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GREEN

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Muddy Water Runs Thick

Design And Build

A Christmas Message

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— 1992 —

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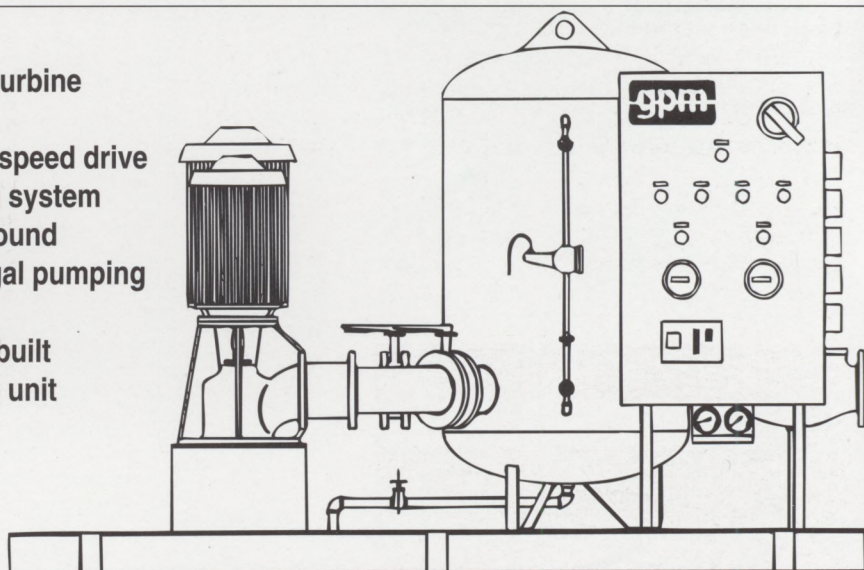


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President's Report

By: Rhod Trainor

In past years I would always look forward to the winter season to unwind and tie up a few loose ends. This year with winter here I don't find myself in the same mood. It doesn't feel like we have had a golf season yet. I can count on one hand, the number of times that I had my sweater off this past summer. I find myself looking forward to next summer already.

I have just returned from Halifax where the CGSA Conference and Trade show was held, we in Ontario could take some lessons from our eastern friends on hospitality. While the conference was not as large as past years, it was most enjoyable. The Lobster Party on the Monday night was without a doubt the best Monday Night Party I have ever attended. The seminars on the Sunday had the best selection and were of the best quality I have seen at the Canadian Show. My congratulations to the CGSA for a successful show.

This coming season will see some changes with the OGSA, mainly in our office operation. At this time we are still not certain about the time or arrangements for moving our office to the GTI building. The building is now complete but not yet fully functional. I can say that it is a very impressive building and that when all is said and done, the OGSA will have an office on the front lines in as high a profile location as we could ever hope for. With our new office in its new location we will be able to provide a better service to our members as well as be more efficient with our communications which include the Newsletter and Roster. We are very much looking forward to this move.

In closing I would like to take this opportunity to wish all of our members a prosperous season for 1993.



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Cover Photo
Freeman Patterson
MASTER FILE TORONTO

Silt Problem Needs Surface Drainage

Mark Leslie

Suspended solids at the root of many mysterious greens failures, USGA official discovers

Poor quality water, containing suspended solids perhaps unnoticeable to the naked eye, is spelling death to golf course greens, new and old, around the country, according to Jim Moore, Mid-Continent Section director for the U.S. Golf Association Green Section. "This is a lot bigger problem than people have realized," Moore said. "It's destroyed a lot of greens, clubs are facing reconstruction of greens and tees built even within the last 10 years because of lousy water quality."

Moore stumbled on this problem during a five-hour ride home one day with a gallon of water from an Oklahoma course sitting next to him. "By the time I got home almost one-eighth inch of silt and organic debris had settled to the bottom of the bag, in a moving car no less," he said.

He featured his discovery in his monthly Mid-Continent News newsletter in August, and in September said, "Already a bunch of guys are testing their water supply."

Moore suggested superintendents buy a very large rain gauge - like two feet high and three or four inches across, making sure it is not tapered. They should then collect enough water from their course's supply or a sprinkler to fill the gauge to the number of inches they apply to the

course per year. If the gauge doesn't hold that much, just deal in fractions, he said. After letting the gauge sit for a week, "be prepared for a shock," Moore said.

One-eighth inch of crud, he said, "is not a pretty sight."

Multiply that amount by the number of years the course has been irrigated, and you can see why so many courses are having troubles, Moore said.

Discovering the magnitude of problem, he said, "is almost too easy."

Moore said the industry will witness more sediment problems in the future as water sources diminish and laws mandate that course builders construct smaller ponds.

If irrigation ponds are smaller, he reasoned, a course will pump it out more quickly than sediment can settle to the bottom. The sediment that doesn't settle ends up on the course.

Meanwhile, he said, builders of old courses paid more attention to surface drainage.

"Today, we have such good subsurface drainage that people think they don't have to consider surface drainage, and that's not true," the USGA official said.

Moore recommended superintendents

immediately check their water.

"This is like taking your temperature," he said. "If it's high, then do something about it."

"This is a lot bigger problem than people have realized. It's destroyed a lot of greens. Clubs are facing reconstruction of greens and tees built even within the last 10 years because of lousy water quality." - Jim Moore USGA Regional Director

Saying superintendents should "stop the problem before it reaches the pumps," he suggested several remedies:

- Install a filtering system. "In most cases that's all you need."

- Clean the intake system. "Some people haven't done this in years."

- Lift the intake off the bottom of the pond.

- Hire a specialist to install a fence around the intake and line it with a special fabric to serve as a filter.

- Have the irrigation source dredged. This rids the course of silt and adds depth to the water storage.

"I wish superintendents would have a soil lab test their water and repeat the test every year to see if the values (the percentage of silt and clay) are changing," Moore said.

The grass of '92

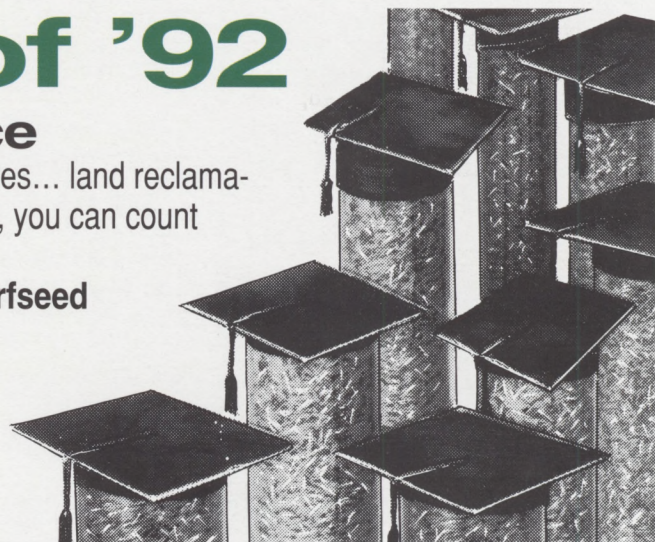
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The Old Way Might Be The Best Way

By Lisa Maki

Before the 20th century, few men practiced golf course architecture. St. Andrews, Prestwick, and Carnoustie are relics of the natural links. Mother Nature was their creator with little assistance from a designer or a builder.

Astounding growth in the game, diminishing ideal terrain, and major technological advances led to the first generation of "golf course architects," practitioners trained in disciplines associated with golf course design, beyond just playing the game. It was a time when brilliant men "designed and built" renowned tributes to golf on both sea-side and parkland sites. Golf flourished.

Then came a time when opportunistic developers and lenders appeared. They preyed upon the game's dramatic settings to attract resort guests and real-estate buyers. Funds were liberally dispersed, and monuments were built.

Architects began to realize they were compromising their futures by designing these monuments with vast waste bunkers, radical hazards, geometric features, forced carries and treacherous greens.

Many architects returned to their roots, to design more traditional courses. This resurgence has caused many golf course architects to diminish the distance between office and site, to interact directly with the land as the pioneers of their profession did, to practice Design-Build.

Robert Trent Jones, dean of modern architecture, practices as his forefathers did. He believes it is necessary to control not only the design, but also the building of a project. Thus, the family owns and operates "Design-Build" companies, Robert Sr. once made the following state-

ment in reference to his Design-Build company, "You have to do that [design and build] or you don't come up with what you are after."

His son Rees concurred, stating that "the hardest part [in designing a golf course] is transferring the idea from the architect to the builder and having it come to the satisfaction of everyone."

Pete Dye is another practitioner of the "Design-Build" approach. He refers to himself as a job foreman, overseeing both design and construction. He is a creator of golf courses, cut straight from the hip-boots-in-the-muck mold, often routing and rerouting courses in the field. Dye believes he "develops the best possible course, faster, for less money using the Design-Build approach."

As Rees Jones and Dye affirmed, no matter how talented a golf course architect is, it is impossible to create a flawless three-dimensional design when working in a two-dimensional medium of pen and paper, or even digitizer and monitor. Inevitably, alterations to the design must be made on site in response to actual conditions. A Design-Build company can implement these changes quickly and economically, virtually eliminating the dreaded Change Order, as this approach allows for flexibility within a fixed budget.

What other benefits are there for the Design-Build client?

- There is single contract for a fixed price.
- Solid budgets enable job costs to be determined from start to finish.
- There is efficiency in dealing with one firm (no overlap of budgets or schedules and changes can be implemented faster).
- Clients' needs are transmitted to one person responsible for the project.
- Communications are good, therefore

the need for final drawings is reduced.

- Information is shared about project intentions, needs, materials and labor costs.
- The efficiencies gained in the process allow the client to become a major player in the design process, and to have more control over the entire process.
- The designer and the builder have cross-purpose goals (not just designer-beautiful and contractor-profitable). The credibility of each side enhances the other. Their entire reputation is invested in the job from creation through construction.

The Design-Build legacy has been preserved by a number of the esteemed architects. They are not typical golf course designers, in the fixed role of professionals who produce designs and supervise their execution.

Instead, they own and operate businesses that provide both design and construction services. They are not considered unprofessional, or undesirable, or suspected of adjusting their rates of service and costs of materials.

Unfortunately, Design-Build is not the norm in the profession. Designers practicing it are often looked upon as black sheep. Why shouldn't the more budget-conscious developer have access to the same scope of services as the affluent developer? Today's tight markets necessitate cost-effective alternatives. Perhaps, developers should consider a historic approach to designing and building courses, as a novel solution to providing an on-time, on-budget, quality product.

Lisa Maki is president of Golf Design Services of Round Hill, Va. She was a golf course designer/project manager with Links Design, Inc. of Lakeland, Fla., from 1984-1989.



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Muddy Water Brings Trouble

By Mark Leslie

A river rechanneled 30 years before was a source of clay build-up at Brook Hollow GC.

Little did members of Brook Hollow Golf Club know in the late 1950's that when the city of Dallas rechanneled Trinity River, it would cost them more than \$2.5 million in course reconstruction 30 years later.

But that is the case, says Director of Grounds Bill Shrum.

When Shrum arrived at Brook Hollow from Denver Country Club in 1989, he found 2-1/2 inches of silt clay at the surface of his greens - only five years after all the greens had been rebuilt. That paled to the three to nine inches he found on the fairways of the A.W. Tillinghast-designed track.

And all this on a piece of property rare in the Dallas area. It is blessed with sandy soil.

Yet that sandy soil is now far below a layer of silt clay that spells death to turf.

"The problems were evident the second month I was here," Shrum said.

"Nothing was right. The rooting wasn't proper. I did two years worth of test and research and looked underground. I used several labs and brought in Jim Moore [U.S. Golf Association Green Sections Mid-Continent director], [Drs.] Joe Duich and Milt Engelke and others, who all confirmed my findings."

The culprit, all agreed, was the water source. When the city rechanneled the river in the late 1950's the section of the river at the course was turned into a drainage sump.

The situation worsened further when clay from nearby freeway construction in the late 1950's went into the riverbed. Consequently, future waterings contained undesirable large quantities of silt and clay to the point of sealing the original sandy surfaces.

After two years selling the idea of renovations to Brook Hollow Golf Club committees and one year selling it to the membership, Shrum is looking forward to having a healthy course.

Course reconstruction, from tee to green, was scheduled to begin Nov. 2.

With the reconstruction, which will shut the course down for 10 months, he is connecting the facility to a new five-acre lake contractors built as the clean water source.

A new pump station was equipped with both a floating intake and particle filters for additional protection.

The club had brought in architects Bill Moore and Ben Crenshaw and contractor Ed Connor of Golfforms. Coore and Crenshaw will design the shape of bunkers and greens, while Connor will strip the sod, contour the fairways, and laser-shoot the greens and tees.

Connor will strip off the top inches, chisel plow 12 inches deep, and regrade for positive drainage physics. The club will then have a new irrigation system installed.

"We'll get the course working for us," Shrum said.

"Here's a guy," said the USGA's Moore, "whose alertness has saved his club's course and a lot more money."

Times have changed.

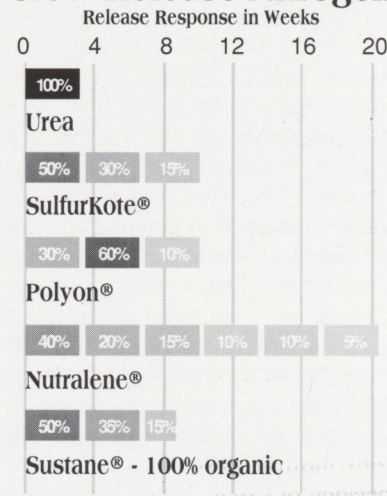
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Merry Christmas

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Best Wishes For The New Year

To

All Our Members



Christmas

By Olya Katherine Harding

Peace, Unity, Strength ... and Love

Among a thousand other things, Christmas reminds us that we all believe in God. Oh, we may claim atheism, agnosticism or other "isms", but we are then believing in not believing - so it seems that even then, we still believe. It is belief itself which is the key.

For aeons, belief has formed our strength and our purpose. The expression and materialisation on earth of what we know to be above originated in belief. "As above, so below" may be a trendy expression these days, as it challenges us to human achievement in its many forms from dieting to corporate climbing, but it may have originated with the Ancient Greeks and their pantheon of gods.

Metaphysically, it means that what is in your head (above) you will experience in your body (below). In physics, it means that what is contained in the macrocosm, the universe, is duplicated in the microcosm, us. We know through science that matter, that which we are made of and that which the planet we share every day is made of, has a direct and equivalent existence in anti-matter. "Beam me up, Scottie" is real - it's just going to take some more time. Technology is rushing us headlong into unknown interpretations of the human potential maxim that whatever the mind of man can conceive, it can achieve.

In spiritual, or religious terms, we and our mother earth are but material expressions of Creation and our Creators. It is God happening every day on earth. This is true whether we claim to believe in God or not.

In other words, what is at the top manifests its own image at the bottom. It's much like having a child. Don't our babies look like us, and pass on our ancestral strengths and weaknesses? The joys of being human include creation and procreation. Our joy at receiving a new little one of our own blood is but a minute reflection of the joy felt at the First Christ Mass when God appeared in the flesh.

No less than a baby is the gift of its parents to the earth and her family of nations, was Jesus God's gift to us all. Each Christmas, we pause to reflect on the importance of that gift, often when we select a special gift for one whom we cherish.

Most of us will become even more introspective. We move beyond the trite commercialisation of Christmas in our retrospectives. Usually, we start by complaining about that very over-commercialisation. Then we call old friends, or think about those we don't call or have lost touch with; we travel great distances in inclement weather to go home; we remember those who feel sorrow instead of joy, for want of friends to call, family to visit, or homes to celebrate; we smile a lot; we donate to charities; we sing carols.

1992, more than any year recently passed, requires deep retrospectives, sharing and unity. Crises are suddenly becoming unmanageable; the pace of



changes taking place in our world is accelerating so fast, we lose sight of the problems. Overspecialisation leaves us uninformed about the people and events that are shaping our tomorrow, and the futures of our babies.

How then, can there be only solutions, not problems, to paraphrase the parlance of sales hype gurus? What are the questions? Where can we look for answers?

Each Christmas, year after year, we all ask: "Why can't it be Christmas (without the presents, of course) all year round? Why are we nice to each other only at Christmas time?" Where have we taken a wrong turn?

Each and every one of us will have our own answers on a personal, individual level. Many, if not most, of us are already tackling these agonising personal growth issues. Too many of us are in recovery from the effects of one sort of abuse or another. Some of us make it; some don't.

This Christmas, remember to

believe in an "A" for effort, however successful or unsuccessful the candidate. Trying, we were taught as children, is what counts. That is still true.

Childhood recaptured and frozen in time. Most of us froze those moments with the help of Kodak. Many of us pull out those old family albums and relive Christmases gone by: Where did we live? Who were our friends? When did Santa eat all those cookies we left him? What time will he come? Can we stay up and wait for him? Then we recall our own children asking us those same questions.

For too many of us, childhood was, and is, a nightmare; Christmas just doesn't happen. This simple, heart-breaking fact is one we usually sidestep. We don't want to feel pain at Christmas. Small wonder. But what of those who do? Will they one day have the chance to collect photo albums of their own?

Year in and year out, Christmas gives us a release - we overextend our bank balances and rack up credit card balances that we can't even begin to pay off until August, because we're paying off our tax debt until then. We're in denial about the economy every Christmas, too. Amnesia sets in and we forget what Free Trade has done to Canada, and we direct our hope for tomorrow to the guys who stuck it to us yesterday.

Most of us don't know how close we are to closing down Canada, lock, stock, and barrel, and we sure don't want to think about it at Christmas time! But if we don't think about it at the time of universal Christ Mass, when will we start? Maybe New Year's Day, with a new spate of resolutions that may last two or three days? How long after visiting the confessional do we commit that same old sin again? Usually, it's not long at all.

It is precisely these questions that we should be thinking about every Christmas, and every day, if we are Christians. Christ did. He taught that we should too. He himself was very much concerned with both church and state. Christ was, after all, a king - the direct descendant of the House of David. He cared that Rome and Empire oppressed His people, and all people.

He was as political as He was spiritual. He cared about human rights, law, and God, and the respect for them all.

He was an ascetic, yes - but He acted on His beliefs, and He taught us to act on ours.

Christ left us a world that was not yet so diseased that it could not sustain life organically. Ecological battles were as yet unheard of. But they are not so different in essence from the battles against Empire that He fought, with their dearth of spirit, corruption of power and privilege, and loss of human dignity and life.

Christ taught us that church and state may be separate in form, as indeed organisations with specific mandates to accomplish must be, but there is an underlying unity. Christ did not teach that the spirit of God should be left out of either, or both, but that in Him we find All.

In fact, we learn from the brilliant scholarship of the Dead Sea Scrolls that Christ taught us that Church and State are united in a single being - Himself. This means that, according to Christ, we can be both political and spiritual directly and individually. In Him, church and state met and were united for the first time. From Him, the New Way emanated.

His way included all people everywhere. No exclusions. As brothers and sisters in Christ and of Christ, we can rejoice this Christmas knowing that He is of us and we are of Him; just as He was of God and of Man. As brothers and sisters of Christ, logically and in faith, we also carry the essence of God. As He said, we are God's children. God made us. In His

image. Each and every one of us - to celebrate His own existence. To make an idea into substance.

Our genes, therefore, carry the idea and essence of God. First, His energy transformed into Light. Then positive and negative collided in space to form matter. Out of that Genesis (Material God or Mother Earth) came humankind. Yet another manifestation of God - a vehicle for God; a means for energy (anti-matter) to experience Self in substance eternally. God's self-creation would perpetuate to the end of time because of procreation.

An idea, a thought, a hope, belief, concept, whatever we want to call it, was made real. God gave "Himself" form.

At a time of profound historical change, danger, and pain, Christ arrived with a message: the king and the priest are one, and are united in me. Compassion as well as order and defence. His message was believed, and has carried on, in one way or another, for 2000 years.

As we approach the year 2000, with the hi-tech revolution uncontrollably propelling us into the orbit of the New World Order (as opposed to the New Age or New Way) and the entrenchment of economic, political, and spiritual heresies, we must take time this Christ Mass to plan for tomorrow. What did God want on the First Christ Mass? What does God want now? What do we, God's children, want?

Birth, the creation of life, whether human or otherwise, gives us a focus and direction as we begin our search. Look at a baby. Look at your heart. Though we may find that our search will take us far afield, we'll have our answers when our hearts explode with love. That's the beginning.

There's a long road ahead. Feeling, like God's energy, must be made manifest in actions and attitudes. This path is difficult; but it leads back to God. Christmas is a good time to shore up our collective strength.

As we prepare to sit down to Christmas dinner with our families, whomever they may be, this Christmas Day, let us all, as a family of humankind, join hands together in a powerful prayer to send a message from below to our Creators above. Let us tell our God, whatever name we call Him or Her, that we still care, that we still have hope, and love. That we will act accordingly. Let's believe again.

May our collective New Year's Resolution truly be a proactive Peace on Earth and Goodwill Toward All. Let's open our minds, and open our hearts. We must move beyond listening into hearing. Hear each other. Then do something. No matter how small or large. Do it. Care.

May this Christmas Day be like the First, for it is truly the first day of the rest of our lives.



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Hurricane Andrew

At the fall meeting in Ottawa, a decision was made to contribute \$500.00 to the Hurricane Andrew Relief Fund.

IN MEMORIAM

*Vincent Piccolo,
long time member, passed away
November 21, 1992
O.G.S.A.
extends sympathy to family and friends.*

It is with great sadness that the entire membership of the Florida Golf Course Superintendents Association has responded to the needs of the members who suffered a great loss due to Hurricane Andrew.

This individual was at a very low point, both financially and emotionally, and when he received the check from F.G.C.S.A. there was a complete turnaround in both areas.

He is far from being fully recovered, but due to your efforts he is well on his way and headed in the right direction.

Thank you again for a tremendous gesture.

Sincerely,
Willie Houchins

Ohio State

The seventh annual OSU Golf Course Maintenance Short Course will be conducted January 11-15, at the Holiday Inn on the Lane in Columbus, Ohio. This short course will provide current valuable information on golf-turfgrass maintenance. Emphasis will be placed on principles of agronomy, soils, entomology, plant pathology, and applicator safety. The short course is designed for all golf course

personnel including golf course employees, foremen, and superintendents seeking a more formalized training in golf-turfgrass maintenance. Attendees will qualify for recertification credits from the Ohio Department of Agriculture for Licensed Pesticide Applicators. Certified Golf Course Superintendents (CGCS) will qualify for continuing education units from the GCSAA.

The registration fee is \$350.00. The deadline to register is December 21, 1992, or until 60 applications are received. Lodging facilities are available at the Holiday Inn on the Lane, or other local hotels.

For more information, please contact Barbara Bloetscher at (614) 292-7457 for short course content, or the Department of Conferences and Institutes at (614) 292-4230 for course registration.

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From the Editor

Simon George

This is our Christmas issue, the fourth and final issue for 1992, another year is just around the corner.

Over the holiday season, I hope we can all realize that in a world overrun with problems and suffering most of us should feel very fortunate.

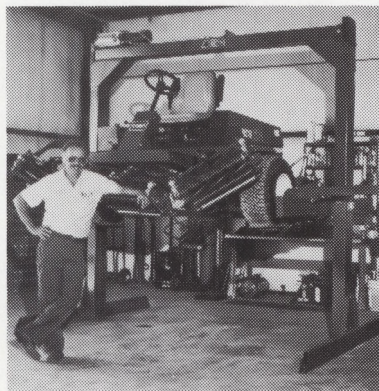
To be involved with an industry as strong and healthy as ours is, to have strong associations where lifelong friendships exist, to work in a very pleasant environment, these are all gifts to be thankful for. Too often these gifts can and do get taken for granted.

The O.G.S.A. has continued to grow and to share some of our success -please read on.

This Christmas issue marks the last issue for me as editor, next year the job will be done by Doug Suter. I have enjoyed my term as Editor and look back and feel very satisfied with the growth of our magazine.

In closing, All The Very Best Of Christmas to You All and Best Wishes for the New Year!

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Golf Course Preserved

David W. Gourlay

CGCS, Director of Golf Course Operations, Eagle Creek Golf Courses

A statement given by Dr. Meg Sears of the Wetlands Preservation Group at the September 21, Ottawa court hearing, revealed the process against the Eagle Creek Golf Course in Dunrobin has cost the taxpayers "hundreds of thousands of dollars." An Ottawa court has ruled that Eagle Creek is within its rights to operate and maintain the facility as a world class championship golf course.

The group was formed in opposition to the construction of the golf course since 1989 and has since taken the developer and golf course to the Ontario Municipal Board and Environmental Assessment hearing to state their case. In both instances the court viewed the golf course as a permitted and safe use according to the current zoning bylaws. The September trial, privately laid charges by Dr. Sears, produced the same not guilty verdict as the previous two charges. It is an outrage that the local taxpayers have had to pay the associated costs of these unnecessary hearings as a result of the misinformed public perception of golf courses.

Unfortunately the general public, most of who are not engaged in the field of agriculture, have a

very inadequate understanding of pesticides. Much of the public perception is generated by the media either through television, radio or in print. We must realise that a certain degree of sensationalism is commonly exercised to make a story more interesting and arousing. This is the nature of the media business. Therefore the public is bombarded with environmental issues pertaining to the perception of widespread hazards associated with presumed long term accumulations of pesticides in people, other organisms or in the environment. The result of this intense misinformed exposure to pesticide use is clearly documented in a U.S. study conducted in 1987. These groups of people were polled which included college students, League of Women Voters and business people, concerning the actual risk of accidental death for various causes. Thirty causes were listed including such items as motor vehicle accidents, swimming, skiing, home appliances and pesticides deaths. Astonishingly, the college students group ranked pesticides as the fourth leading cause of accidental death.

The fact is that pesticides ranked number twenty eight far behind

the number of accidental deaths of swimming, bicycles, home appliances, commercial aviation, bee stings and skiing. Of the accidental deaths by pesticides the data pinpoints the major causes as child poisoning. It appears that home owners are storing pesticides including moth balls, insecticides, herbicides and rodenticides in child accessible places around the home.

Is it any wonder that concerned citizens band together to protest, petition and object to the officers of the planning authorities when a golf course is concerned. The Eagle Creek Golf Course has come under the same misinformed perceptions regarding the suitability of a golf course in an environmentally sensitive wetland area. The OMB ruling in 1991 required the continued monitoring of the adjacent Constance Creek stream of all pesticides and fertilizer usage in conjunction with the operation of the golf course. Although the data is still preliminary in nature certain observations can be made pertaining to the impact the golf course is having with Constance Creek. As with the U.S. study conducted in Cape Cod, Massachusetts in 1989, pesticides have not influenced the quality

of the ground water or adjacent waterway. In fact, the golf course is acting as a filtration plant by filtering out contaminants from Constance Creek by way of the water being pumped through the irrigation system and being filtered by the turfgrass organic matter, and sandy profile. By utilising an integrated pest management programme the application of pesticides has been an insignificant treatment factor in the control of pests.

In addition to the purifying factor the golf course is providing to Constance Creek, the property is providing wildlife with a sanctuary. As no hunting or trapping is permitted on the golf course the native wildlife including deer, fox, beavers, porcupines, blue herons, birds and other small animals are able to live in a protected and safe environment.

Unfortunately, these misinformed perceptions that golf courses are not a compatible land use in our environment is not limited to just the Ottawa area but across Canada and the United States. If these so called protectors of the environment were given a choice of a dump site or a golf course as a land choice, I would be hesitant to speculate their preferences.

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Ammonium Sulfate fights summer patch

A new study shows that ammonium sulphate fertilizer (21-0-0-24S) suppresses summer patch, a fungal disease attacking the roots of grasses, according to Dr. Joseph Heckman of Rutgers University.

Heckman said the intensity of this turf disease increases during hot, humid summers. Summer patch affects Kentucky bluegrass, annual bluegrass and fine fescues.

Heckman has been working with Rutgers plant pathologists David Thompson and Bruce Clarke. "Ammonium sulphate reduces soil pH almost immediately and that has been shown to suppress summer patch in our test on Kentucky bluegrass," Thompson said.

"Urea lowers the pH in the short term it actually increases it and urea does not suppress summer patch. Neither calcium nitrate nor ammonium sulphate offer the pH lowering effect," Thompson said.

Tests in 1991 showed a 50% reduction in summer patch when ammonium sulphate was applied compared to urea. Thompson also said that urea caused a delay of the development of summer patch.



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Minimize Employee Pesticide Risk

Tim Doppel

A Patch of Green, August 1992

2, 4-D OR NOT 2, 4-D Training Makes The Difference

In the 1990s we have heard a lot about pesticide exposure and how to minimize the risk to employees and others who may come in contact with the pesticides. A recent study at the University of Guelph in Ontario, Canada, looked at the entire spectrum of exposure to pesticides and reported some very interesting results. In a nutshell, everything we have always believed as true was verified, but let's look a little closer at some of the information we now have.

The study looked at 2, 4-D exposure by professional applicators. The total exposure was measured, that is, how much 2, 4-D these people handled and then how much 2, 4-D was excreted from their bodies over a period of time. Since 2, 4-D and other phenoxy herbicides are such a hot topic with so many people today, this presents some good information with which you should become familiar.

The results found no correlation between how much 2, 4-D was handled and how much was excreted. In fact, the person who was the loader/mixer at the firm actually had a lower excrement level than some of the applicators. The applicators themselves had all different levels of excrements when they were exposed to virtually the same amount of 2, 4-D.

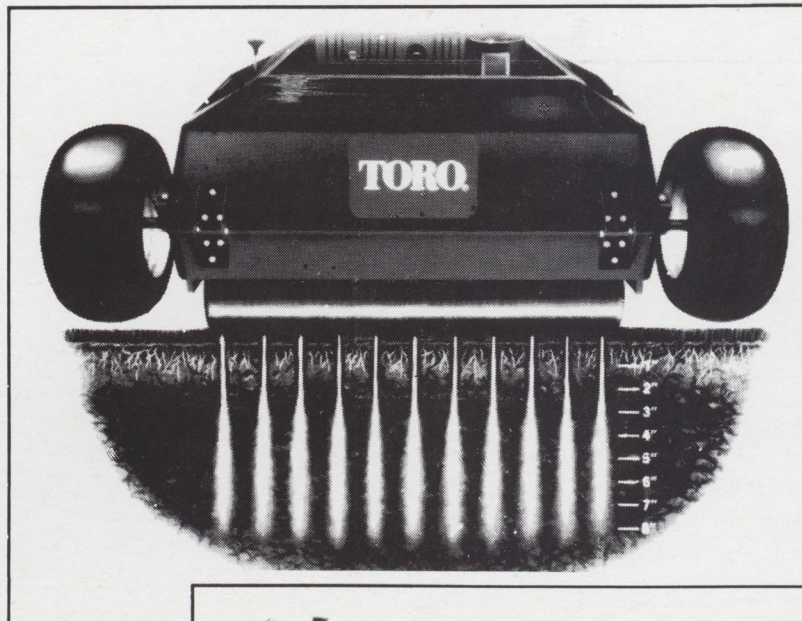
So what makes the difference? Very simply, it came down to the care taken by the person handling the pesticide. The mixer/loader understood, apparently, that he was handling a more concentrated material and therefore was more cautious. The applicators had varying levels of exposure. Rolling up hoses with bare hands, not using boots or long pants, all increased the amount of 2, 4-D excreted by the applicator. This information backs up a study done at Michigan State University several years ago that showed proper uniforms decrease overall exposure dramatically.

Another aspect of this study looked at exposure to persons who walked on the sprayed turf or who were bystanders to the application. Certainly, these are concerns for everyone who applies pesticides on golf courses. The bystanders had no measurable exposure for 96 hours after the application; and of the persons who walked on the turf, the only ones who had a measurable response were those in bare feet and shorts who sat on the turf within an hour of the application. Even so, the excrement was below any World Health Association acceptable daily intake levels. The good news here is that if people are wearing shoes (and most of our players do!) then their potential exposure is exceedingly low, if not nil.

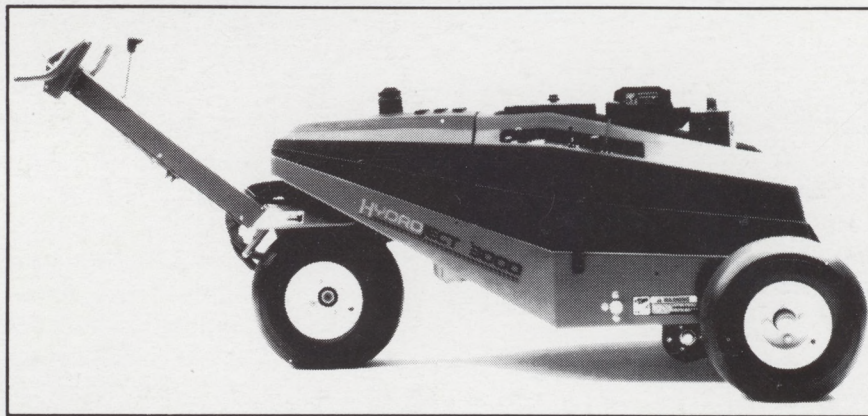
The bottom line from this study is that proper training does make a difference. Any time spent teaching our applicators and other employees about the proper use of pesticides and waiting until the applications dry before coming in contact with the turfgrass, will pay big dividends in employee health and safety.

One word of warning. Don't assume that your long-term employees don't need the reminders! The MSU study indicated that it was the more experienced applicators who were a bit more careless and had higher levels of exposure. All employees need constant encouragement to work safely and to use the proper safety equipment. As the superintendent, it is your job to be sure they follow directions.

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