WESTERN VIEWS

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PRESIDENT'S MESSAGE
Roger Barton

Well I can't believe its summer already. Time goes fast when you're having fun; well, sometimes it's fun. This spring has been very dry in the Grand Rapids area. I hope everyone got their projects done, as it has been good weather for construction. The board of directors of the W.M.G.C.S.A. have been working hard to put a good program together for the season, and I would like to commend them for a job well done.

I was very pleased with our turnout at Grand Haven Golf Club and our last meeting at Gull Lake View. Grand Haven was in great shape for April. Darryl and Charles Scott are a great father-son team. The golf courses were outstanding! We toured the new golf course, Stonehedge, and that proved to be another great layout.

The July 12 fishing trip will start with lunch at Spring Lake C.C. Fishing will start at Grand Haven (Bolthouse Charter) at 2 pm and go til 8 pm. This should be a good time. The August 7 family picnic is being planned at this time. We are going to have a pig roast sponsored by W.M.G.C.S.A., and a soft-ball game between the Superintendents and Vendors. More details will follow. Golf Day information will be out soon. Have a great summer!

Sincerely,

Roger Barton

Meeting Schedule

July 12 - Fishing Trip
August 7 - Family Pic-Nic
August 29 - Golf Day, Blythefield C.C.
September 20 - Annual Meeting, Sunnybrook C.C.
October 4 - Gull Lake C.C.
November 4 - Fall Party, Walnut Hill C.C.

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GOLF IN THE U.S.: A $20 BILLION INDUSTRY WITH A $40 BILLION FUTURE

JUPITER, Fla.--- Golf in the U.S. is currently a $20 billion industry that, over the next 12 years, could sky-rocket itself into the $40 billion-a-year category.

The possibility is one of several growth scenarios outlined in the recently-completed "discussion draft" of the Strategic Plan for Golf that has been prepared for the U.S. golf industry by the National Golf Foundation and McKinsey & Co., the highly-acclaimed business planning and consulting firm. The industry called upon the NGF to develop such a plan 14 months ago at the conclusion Golf Summit '86 where 250 industry leaders met to discuss issues impacting the future of the game.

The plan offers three other scenarios: One shows the industry reaching only $31.1 billion by the Year 2000. Another has it holding fairly steady at $23.5 billion, while the fourth shows it falling to $17.7 billion.

Where the industry ultimately finds itself in the Year 2000, say the planners, will depend largely on its ability to begin to manage its own future, i.e., to harness its various resources and to work collectively and effectively to address those issues that either enhance or threaten the future of the game.

One of the most significant and immediate threats is what NGF research has revealed is an impending crisis in golf course capacity that could seriously impact the nation's overall "headroom" for growth.

The related data indicates that the U.S. could find itself facing a deficit of more than 4,000 golf courses by the Year 2000 if new golf course construction does not keep pace with the projected annual increases in total number of golfers. (The U.S. golf population is expected to increase from 20.2 to 30 million by the Year 2000.) To accommodate

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'HERB' THE PARKS MAN TAKES SOME TIME OFF

CIT PATS on the back this week to George H. Filmore, who retired this month after a 41-year career with the Jackson County Parks Department.

Herb, as he's known by one and all, held the distinction of being the county's senior employee. His nearest competitors have only 30 years in county service.

Such has been his dedication to the parks that he hardly ever missed a day of work. That brought its own reward at retirement, for he received $14,000 in additional pay for sick days he never took (reimbursed on a 50 percent basis, under county rules).

If you've enjoyed the green beauty of well-kept parklands or the dazzling light shows of the Cascades, you owe a debt of appreciation to Herb. Indeed, we all do, for those areas were among his responsibilities.

Let his years of faithful service be an example to all who labor in the public interest.

—The Jackson Citizen Patriot

GOLF IN THE U.S. *(Continued from Page 4)*

this demand, planners are estimating that approximately 400 new courses will have to be opened each and every year. At the moment, however, the rate of new course construction is running closer to 125 per year.

The current preliminary draft of the Strategic Plan for Golf presents discussion outlines of 15 specific programs that are aimed not only at increasing golf course capacity and numbers of golfers, but also at increasing frequency of play among both new and existing golfers.

Completed last November, this draft is being circulated for review, comment and modification among the major golf associations, manufacturers and other leading members of the U.S. golf industry. The complete text of the discussion draft has been published in the January/February 1988 issue of *Golf Market Today*, the NGF's bimonthly newsletter that circulates nationally to its more than 5,000 members. The finalized document will be presented at Golf Summit '88 which is scheduled November 15,17 at the Marriott at Sawgrass Resort hotel, Ponte Vedra, Fla.

"The industry review of our preliminary draft is critical to the overall development of the plan," says NGF President & CEO David B. Hueber. "For this plan is not an NGF plan or a plan for the NGF... but is the industry's plan, and, therefore its development from here on must be an inclusive process."

"Consequently, in our industry meetings in the months ahead, we will be asking all to critique the work done to date; to suggest new or revised programs if necessary; to take a leadership role on programs that are of interest to them, and, in general, to become involved and thereby help make sure we have the most viable plan possible for presentation at Golf Summit '88."

In its present form, the Strategic Plan for Golf presents a comprehensive economic analysis of the U.S. golf industry as it stands today, together with projections of the potential for growth. It places total annual spending on golf and golf-related activities at $19.8 billion and identifies the major areas of this spending today as:

- Equipment ..... $2.1 billion *(Clubs, balls, bags, apparel etc.)*
- Golf Course Operations ..... $5.7 billion *(Memberships, green/car fees etc.)*
- Travel/Lodging ..... $7.8 billion
- Real Estate ..... $3.8 billion
- Media/Service Suppliers ..... $0.4 billion *(Advertising, tournaments etc.)*

Requests for copies of the current draft of the Strategic Plan For Golf should be directed to the NGF's Communications Department. *— NGF News Release*

PRUNING ORNAMENTAL SHRUBS

By Paul R. Roberts
Assistant Professor Horticulture
Meramec Community College

Spring is upon us once again. We have already set sights on our turf-care programs. However, turf is not the only plant that must be managed on the golf course. As more money is invested in landscaping, part of our efforts should include proper management of shrubs. Good pruning and care practices are essential to a healthy landscape.

Good pruning practices begin with considering pruning objectives and then following through with proper pruning techniques. When realistic objectives and techniques come together a well maintained landscape will result.

The first part of the pruning program is to consider pruning objectives. Establish pruning objectives. These objectives may include:

Objective 1) Maintain a healthy plant. This is an important objective for any plant. Be careful not to over prune, under prune or do any other activity that may prove harmful to the plant. If in doubt seek help or consult available literature.

Objective 2) Encourage/discourage growth. This objective is very important from the standpoint of growth and development. Growth is generally encouraged until the shrub attains its mature height or until the desired height is reached. During the growth period very light pruning is desirable along with other cultural practices to encourage growth. Once the desirable plant height is reached then more judicious pruning may be encouraged to control height. No matter what stage of growth the plant is in always prune to encourage the natural growth habit of the plant.

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PRUNING SHRUBS *(Continued from Page 5)*

Objective 3) Rejuvenation. When a shrub has become misshaped, ceased desirable growth, or become damaged rejuvenation pruning may be in order. This type of pruning includes removal of any amount of wood to encourage new shoots from the crown of the plant or new lateral branches from main shoots of the crown. Beside removing most of the plants lateral and central branches, cutting off all growth leaving 4-6" stubs from the crown may be necessary. Before attempting this extreme pruning be sure the plant can tolerate it.

Objective 4) Ornamental Features. Some plants are noted for their ornamental effects in the landscape. These features may include flowers, fruits, foliage and bark characteristics. Plants are selected for their ornamental value. If the plant has exceptional flowers for example, pruning should be done to encourage flower production.

Pruning at the correct time of year is essential to encouraging flower bud development. Generally, pruning after the plant has flowered is best, unless it flowers on current seasons wood. Spring flowering shrubs will set new flower buds for the following year by early to mid summer. Pruning after bud set will only remove flower buds for the next year. All major pruning should be accomplished before bud set. Only minor pruning should be done after bud set to remove excessive vegetative shoots.

When pruning for ornamental effects consider what your pruning efforts will do to the growth and development of your plants. Be sure your pruning will accomplish the desired effect.

Objective 5) Special Effects. Special effects pruning includes pruning totally out of character for the growth habit of the plant as exampled in topiary and espalier pruning. Topiary pruning is done to create various art forms including mounds, squares, contemporary shapes, and even animal figures. Espalier plants are forced into two dimensional growth patterns that are free standing or on a face of a wall. Both require much time and patience.

Once the pruning objectives are decided upon as the 'whys' of pruning then good pruning techniques are used to accomplish the objectives. Pruning techniques include those methods or practices used to meet objective which include selective, rejuvenation, and hedge pruning.

Selective pruning may be defined as the removal of individual branches or shoots. Branches are carefully chosen or selected for removal to accomplish a certain objective. By employing this type of pruning it is easy to control height, and width or generally keep the plant thinned. *(fig. 1 and 2)*

Selective pruning can therefore be used to prune for natural growth habit or to change the character of the plant slightly. Even as topiary or espaliered plants are developed a selective pruning process is employed.

By pruning back to laterals less undesirable growth results. Overall objectives are easily met and a more healthy plant results.

Rejuvenation pruning is a drastic more severe pruning that in time will renew the plant. Shrubs may be cut back to the ground (or short 6" stubs) which force new growth from the crown. As new shoots grow branches are selectively pruned thereafter to develop the shrub. Not all shrubs will tolerate this drastic pruning. With some shrubs partially reducing the height of the main shoots is more successful. With this technique there is more 'wood' to work with after the initial pruning. As new shoots develop along the stems or new shoots at the crown selective pruning can then be employed. Before pruning determine which technique the shrub can tolerate.

The third technique of pruning is hedging. Hedges may be classified as formal or informal. *(fig. 3)* Formal hedges are tightly *sheared* forming straight lines. Informal hedges are *pruned* to develop a compact plant while maintaining a more feathered look on the outer edges.

When developing either type of hedge it is imperative that the base is wider than the top. This will enable the lower branches/leaves to receive adequate light, continue to grow and compete with the upper branches/leaves. If angling the sides is not possible, at least maintain the sides vertically. Once the top grows wider than the base it is difficult to maintain a quality hedge.

Pruning plants properly is essential to developing a healthy well maintained landscape. Developing the 'whys' in *objectives* of pruning and following through with proper *techniques* is important in the maintenance program. The end result will be an aesthetically pleasing landscape.

— Gateway Green

ELECTRONIC BULLETIN BOARD FOR THE TURF INDUSTRY

TURFBYTE, the first computer accessible bulletin board for the turf industry opened its doors this month for anyone desiring to take part in a new and unique way of communicating. Centrally located in Lawrence, Kansas, it offers the turf manager a way to gain valuable information and insight through the sharing of experiences from across the country for the price of a phone call.

The use of electronic bulletin boards to trade information among persons of similar interests is on the increase nation wide. No longer just for computer experts, telecommunications is now common in all professions, and the use of bulletin boards offer a renewed sense of community in a world which has grown too large to easily assimilate. It is reminiscent of the old time "party line" concept which kept the neighborhood together through a bit of harmless eavesdropping. With bulletin boards, everyone is encouraged to listen in and participate in the discussion, though not necessarily at the same time. Being able to join a discussion at one's convenience is the real value of this type of communication and a reason for its rapid growth.

TURFBYTE evolved from an idea presented in the November, 1987 issue of Golf Course Management on telecommunications by Jon Scott, Valhalla Golf Club, and Bill Spence of The Country Club at Brookline, site of the 1988 US Open. That article interested Duane Patton of the Lawrence (KS) Country Club. With the guidance of Dale Gadd, founder of his own computer bulletin board, TURFBYTE was created. At present, Duane is the system operator, or "Sysop" in computer jargon, and runs the service on his office computer at the club. Duane, and the others using TURFBYTE, welcome all newcomers to the board, and encourage anyone with a computer and telephone modem to sign on and become a regular contributor.

"Connecting to TURFBYTE is as easy as dialing a number," says Scott. "All you need is a computer modem and some type of communications software. When a connection is made with the bulletin board, simple, friendly instructions quickly get you signed up and communicating."

A typical visit takes five to ten minutes once one becomes familiar with the system. First visits are slightly longer, but a few extra minutes reading instructions and bulletins pay off in faster visits. Messages from other users are read on command and replied to or commented on at will.

"The real value of the bulletin board concept depends on the user's participation in a discussion," Patton offers. "One subject may have as many comments or suggestions as there are users," he continues. "Messages to specific individuals can be addressed and sent very much like letters, and can be either private, seen by only the receiver, or public, shared by all. Whole text files and public computer programs, called shareware and public domain, can be sent to the board for all to download and use. Industry announcements are posted in the 'Bulletins' section for all to read on sign-on. Messages can be left requesting a return phone call at a specified time eliminating the need to play phone tag."

Patton and Scott feel the uses of the board are varied and many, depending on the expertise and needs of the visitor. "It does not take long to get started," says Scott. "The greatest fear I had was the idea that the phone meter was running, and I'd see a big bill cross my manager's desk. Now I am spending less total time on the phone than before and able to make my call when the rates are lower. That is saving money, and at the same time I am gaining valuable information I might otherwise miss."

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STRAINS OF SUPERBUGS NOW IMMUNE TO PESTICIDES

By Robert L. Metcalf

An internationally known biologist at the University of Illinois says, "Mankind may be rushing headlong back into the agricultural and medical dark age that existed before the discovery of modern insecticides and antibiotics."

According to Robert L. Metcalf, a professor of entomology and biology who discovered carbamate insecticides, "The short-sighted and irresponsible use of pesticides and antibiotics is producing strains of monster-bugs that are resistant to our chemical weapons. Some strains of insects and microbes have appeared that are resistant to nearly everything in our chemical arsenal.

The Univ. of IL biologist explained that chemicals do not always prove effective: "It is difficult to see how anyone can remain intelligently optimistic about the future of chemical control. The outlook is dismal — and getting worse." Most alarming, he said, is the accelerating rate at which insects and microbes develop resistance to new chemical weaponry. Metcalf, who has worked for the United Nations World Health Organization, cited the agency's war against malaria as one example. The disease had been nearly eliminated from many parts of the world, but has returned to ravage those areas.

In 1976, after 21 years and almost $2 billion, the World Health Organization (WHO) abandoned its malaria eradication program because mosquitoes developed resistance to virtually all applicable insecticides, and malarial parasites developed resistance to anti-malarial parasites developed resistance to anti-malarial drugs. That war might not have been lost had chemical weapons been used more wisely and carefully, Metcalf said. Their effectiveness was largely squandered by the overuse of insecticides in agriculture.

WHO's field test in Africa showed that the insecticide propoxur was extremely effective against malarial mosquitoes. However, by the time it was used in El Salvador, propoxur had lost its effectiveness. The reason? Farmers in El Salvador were already using the related insecticide carbaryl on their crops, and rain was carrying it into ponds and streams. Soon, mosquitoes appeared that were resistant to both insecticides.

"We have alternative methods for protecting crops," Metcalf said, "but we now have nothing to control malaria."

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SUPERBUGS *(Continued from Page 8)*

A sensible integrated approach to pest management, assuring optimum use of chemical weapons against pests and disease, would have avoided the problem. And it would be cost-effective. "The earliest insecticides like DDT were highly effective for many years," he explained. "The usefulness of the latest insecticides is often measured in months. An example is isofenphos, a promising corn rootworm insecticide that was withdrawn from market shelves after one year because it lost its effectiveness."

The short life of pesticides results from indiscriminate overuse, which greatly accelerates the evolution of resistant strains. Mutation can produce a gene that protects an organism against toxic chemicals. In a population exposed to these poisons, those with such genes are more likely to survive and reproduce. A case in point was the experimental reintroduction of DDT in Denmark to control flies in barns. Though it took their ancestors many years to develop DDT-resistant genes, existing flies still carried the gene, and in only months, a DDT-immune population of flies again filled the barns of Denmark.

But the problem becomes even more complicated, as Metcalf explained. The biochemical mechanism which insects and microbes employ to protect themselves against a specific toxic chemical are often effective against a wide range of similarly structured or acting chemicals. Once a bug has learned to defuse one bomb, it is better able to defuse all similar bombs. Metcalf added, "We have begun seeing insects and microbes that are virtual masters at disarming our chemical weapons." For example, the extremely destructive Colorado potato beetle has withstood 15 different insecticides since 1950. The last ditch effort was aldicarb, the insecticide that has contaminated well water on Long Island, NY. The result, after 37 years of chemical control, is a superbeetle immune to everything thrown at it.

Metcalf has long been an advocate of integrated pest management, in which insecticides are used intelligently along with other means of pest control. By using a combination of weapons, insecticide-resistant insects are less likely to survive and spread their genes.

Other techniques can also provide control, such as crop rotation, developing and planting pest- and disease-resistant crops, and using parasites, diseases and other natural enemies of pests to control their numbers. For example, farmers who alternate growing corn every other year with another crop do not have a problem with corn rootworms, one of the most serious agricultural pests in the United States. When the corn rootworm beetles emerge in the summer and lay their eggs on something other than corn, their offspring starve to death.

By contrast, American formers now spend $1 billion treating soil to kill corn rootworms and are being forced to apply greater amounts. Even so, a treatment usually kills only about 45 percent of the rootworms. A major part of the problem results from mutations taking place in the soil bacteria, which are evolving biochemical mechanisms that enable them to feed on the insecticides." If rootworms lived on instead of under the soil, where farmers could see how ineffective these insecticides are, it is unlikely they would continue to spend their money on free lunches for soil bacteris," Metcalf said.

— LAS Newsletter

BULLETIN BOARD *(Continued from Page 7)*

TURFBYTE currently supports 300 and 1200 baud modems with parity settings of 8 bits, No parity, 1 stop bit. The phone number is 913-842-0592 and the hours of operation are from 4:30 pm to 7:00 am Central Time daily. Patton is available during business hours for voice communications by dialing the same number. Jon Scott can be reached at 502-245-1715 for further information on accessing TURFBYTE.

PERMANENT SOLUTION TO DRAINAGE PROBLEMS

by John Strickland

Puddles of standing water are guaranteed indicators there's too much surface water for that type of soil to absorb and get rid of. This water is expensive to purchase, and in excess, live with. So lets get rid of it permanently!

By combining common sense and new technologies, we can rid ourselves of water that has to wait in line to get into our soil or the "good old sun" to dry up. The problem with "waiting" is that turf and ornamental plants get into trouble just about as fast as the man who is trying to maintain them for his employer. The time has arrived for turf professionals everywhere to get as tough with drainage problems as they are with disease, weeds, insects and fertility problems.

All you need to know and remember are a few basic rules about soil and you are ready to begin your plan of attack.

Soils — All soil is made up of particles of rock and organic matter in various stages of decomposition. The more particles per cubic foot, the longer it takes for water to move through that soil.

Thatch — Thatch is that layer of mostly dead plant material that accumulates on the surface of soil and that slows water down dramatically before it ever gets to the soil. Make an honest effort to get rid of it!

Equipment — The job of cutting trenches into the soil, and getting rid of the soil dug out of the trench, can be the most expensive part of doing a drainage project. Unless you really need a very deep and very wide trench, fine turf areas are not the place for tractor-loader back-hoes. Chain trenchers "out dig" back-hoes dramatically, pulverize the soil for easy removal, and come in sizes perfect to fit the job. (Lord knows we don't need 4 ton digging monsters on our oversaturated turf.) New technology has recently brought us wheel trenchers that cut very narrow trenches so fast and efficiently that the expense of digging the trench and getting rid of the soil is cut by huge amounts. Here again the soil dug out is pulverized.

Materials — The other "major expense" of a drainage project is the material you are putting back into the

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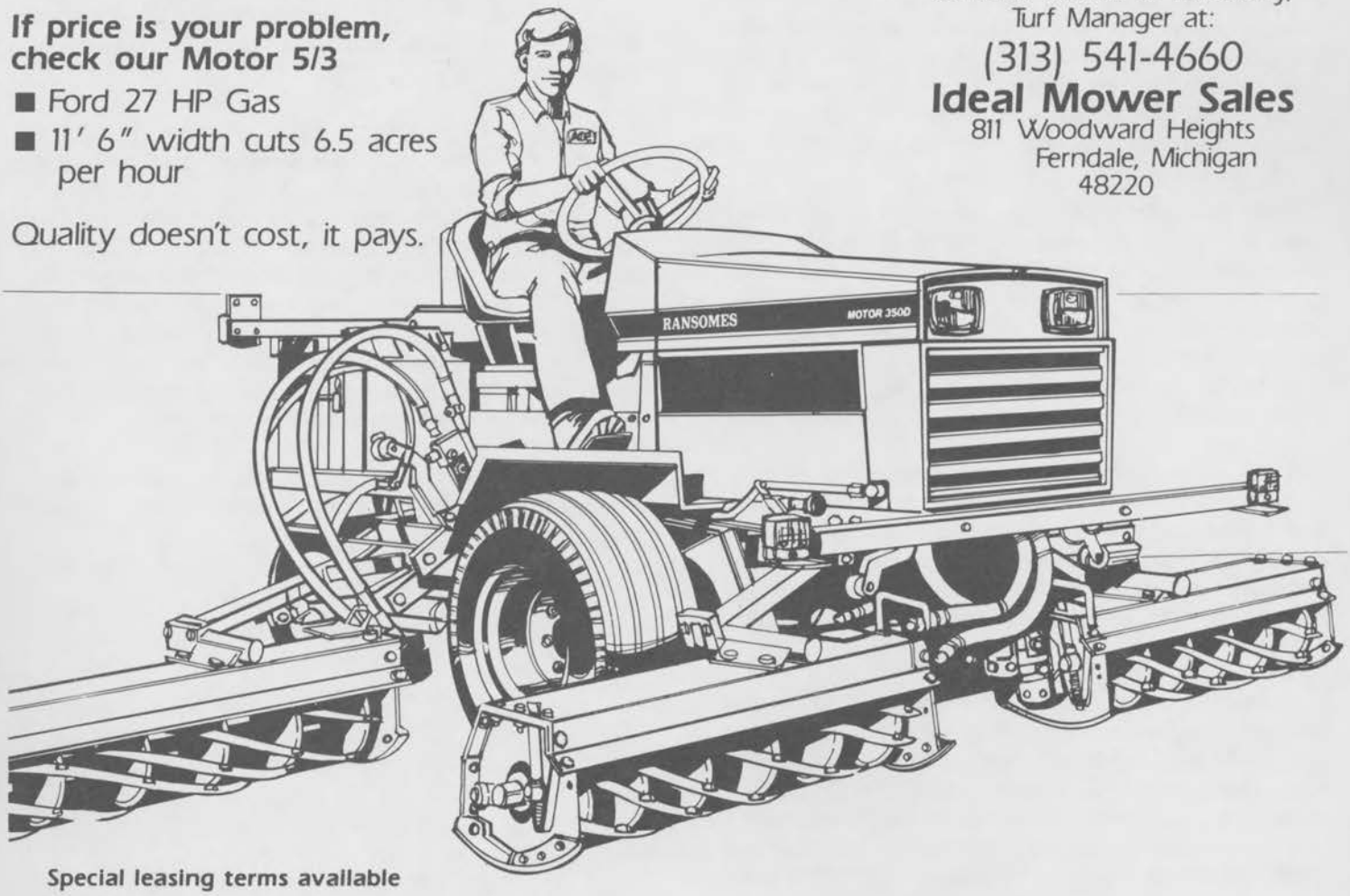

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soil to give those lazy water molecules an easier path to follow. . . to get away from our fine turf or ornamental growing area.

Crushed Agregate. . . The sharp points and corners of crushed stone keeps the stone at "arms length" away from each other. And as I stated earlier the bigger the particle size, the faster water can flow through and around the particles.

Perforated Pipe. . . Provides the "big space" in the trench for water to flow away from our drainage problem, provided we can get the water into it, and keep it from filling up with soil. (For reasons too lengthy to discuss in this article we do not recommend wrapping the perforated pipe with geotextiles. Don't use them!)

Geotextiles. . . Filter fabrics are the "saviors" of drainage systems. Skeptics, and the uninformed, contend they will clog up and fill with soil. (In some cases they might, but all geotextiles are not created equal!) You must select one that is soft, pliable, strong and "fluffy." Just picture in your mind what a cross sectional profile of a fiberglass air filter looks like. That's exactly what a proper Geotextile looks like under a magnifying glass! They can't be stiff or "slick" to the touch. The best geotextiles for drainage are engineered to permit tiny soil particles to pass right through themselves. Muddy water must pass through one side and exit the other side still carrying those tiny particles of soil with them. By using a geotextile, we insure that our crushed aggregate, and perforated pipe, will stay clean and flow excess water away fast and permanent!

When selecting a proper geotextile, ask your supplier what the A.O.S. (Apparent Opening Size) or E.O.S. (Equivalent Opening size) of his fabric is in standard U.S. sieve. Select the geotextile that has a range of 70-100. This assures you that you will be purchasing a proper drainage geotextile. (If your supplier can't supply a fabric with the 70-100 A.O.S. (of E.O.S.), don't buy it! — regardless of how cheap it is!

Some geotextiles are made from polyester, other polypropylene. Polyester "wets" easier than polypropylene, and is more desirable in drainage. It is hydrophyllic. That's a fancy word for loving water! Polyester blended into cotton makes clothing easy to launder! Polyester in drainage encourages water entry into our drainage system. Polypropylene repels water!

Space Age Solutions to Ancient Problems — In the past year you have been seeing more and more information on "Pre-Fabricated" or "Self-Contained" composite drainage systems. They are truly state-of-the-art solutions to turf and ornamental drainage problems. All employ the usage of geotextile wrapping a waffle-like core. They are comparatively thin, require trenches only 2" wide, need no connecting fittings, eliminate the displacement of huge amounts of soil and replacement gravel and the expense of perforated pipe and fittings. On a running foot basis they are up to 60% cheaper to install than conventional drainage systems! 60%! They can solve drainage problems anywhere conventional systems do, and you don't have to destroy your turf area (or take it out of play) while you are installing it. They offer drainage solutions to "reconstruction" problems.

But beware! Just like any other product you buy to achieve a desired solution, cheaper is not always better. There are big differences in these systems! One key is the geotextile (there goes that word again). Does it have the correct properties for drainage which we learned earlier? Can you interlock the waffle-like core easily to make permanent locked together butt joints? Have you taken a ruler and actually measured that core to see its true height and width? (In this instance, bigger is better.) Does the product have university testing to back up the claims of the supplier? Can you purchase this product from a supplier you depend on for service or quality products? Answer yes to the above questions and you have found the "best for your money" prefabricated drainage system.

Drainage Design — Federal laws protect our fragile environment from draining excess surface water loaded with pesticides and fertilizers directly into our natural watershed. These laws state that excess water must pass through the soil, or drainage aggregate prior to watershed entry. Exercise caution when considering catch basins, or drainage channels.

Properly designed sub-surface drainage, using the materials discussed above collects water after it percolates through soil and/or aggregates. It helps us fight the environmental battle to keep our natural resources clean longer. Identify your excess water sources. (If one happens to be the guy running the irrigation system — get him fired!) Then map your plan; and, if necessary, contact your turf supply dealer of quality drainage supplies. Please keep this last thought in mind gentle reader. The only creatures on this fragile green earth that don't get fired because of excess water problems are fish!

Puddles of standing surface water are the enemy of healthy turf, trees and shrubs. The time to declare war has arrived!

— Heart Beat

After you follow through, don't forget to follow through.

Golf Course Superintendents Association of America
Professional Golfers Association of America

WESTERN MICHIGAN GOLF COURSE SUPERINTENDENTS ASSOCIATION'S

GOLF DAY

★Monday, August 29th, 1988★

BLYTHEFIELD COUNTRY CLUB

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— Best two of four full handicap —

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- **GOLF CART**
- **LUNCH / REFRESHMENTS On Course**
- **DINNER @ 7:00 P.M. (Sharp)**
- **PRIZES**

***Players in A.M. Shotgun May Play Kent Country Club in P.M. (Cart is extra)**

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_____ 1:00 P.M. Shotgun

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Name Handicap

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Entries Must be Received by Aug. 21st, 1988

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GROUNDCOVERS FOR SPECIAL SITUATIONS

by Gary Knosher
Production Manager, Midwest Groundcovers

A well maintained turf is a compliment to any landscape. Turf's ability to withstand foot traffic and take mowing at low heights, yet look like a dense green carpet, certainly is desirable.

But there are situations where turf is not the answer. Perhaps soil conditions, or a dense shade hinder turf's performance. Maybe a steep slope makes mowing difficult or dangerous. These situations would lead to a cultural decision for using groundcovers over turf. In this brief article some of the problem areas will be identified and suggestions made as to what groundcover would do best in that situation.

When working with wet areas, consideration should be given to the degree of moisture present. If the area is submerged in water in the spring of the year, but bone dry in July and August, not many plants can survive these extremes. However, if the area stays consistently moist throughout the year (as it would on the edge of a pond), the Creeping Buttercup, *Ranunculus repens*, would be a good choice. This is a vigorously growing, herbaceous groundcover that takes full sun to partial shade. It grows to a height of 10 inches, with bright yellow flowers sticking above the foliage in May. Redosier Dogwood, *Cornus stolonifera*, would also do well on a stream bank or the edge of a pond. Cultivar variances give a choice of heights from 24 inches to six feet. Dogwood will tolerate sun or shade and have brightly colored twigs in winter. If the area is consistently moist throughout the year, but not wet, Plaintain Lily, *Hosta*, or Daylilies, *Hemerocallis*, would do well. *Hostas*, with their showy foliage, could be used in shady areas, while in full sun or partial shade, *Hemerocallis* varieties offer a wide range of flower colors, heights and times.

Just the opposite of wet areas are sunny, dry locations. Once again, there are areas that are so dry nothing can survive. If the soil drains freely, the landscape contractor should do what he can to improve it by incorporating peat moss or other organic matter. Also, mulching with bark or compost will aid in soil moisture retention. The succulent nature of *Sedum* and *Sempervivum*, or Hens & Chicks, allows them to thrive in areas that are too dry for other plants. Both of these species have showy flowers ranging in color from yellow to white to deep red. Some varieties

(Continued on Page 16)

of Sedum such as *album, acre* and *sarmentosum* can become invasive, so they may need to be restrained. *Sedum* and *Sempervivum* are both good groundcovers for sunny, dry locations. Another plant, which has potential for this type of area is Pussytoes, *Antenaria roseum*. This plant forms a dense, even blue mat two to four inches tall, and has creamy white flower clusters in May. The plant is native to the Rocky Mountains and thrives in gravelly, poor soils. At the nursery, we are evaluating this plant for introduction in the near future. If the area being considered is well drained, but has no particular drought constrictions, Junipers will do very well. Groundcover-type Junipers come in all kinds of colors, textures and sizes. They offer evergreen foliage and are very winter hardy.

Problem areas with poor soils usually have heavy clay, compacted soils, rocky or gravelly soils low in organic matter. Before planting the landscape contractor should do what he can to improve soil tilth. Plants that can survive these conditions usually need to be vigorous growers. Crownvetch (*Coronilla varia*) and Birdsfoot Trefoil (*Lotus corniculatus*) have been used by the highway departments for roadside plantings for many years. The plants' ability to grow in compacted soils, choke out weeds and provide good erosion control make them ideal for overpass plantings. However, because of their growth habit, they may not be attractive if used in the home landscape. Halls Honeysuckle vine, Lonicera *japonica halliana*, is a vigorously growing vine that overcomes poor soils. It has creamy white, fragrant flowers and a semi-evergreen habit if protected. The nodes of the vines will root wherever they touch the soil, making it good for bank plantings also. Variegated Goutweed, *Aegopodium podagraria variegata*, is a deeply rooted herbaceous groundcover that tolerates poor soils. Because of its vigorous nature, it may need to be restrained.

If the situation calls for erosion control on a bank, Lonicera *japonica halliana* or *Coronilla varia*, as mentioned before, could be used. Also *Juniperus horizontalis* varieties with their evergreen foliage and ability to root along stem make them a good choice. Purpleleaf Wintercreeper, *Euonymous fort. Coloratus*, is an especially excellent groundcover for banks because of its persistent foliage (which turns purple in the winter), vigorous growth habit, and ability to root along the stem where it touches the soil. Low-spreading deciduous shrubs such as *Cotoneaster apiculata, Diervilla trifida* and *Rhus aromatica* would also be good choices. There are many plants that could be used for this purpose, it would just depend on the other cultural conditions and aesthetic requirements.

When the landscape situation calls for a barrier, there are plants that are good groundcovers, and also act as barriers because of their thorny nature. The Ornamental Raspberry, *Rubus illicebrosus*, has a mature height of 18 to 24 inches. It is quite dense and thorny, making it difficult to walk through. Because of its vigorous growth rate and ability to spread by underground stolons, it also works well on bank plantings. The foliage is bright green and the plant has an herbaceous habit. However, the dried foliage and stems persist all winter, making it partially effective throughout the year. The flowers are white followed by a red raspberry-like fruit which is taken by the birds. Another plant which fits the bill is Memorial Rose *Rose Wichuriana*. It is a groundcover-type rose having a height of 6 to 12 inches and bright green glossy foliage. The flowers are white, single and about one inch in diameter. It is a vigorous grower with many thorns along the stem.

If the area is too shady for turf, there are many groundcovers which thrive in shade, even deep shade. Japanese Spurge, *Pachysandra terminalis*, is probably the most widely used groundcover in shade for many good reasons. It tolerates deep shade and forms a dense evergreen mat six inches in height. *Hosta* also prefers shade to partial shade. There is a wide variation of leaf colors and sizes, and also in the mature height of this plant. Barren Strawberry, *Waldsteinia ternata*, is a very good groundcover for the shade. It has dark green, glossy foliage with bright yellow flowers in May. The mature height is about six inches and is evergreen in nature. Primrose, *Primula veris*, also has yellow flowers in May, and has attractive leathery, green leaves. This list is almost endless when it comes to shade-tolerant groundcovers.

OGA Notes, Fall 1986

POOR MANAGEMENT CAN BE THE REASON FOR POOR EMPLOYEE PERFORMANCE

Has someone ever said to you, "You just can't get good help any more. I must have some of the laziest people working for me. They goof off when I am not around and they don't have any ambition or pride in their work." Whenever I hear such a statement, I am amazed at why someone brags about how poorly his employees work, I wonder whether there is a poor personnel management involved.

Most people do not purposely do a poor job. There are reasons why people perform poorly; bad treatment by managers, lack of communication between managers and employees; and alcohol, drug, financial or family problems. A potentially good employee is often wasted because managers look only at his poor performance and, not at the root of his problem. Some problems can be solved easily but others are too complex for the company to handle. However, when a manager shows genuine interest in their employees they are building employee respect for management. The company might even help develop a productive employee who might have otherwise have quit or been fired.

Low pay is the cause of many performance problems. In evaluating students who are working in the field, I have observed the results of various management philosophies. For instance, I have been on 18-hole golf courses where eight workers do an outstanding maintenance job; other 18-hole courses have trouble getting the job done with 12 employees. Often the superintendent of the golf course with the lower number of employees has the philosophy of hiring good workers and reinforcing improved performance with raises. If performance falls below established standards, the superintendent gives no raise or fires the employee.

There is a direct relationship between how hard the employee works and his salary. Knowing this, the satisfied employees take pride in their work and often do extra jobs such as picking up litter as they travel around the course. Other benefits are lower rates of absenteeism, decreased tardiness and better care of equipment.

Other golf course superintendents have the philosphy of hiring "cheap" labor and paying low wages for prolonged periods regardless of performance. When employees become dissatisfied and quit, new minimum wage labor is hired. Such a philosophy often makes it necessary for the superintendent to hire more workers to get the job done. The high labor turnover rate makes the superintendent's job harder because he has to constantly train new people. There are usually more equipment problems because the employees do not have respect for the company, and absenteeism and tardiness rates are also high.

The same problems exist in the landscape industry. Good employees often move to other jobs because management refuses to reinforce them financially as their productivity improves. Smart managers keep people who are increasing the company's productivity and weed out people who are not.

John R. Piersol, Instructor
Landscape Design and Sales/Golf Course Operations
Lake City Community College, Lake City, Florida

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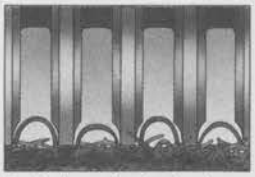

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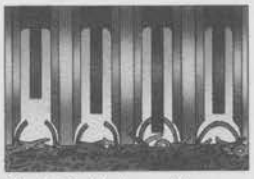

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MULCHING TREES & SHRUBS: Advantages & Disadvantages

by Thomas L. Green
The Morton Arboretum

Mulch has been defined as "any material used at the surface of soil primarily to prevent loss of water by evaporation, to keep down weeds, to dampen temperature fluctuations or to promote soil productivity." This definition would include a full range of organic and inorganic materials. Organic mulches include leaves, wood chips, bark, sawdust, perennial groundcovers, peatmoss, moss, lawn clippings, hay, straw, nut shells, grain hulls, corn cobs, mushroom compost, manure, conifer needles, newspaper, sludge, and numerous other organic by-products. Inorganic mulches, include polyethylene, river stone, crushed rock, volcanic rock, crushed bricks, ground tires, aluminum foil, asphalt, synthetic fabrics, and numerous other materials.

When mulches are used correctly they can greatly enhance plant growth and make the landscape more attractive. Incorrectly used, mulches can be harmful to plant health.

ADVANTAGES

Plants grow best when conditions are favorable for root growth. Mulches can enhance root growth by creating a favorable microclimate in the rhizosphere and improving the physical, chemical, and biological properties of the soil.

Favorable Microclimate. Few people water established trees and shrubs sufficiently during dry periods. Mulch — over a properly prepared surface — improves water infiltration and retention during the hot dry summer weather and reduces the need for irrigation. Soil moisture vapor can condense on the cooler mulch at night and return moisture to the soil. In the spring or during rainy periods, when the upper soil layers tend to be saturated, some mulches act like sponges and hold water. Unless the mulch texture is too fine, roots can grow through the upper mulch layers and receive adequate amounts of oxygen and moisture.

Soil temperature moderation is important. Mulch can keep summer soil temperatures lower and winter soil temperatures higher. Turf and bare ground temperatures in the summer often exceed the limits past which roots of trees and shrubs can live. Without snow in the winter, turf and bare ground may freeze, and when soil temperatures drop below 10°F roots begin to die. Summer heat and

(Continued on Page 22)

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MULCHING TREES *(Continued from Page 20)*

drought can kill tree and shrub roots that grew in late spring. Then they'll regrow them in the fall, only to lose them again to winter cold. This abnormal root loss requires great expenditures of energy for regrowth and winter loss may affect mineral absorption in early spring during foliation. By minimizing temperature fluctuations, mulch helps more roots survive to support top growth.

Soil Property Improvement Physical Properties. Most organic mulches are light and porous. When incorporated, they can improve the aeration of heavy (clay) soils and the water-holding capacity of light (sand) soils. Organic mulch can increase the size of soil aggregates in the surface soil and total porosity. Improved aeration favors root growth and other biological activity which, in turn, enhances soil structure. Mulch helps prevent erosion and compaction. It also prevents cracking of clay soil. Cracks increase water loss and break roots.

Chemical Properties. As organic mulches decompose they are converted to humus. During this change, much of the nitrogen, soil phosphate, sulfate, and other inorganic elements become part of the humus fraction of the soil. With the aid of various micro-organisms, the minerals of humus are made available to the roots. Also, by lowering surface soil evaporation, mulches reduce the soluble salt content which can build up to toxic concentrations during periods of low rainfall.

Biological Properties. Mulch provides a favorable environment for the growth and development of many types of soil fauna and flora. The stimulation of aerobic organisms will improve soil granulation, stability, and water infiltration. Mulch makes a favorable environment for earthworms. Research has shown that composted hardwood bark mulches can reduce root diseases; the increased biological activity is helpful in favoring decomposing organisms and reducing pathogens. Mulches reduce weed competition by inhibiting germination.

Through the millenia, organic plant material, mostly leaves, has provided the natural mineral recycling for plants. The establishment of a more natural environment for the root system will allow for optimum root growth, which in turn allows for better top growth. A healthy plant is more resistant to disease and insect attack.

DISADVANTAGES

Organic mulches are generally better than inorganic mulches. But even organic mulches can be detrimental to plant health when used incorrectly.

Unfavorable Microclimate. Excess moisture may occur with fine textured mulches, organic and inorganic. Sawdust, fine peatmoss, and grass clippings retain moisture and should not be used as a single mulching material. Also, mulches used over poorly drained soils can result in nitrogen loss (denitrification).

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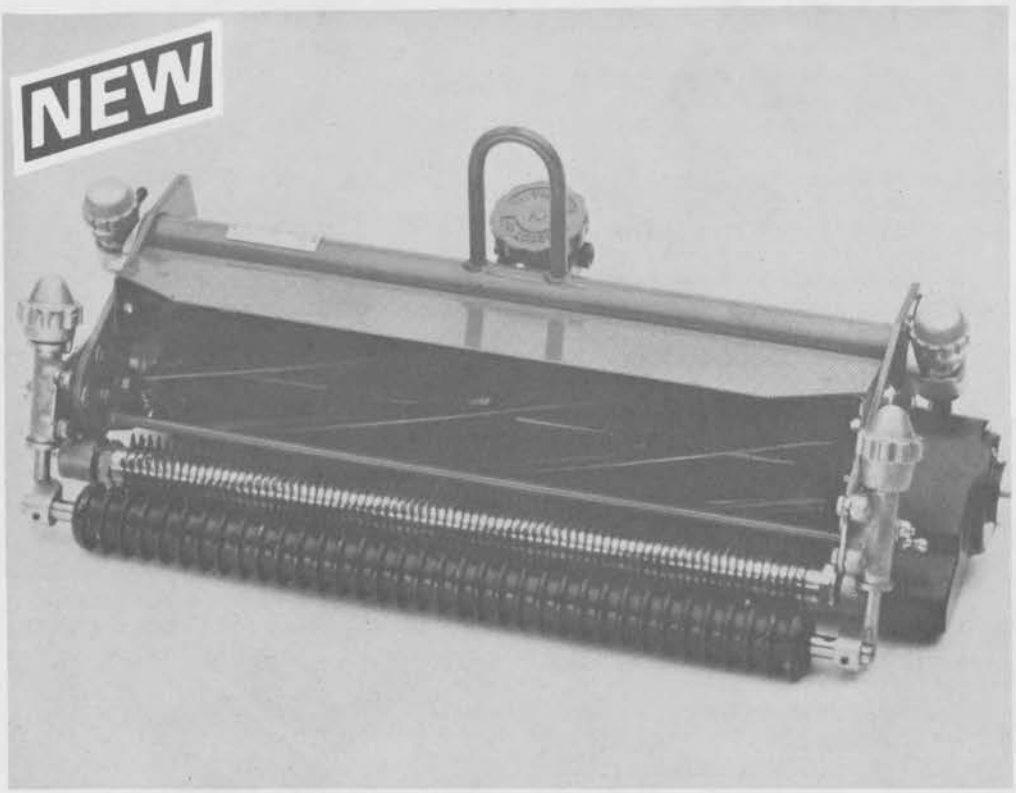

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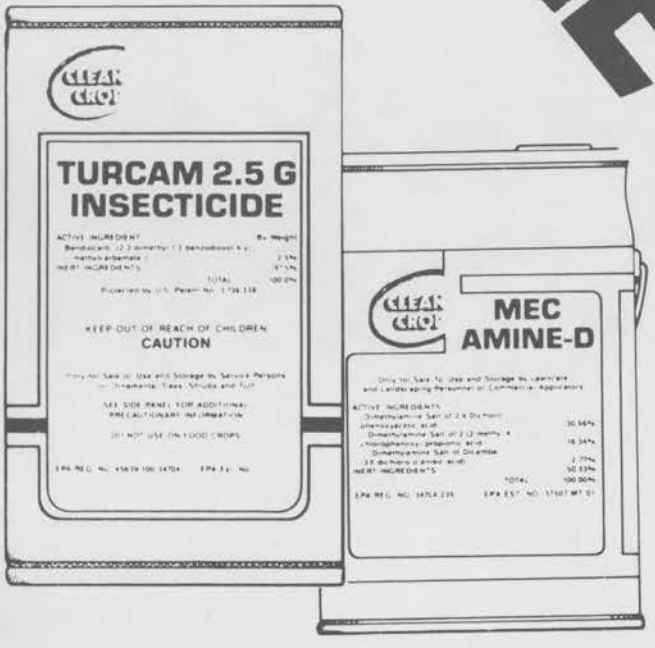

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MULCHING TREES *(Continued from Page 22)*

Moisture and oxygen deficiencies are major problems under plastic mulches. Plastic mulch is usually not recommended. If used, it must have holes to allow for water and oxygen infiltration.

Unfavorable temperatures can occur with mulch. Mulches that reflect light and heat can radiate enough heat to injure plants. Dark-colored rock can absorb solar radiation during the day and radiate heat in the evening. These mulches can stress plants and increase air conditioning costs.

Mulch insulates the soil from surface temperatures. After becoming frozen in the winter, mulch is slow to warm in the spring, which slows root growth and function. It is better to apply organic mulch after hard frost in the fall or after frost in the spring. The insulating effect of mulch can also delay hardiness development. It should not be placed in contact with trunk surfaces; this will allow the trunk base to acclimate for winter. This may be very important in grafted and and budded plants with graft junctions near the ground line. Under certain conditions, as frost occurs, the temperatures just above a mulch may be a few degrees lower than the temperatures above bare soil. This sometimes causes winter injury and bark splitting.

Nutritional Imbalance. A nitrogen deficiency may develop when fresh mulch is used. Mulch should be composted and applied to the surface, but not incorporated. If using fresh mulch, add a little nitrogen fertilizer.

Calcarious materials (e.g. marble, limestone, volcanic rock) should not be used where the soil pH above 6.5 Acidic rainfall dissolves this material, causing the soil pH to raise and makes micronutrients (e.g. iron,, manganese, zinc, copper) less available to the plant. This may result in deficiency-related diseases.

Toxicity. Toxic substances can be produced when fresh organic mulch is improperly composted. Composted mulch has an earthy odor; avoid using any mulch with a sour or foul odor. Fresh mulch, especially wood chips, becomes covered with hydrophobic fungal spores. The water is repelled and the chips do not wet; therefore, they do not decompose. A few drops of dishsoap or wetting agent will correct this problem.

In 1981 an experiment was begun to study the effects of turf and mulch on 40 newly planted, bare root, 2-2½ inch diameter 'Green Mountain' sugar maples. Mulch trees received a basal layer of two inches of composted leaves topped with two inches of wood chips, mostly fresh, applied on eight-foot diameters. Turf trees had turf to the

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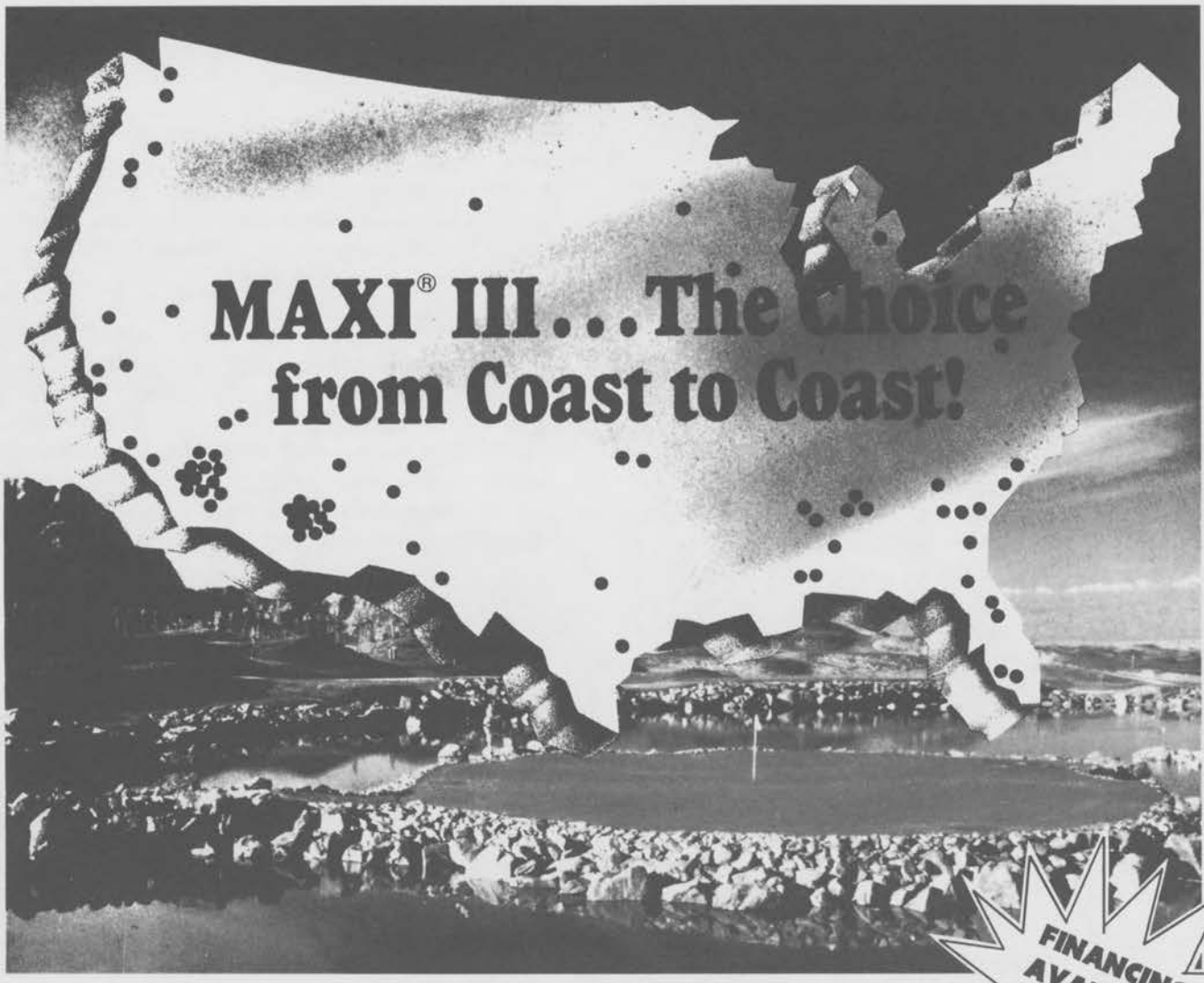

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MULCHING TREES *(Continued from Page 25)*

trunk. The mulch has reduced scorch, increased growth, and color, and increased survival compared to the trees surrounded by turf. Two inches of fresh wood chips are being added every 2-3 years.

MULCHING RECOMMENDATIONS

1. A multitextured (fine, medium, coarse) organic mulch is preferred to inorganic mulches.
2. Apply composted material to the soil and top with coarser and fresher material. Don't incorporate.
3. Do not exceed 4 inches in thickness, and the larger the mulch diameter around a plant the better.
4. Keep mulch at least 6 inches from the trunk.
5. Apply just after hard frost in the fall or after frost in the spring.
6. Avoid applying insecticides within the mulched areas.
7. If living mulches are desired, plant perennial ground covers and avoid disrupting the mulch or root system. Do not use annuals.

LITTLE KNOWN (But Pretty Interesting) FACTS ABOUT GOLF COURSES

Ecologically, the golf course provides some pretty fantastic help to mankind, in addition to just giving him a place to exercise and enjoy life. For example:

An average 18-hole golf course, approximately 150 acres, can produce enough pure oxygen through photosynthesis for at least 100,000 people for the entire year. On a smaller scale, that means a well-maintained lawn 50 by 50 feet liberates enough oxygen to meet the needs of a family of four, day after day.

The same average golf course of 150 acres can effortlessly absorb 12 million gallons of water during a three-inch rainfall.

Grass also provides a cooling effect. A 2000 square foot plot releases as much as 120 gallons of water through a method called evapotranspiration. This release of water reduces the heat factor. Grass absorbs only 50-60 percent of the incoming solar radiation while buildings and pavement absorb 90 percent.

Grass and tree leaves also help cleanse the atmosphere because of their ability to trap dust particles through static electricity of dense foliage. Rain then washes the particles into the soil.

— Hole Notes 9/82

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