and was moved across the winter ice on Lake Minnewaska at a labor cost of $150.00.

The ladies of the club (membership 59) furnished the clubhouse with the needed furniture. On April 7, 1930 Tom Vardon (a nationally noted authority on golf and golf course construction) revamped the 9-holes. The par 34 and yardage of 2777 yards was changed to a par 36 and yardage of 3200 yards. In 1968 the original clubhouse was removed and a new structure was built. The Minnewaska Club today has excellent greens and summer rule fairways. The club overlooks Lake Minnewaska and without question boasts of its scenic view as one of the best in Minnesota.

I want to thank Ralph Cheeseman for helping me prepare the history of the Minnewaska Golf Club.

EDITOR'S CORNER

TOM FISCHER

With the days becoming noticeably shorter and the temperatures cooler, fall projects can begin whether it be aerifying, rebuilding tees and greens or some other special project.

It is also a time for relaxation and to reflect on one of the toughest summers during the past five years. With a summer such as 1987, it is at this time that superintendents should be called golf course managers due to managing the many aspects in our job, striving to be successful. We oversaw fertilizing, watering, chemical application, staffing, budget managing, the general public and/or private sector playing our courses, floods, windstorms and just about anything else Mother Nature could toss our way. In the future I speculate we will again be asked by the National Association to change our title to golf course manager as I feel the title is well earned and we'd gain more respect within our field of business.

I would like to thank everyone who attended the Annual Golf Course Superintendents' Tournament at Edinburgh USA on August 10. The day was a great success. There were 110 golfers playing the course and a few more for dinner. I hope a good time was had by all. A special thanks goes to my crew for the hard work they put forth in preparing Edinburgh USA for this season and for the tournament.

MTI was the distributor for the Annual golf Course Superintendents' Tournament. To them, many thanks for the prize donations of a greens cover and one year's use of a utility cart for closest to the pin on the par three holes. They also generously donated the beverages consumed on the golf course and two kegs of beer at the dinner.

The proof is in the putting.

The Greens King® IV with the revolutionary new Turf Groomer™ greens conditioner has no equal for producing faster, truer greens, *without* lowering height of cut.

This unique, patented greens care system, a Jacobsen exclusive, concentrates on troublesome thatch and horizontal runners that can slow down putting, or even throw off putting accuracy.

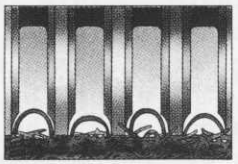
The front roller "puckers up" horizontal runners and plant leaves, readying them for clipping.

Then, the powered knife blades rotate *through* the slots in the front roller, cutting horizontal runners and removing thatch that can choke a green to death.

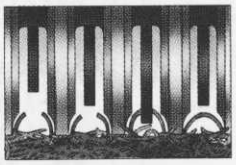
The reel follows closely behind, neatly cutting the grass while it's still standing straight and true.

The result: Faster, truer putting and healthier, hardier greens, ready for play. And, you get all this without reducing the height of cut.

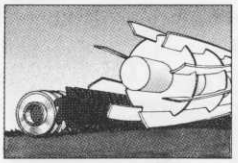
So, contact your Jacobsen Distributor to arrange a free demonstration. And, put this revolutionary new greens care system to the test on your own proving ground.



Exclusive roller design features bevelled edges to "pucker-up" horizontal runners.



The knife blades rotate through slots in the front rollers, slicing horizontal runners before they lie down.



The horizontal reel follows closely behind to clip grass while it's standing straight, for faster, truer greens without lowering height of cut.

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From the MGCSA Research Committee

NEW MINNESOTA TURF TOURNEY

The MGCSA Research Committee and Executive Board have been considering various means of raising additional dollars to set up and perpetuate a permanent Turfgrass Research Trust Fund. As the MGA Research Program has grown and the need for continued research becomes increasingly important, the concept of a Trust Fund was developed.

In order to continue our research, it is our intention to provide an annual source of revenue to sustain this trust fund in addition to our annual research solicitations. With long term research commitments often necessary we have found we cannot effectively and efficiently operate depending solely on yearly donations to sustain long range projects. This is where the idea for the Minnesota Turf Tourney was devaeloped.

The format for this tournament was adopted from a very successful Michigan Border Cities Golf Course Superintendents' Association Annual event, and it is set up as follows:

Nineteen Twin Cities area private country clubs have generously agreed to donate four tee times and eight golf cars at each of their clubs on the first Friday in October each year at noon. Members of these nineteen clubs will then, so desiring, have the opportunity to sign up on a first-come-first-serve basis to play in a four-man team event at a club other than his own on this date. The tournament would be followed with a complimentary cocktail party, dinner and prize presentation at one of the participating clubs. The dinner business would be rotated from club to club each year to those clubs desiring the business. The cost of the day would be $75.00 including golf, golf car, cocktail party, prizes and research donation. This event will also be open to all MGCSA members and their guests, providing the opportunity to tour another golf course with members or club officials that were unable to play in our annual Harold Stodola Scramble.

We would like to emphasize this tournament is not a replacement for our Harold Stodola Scramble or any other MGCSA monthly meeting or golf event. Neither is it strictly a superintendent's event; although we hope to see many superintendents and their guests participate. This year's tournament will take place Friday, October 2, 1987. Further details and entry blanks shall be mailed to all MGCSA members and to golf professionals at the participating clubs. We ask all our members to please get the word out regarding this event and we hope to see you October 2 for an enjoyable afternoon of golf.

WISCONSIN SYMPOSIUM

The Wisconsin Golf Turf Symposium will be held October 28 and 29, 1987 at the Pfister Hotel, Milwaukee, Wisconsin. Contact: Bob Welch, Milwaukee Metropolitan Sewerage District, 735 North Water Street, Milwaukee, Wisconsin 53202; (414) 225-2222.

How Soils Affect Water Usage

J. R. Watson, V.P., Agronomist
The Toro Company, Minneapolis

Water is essential for plant growth and plant activity. It is involved either directly or indirectly in all phases of the care and management of turfgrass. Water is necessary for germination, for cellular development, for tissue growth, for food manufacture (photosynthesis), for temperature control and resistance to pressure. It acts both as a solvent and as a carrier of plant food materials. Nutrients dissolved in the soil by water are taken in through the roots and then carried to all parts of the grass plant in water. The food manufactured in the leaves also is distributed through the plant body in water.

Soil affects watering practices because it is the reservoir from which the plant obtains the water needed to sustain its growth and development. Thus, effective and efficient water usage on golf courses demands a knowledge of the basic physical and chemical soil properties and how these relate to water absorption, storage and drainage as well as the frequency, rate and manner in which water must be applied to turfgrass. Further all such basic information must be correlated with the requirements for color, play or use, adjusted to fit the existing or planned irrigation facilities, and modified to suit the level or standard of maintenance at which the golf course is being kept or maintained.

Golf course soils, as for any turfgrass site, must provide support for the turfgrass, provide a firm uniform footing for the player, serve as a storehouse for nutrients, supply oxygen by providing for exchange of soil and atmospheric gases and act as a reservoir for the water used by the turfgrass plants.

The texture (size of soil particle), structure (arrangement of soil particles) and porosity (percentages of soil volume not occupied by solid particles) of a soil are the basic physical factors which control the movement of water into the soil (infiltration), through the soil (percolation) and out of the soil (drainage).

Texture, structure and porosity, along with organic matter content, determine the water-holding or reservoir capacity, control the air-water relationships and drainage characteristics of the soil. All directly affect watering practices and hence impact directly on water usage.

The intake of water is through the roots, actually through root hairs as they are the organs through which water is taken into the plant system. Hence, the depth of rooting, the extent to which a given root system occupies the soil, the age of the roots and the supply or number of root hairs all affect the depth to which the soil should be wet. The volume of soil that is occupied by active roots represents the soil reservoir for that plant. When high evapotranspiration (ET) rates occur the need for water is great and the reservoir may have to be replenished frequently, especially if the root system is shallow and the soil sandy.

For example, if the need for moisture is 0.25 inches daily, as the case may be during the heat of summer, the soil must supply to the plant, 0.25 inches of water between irrigations. Soils that are otherwise very good for putting greens may hold only 0.5 to 0.75 inches per cubic foot. This would be an adequate amount of water for one to two days if all of it were available to the plant. For this to be the case, the roots must extend through (permeate) the entire volume of soil to a depth of 12 inches. If the roots are only three to four inches, obviously the soil may have to be replenished more frequently — irrigated daily or even twice daily. With a limited root system or one that does not fully occupy the volume of soil; the soil must possess the characteristics necessary to move the needed amount of water at a rate rapidly enough to permit its uptake by the root. Generally, plant water needs can be satisfied if enough supplemental water is applied to replenish that portion of the available water in the root zone which has been used since the last irrigation. Some authorities indicate that water should be added when approximately 50% of the available soil water has been exhausted. Thus, if the roots fully occupy the soil to a depth of six inches and the soil holds one inch per cubic foot, the ET rate is 0.25 inches per day, the green must be watered daily, since 50% of the potentially available water will have been used in that period of time.

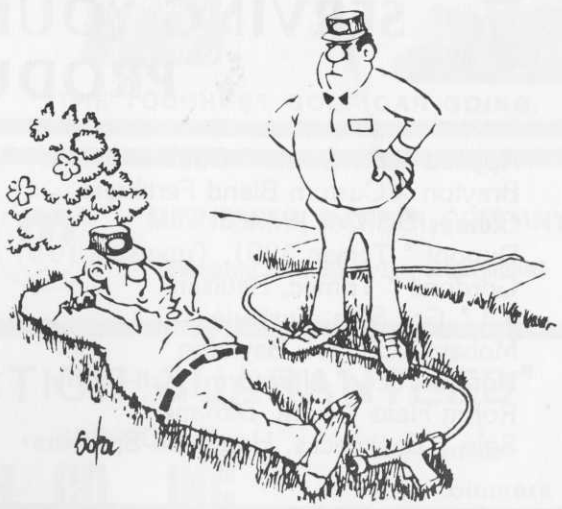
Enough water should be applied to ensure that the entire root zone will be wetted. Too, on natural soils, as opposed to those modified for intensive use (golf greens and bowling greens), sufficient water should be applied to bring about contact with sub-soil moisture. Continuous contact between the upper and lower levels of moisture will avoid development of a dry layer through which roots cannot penetrate.

Under arid or semi-arid conditions, or any location where salts may have, or will accumulate, water must be added in quantities greater than is actually required to satisfy the water needs of the grass or to replenish the soil reservoir. This is necessary to ensure periodic "flushing" of the soil to remove the salt accumulations.

Application of too much water at one time (misuse) is serious when the soil is poorly drained and the excess cannot be removed within a reasonable period of time. Such a situation is more critical in saline or salty areas or when saline water is being used. When such conditions obtain, water usage must be modified.

Soils have little direct affect on plant usage of water. Plant use of water is a solar driven phenomenon. The water evaporated and transpired as a result of this solar energy is approximately equal to that required to meet the plant's need. This relationship must be clearly understood to make efficient use of this vital, and dwindling resource.

Prepared for: Golf Architects Meeting, GCSAA Annual Conference, January, 1987, Phoenix, AZ.



"It's a new weed control technique— I smother them."

Results: MGCSA AMATEUR CHAMPIONSHIP

Championship - Gross Event

1st Randy Nelson	76
2nd Monty Swift	82
3rd Ed Bartyzal	84
4th Fred Anderson	84
5th Mark Aanes	85
6th Kevin Clunis	85
Scott Kjellberg	85

1st Flight - Net Event 9-16 Hdcp.

1st John Beyer	71
2nd Scott Liestman	76
3rd John Labore	77
4th Jim Nicol	78
5th Greg Hubbard	80

2md Flight - Net Event 17+ Hdcp.

1st Dick Grundstrom	70
2nd Fred Boos	74
3rd Bill Larson	78
4th Cliff Reynolds	78

Senior Flight Gross Event

1st Jerry Bibbey	82
2nd Tom Gibbons	86
3rd George Gibbons	87

Callaway

1st Steve Vanetta	71
2nd Tom Herzog	73
3rd Scott Melby	74
Pat Walton	74
John Granholt	74

Associates Callaway

1st Rick Garland	76
Don Herfort	76
Dave Svanson	76
Dale Wolensheck	76

Associates Handicap

1st Steve Garske
2nd Bob Neary

Par 3 Event Closest to Hole

#2 Cary Femrite
#8 Mike Redmond
#6 Jerry Bibbey
#14 John Beyer

Sulfur and the Black Layer

We have been getting mixed signals from the agricultural colleges. First we were told by Dr. Goss at Washington State that SULFUR plays a role in the suppression of poa seed-heads when applied at relatively high rates. Then Dr. Joe Vargas, not quite sure that he was getting proper suppression of poa, was actually seeing overall improvement of turf from SULFUR applications — particularly in highly alkaline soils.

These reports were enough to get superintendents on a SULFUR kick. Sales of our flowable SULFUR soared. Suddenly, we have been getting sporadic reports from various parts of the country about a BLACK LAYER. It has been identified and described quite accurately as a sealing off of the soil to the point that air is not getting down to the root system and that an anaerobic condition prevails in which microbial action is producing toxic hydrogen sulfide. The hydrogen sulfide in turn quickly reacts with most of the salts forming black insoluble sulfides. This is especially true of iron. To complicate matters, the black iron sulfide can regenerate more hydrogen sulfide under acidic conditions.

Now the pendulum has swung far to the left in the other direction. The superintendent is being told to lay off of SULFUR in any form — no more sulfates, no more sulfur coated urea, no more elemental SULFUR, as if this will cure BLACK LAYER.

SULFUR is not the cause, but the lack of oxygen is responsible. A layering of soil which prevents precolation and aeriation, can be rectified by aerification. This is a quick fix that remedies the situation, as I found out on one Southern California course last summer. Only two or three hundred square feet on three greens were involved. Within a week, aerification remedied the situation. Ironically, this course had not used our flowable SULFUR. But one can find sufficient SULFUR in the soil to accommodate the BLACK LAYER effect under anaerobic conditions.

Recent experiments reporting increased use of phosphates to help the roots to develop and grow out of this stress situation are encouraging. But this, I'm sure, must be accompanied by adequate aerification.

But where does all of this information leave ue? How are we to correct high alkaline and saline soils without SULFUR? Impossible — the only adequate products proposed for this correction — are SULFUR products.

The age old remedies of sulfate of ammonia or gypsum — both of which are acidic sulfates — have been used extensively. More recently, carefully metered dilute sulfuric acid through the fertigation system, is receiving extensive testing. Finally — one pound rates of flowable SULFUR - which oxidizes to sulfuric acid eventually -- has shown very promising results. Most important of all these remedies work under aerobic con-

ditions, but could backfire under anaerobic conditions.

Isn't it sensible to eliminate the real cause of BLACK LAYER? Excluding SULFUR products is not going to solve the problem, especially if one has an alkaline saline soil. Under this condition — the use of sulfur products is not only essential — but imperative.

Paul Sartoretto, Ph.D.

Verticillium Wilt

by James A. Fizzell
Senior Ext. Adviser, U. of I.

Leaves on a large branch in your favorite maple tree wilt, turn brown & fall in mid-summer. A plant in the barberry hedge dies, followed by death of the plants on either side. Or, a tomato plant yellows and dies just as it starts to produce fruit.

This kind of problem is a common occurrance this year. The cause is often Verticillium Wilt, a soil borne fungus disease. The soil becomes infected with the disease, when diseased plants or contaminated soil is brought in. Susceptible trees, shrubs and also garden plants growing in the soil are invaded through roots.

As well as attacking the above plants, Verticillium Wilt also attacks Ash, Box Elder, Catalpa, Cherry, Dogwood, Elm, Honey Locust, Horse Chestnut, Kentucky Coffee, Lilac, Linden Locust, Magnolia, Oak, Osage Orange, Poplar, Privet, Redbud, Rose, Russian Olive, Sumac, Tulip Tree, Viburnum, and Yellow Wood. Many garden flowers and vegetables are also susceptible.

Infected plants may not show symptoms until they are damaged or stressed in some ways. Floods last fall, and drought last winter damaged plants and hence, those with Verticillium are showing the characteristic symptoms. Susceptible tomato varieites usually succumb from the stress of fruit production. You can tell if your plant has Verticillium Wilt by cutting into affected stems. If the disease is present, vascular tissue or sapwood will be streaked green, purple & brown, depending on the variety of plant. Infected garden plants usually die from the disease, but often a woody plant wilts and recovers, not showing symptoms until stressed again. By keeping the plant healthy and vigorous an affected plant can often live out its normal life span.

A spring application of nitrogen fertilizer to trees and shrubs will promote formation of thick sapwood and may wall off further infection. Remove dead limbs, but postpone pruning any newly wilted branches to see if they will produce new leaves. Water during drought periods.

If your plant dies, be sure to replace it with a resistant variety such as Apple, Beech, Birch, Ginko, Hawthorn, or Oak (White or Burr). Most evergreen trees and shrubs are resistant. Plant only resistant varieties of garden plants.

If you are fortunate enough to have avoided contaminating your soil with Verticillium Wilt, be very selective about any plants you bring in, especially from neighbors. This is one place where it may pay to look a gift horse in the mouth.

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NEW GOLF TOURNAMENT

John Deere recently announced an agreement with the PGA of America to sponsor a Regional and National Pro/Superintendent Golf Championship. Watch for future details

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