

ns From MTI

The Complete Source for Irrigation Needs

E•SERIES S A T E L L I T E

- **E**nhanced
- **E**asy
- **E**conomical
- **E**xpandable

Many new features

PRISM

- **P**alm-PC
- **R**emote
- **I**rrigation
- **S**ystem
- **M**anager

Hand-held control

Ask about our

IRRIGATION SYSTEM FINANCING

Contact Your MTI Sales Team Today

MTI DISTRIBUTING, INC.

TORO

14900 21st Avenue North • Plymouth, MN 55447
763-475-2200 • 800-362-3665

4310 Main Avenue • Fargo, ND 58103
701-281-0775 • 800-782-1031

EQUIPMENT SERVICE

- Trouble Shooting
- Cutting Unit Rebuilding/Sharpening
- Electrical Diagnostics and Repair
- Hydraulic Diagnostics and Repair
- Engines – Motor Repair/Rebuilding
- Field Service

PLYMOUTH

Randy Mackeben, Ext. 229

FARGO

George Vogt

IRRIGATION SERVICE

- Pump Station
- Trouble Shooting
- Refurbishing/Updating
- Solid State
- Electro/Mechanical
- Field Service

Call John Artus, Ext. 205

EMERGENCY AFTER HOURS IRRIGATION SERVICE

Call 763-475-2200, Ext. 167 or 1-800-362-3665, Ext. 167

(For service during regular business hours 8:00 am – 4:30 pm, Monday – Friday, call John Artus at the above numbers, but use ext. 205)

EARNING YOUR RESPECT



Advanced Products Reliable Service

Golf course irrigation is a new game of sophisticated products and advanced technologies. At Century Rain Aid, we are proud to represent Hunter Golf, the leader in innovative control systems and manufacturer of the world's best-selling rotors. Century Golf professionals can show you how Hunter's complete line of irrigation products, including new Vista software with automated programming and real-world visual control, can help save water, labor and energy costs.



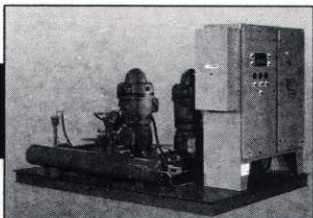
Our golf team can also assist with a wide range of services essential to golf courses: controller board repairs (toll free: 888-855-9132), fountains, pumps, landscape lighting and more. Call today for a free Century Golf Course Supplies Catalog or on-site consultation: **800-642-3706**.

CENTURY RAIN AID

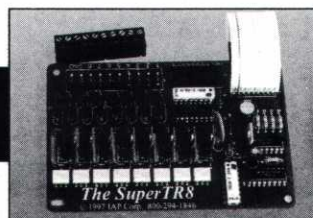
More Than 125 Branches Coast to Coast
www.rainaid.com • email: rainaid@rainaid.com



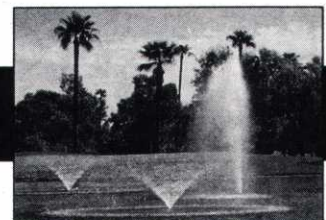
SyncroFlo, Inc.
SYNCROFLO EAGLE PUMPS



BoardTronics Inc.
CONTROLLER BOARD REPAIRS



AQUA MASTER FOUNTAINS



Protecting Your Irrigation System From Lightning

Lightning is one of the most powerful and unpredictable forces of nature. On average, lightning damages between 90 and 120 golf-course irrigation systems annually. Lightning-detection equipment helps prevent your equipment from becoming a part of this statistic.

By Dana Blakeslee, Rain Bird Sales Inc.

Any number of golf-course superintendents can attest that disaster strikes in the blink of an eye or, more specifically, in a flash of lightning. An age-old enemy of nearly every aspect of golf, lightning sends shivers down the spine of every superintendent. Nowhere is this more apparent than with irrigation systems.

Irrigation systems help maintain the quality of turf and therefore the quality of play on golf courses across the country. Highly advanced irrigation systems are at the heart of the most attractive courses. While these systems incorporate new technology and enable centralized overall irrigation control, the ever-present threat of lightning damage becomes not only an economic issue, but also a competitive one.

Acting as an antenna or network, on which surges of electricity travel with little resistance, an irrigation system's wiring—not unlike office or home-equipment wiring—is susceptible to lightning-based surges. The costly repairs and loss of productivity associated with surge damage to an office's computer network also applies to golf courses when lightning strikes. In addition to repairs to the management system, satellite controllers or the pump station, surge damage affects turf quality by interrupting finely tuned watering schedules. Though it is unusual for lightning to knock out an entire system, even small repairs are a setback for courses competing to attract a finite number of players. For this reason, several lightning countermeasures are available to protect your irrigation systems and your course's competitive edge.

Voltage-Limiting Devices

Voltage-limiting devices, commonly known as "surge suppressors" or "lightning arrestors," are the most widely used lightning-protection mechanisms. Integrated into the equipment wiring, these devices channel dangerous surges away from exposed electronic components to an earth ground where they harmlessly dissipate.

Present in the majority of sensitive electronic equipment to protect against all types of surges, these devices appear as an "open" circuit—until a surge enters the wire. This open circuit changes to a conducting path and diverts the surge to an external ground when it (the surge) exceeds a pre-

terminated voltage level. Proper grounding is the most important aspect of voltage limitation. You must test the ground on a regular basis to see if it is functioning properly and offering proper protection.

Two types of limiting devices—metal-oxide varistors (MOVs) and spark-gap arrestors—comprise many conventional lightning-protection systems. Combined, these devices address the speed at which lightning surges reach their peak current on the wire as well as the magnitude of large lightning strikes.

Research shows that lightning surges reach their peak current within the first few milliseconds of a strike. Therefore, lightning's most destructive period often occurs before limiting devices can react. MOVs, however, react quickly to clamp the initial energy spike when it exceeds a safe level and shunt the excessive energy away from vulnerable circuit components.

When particularly intense lightning (30 million volts or more) strikes, the surge of current onto your system wiring is too much for a MOV to handle. In this situation, spark-gap arrestors, though slower to react to lightning surges, respond to the massive energy surge. Large current surges break down an inert gas in the spark-gap arrestor's tube, channeling excess current flow toward the ground rather than the electronic components.

Shortcomings

Varistors and spark-gap arrestors, used in tandem with a good grounding system, provide remarkable protection from fast-moving energy spikes and massive energy surges once they enter the system wiring. However, these countermeasures have several shortcomings. The case against their conventional protection includes the following complaints:

- * They don't offer any protection until a voltage surge is literally in the wiring connected to your equipment.

- * They have a finite life span. They will work for a specific number and level of surges, then their effectiveness diminishes or they cease to function.

- * They provide lightning (in certain situations) an electrical path to enter and damage equipment.

(Continued on Page 24)

Lightning--

(Continued from Page 23)

According to Dan Young, president of Rabun Labs Inc. (Plant City, Fla.), conventional protection devices can pass a dangerous voltage surge, known as "low-side" surge, from the grounding wire into electronic components. This surge comes from lightning striking the earth near the area used to ground an electrical system. The energy from the lightning dissipates into the earth and becomes electrically connected to equipment, depending on how well the ground is connected. At this point, the surge runs back toward the protection device and passes into the equipment.

Isolation

Ironically, the system that protects against the widest range of lightning-related problems is perhaps the most obvious one-isolation. Unplugging a piece of equipment is a sure way to avoid lightning damage.

While disconnecting a piece of equipment from outside seems simple enough, almost anyone will agree that unplugging every piece of equipment each time there is a threat of lightning is unrealistic. Moreover, even if it were realistic, irrigation systems are far too complex to simply unplug. Today's modern systems feature active-disconnect technology that takes the place of manual disconnection.

MOMENTUM™

The Next Generation of Broadleaf Weed Control

A Premium Selective Herbicide Exclusively from
LESCO



- New, improved chemistry formulation combines TIPA 2,4-D, triclopyr and clopyralid acid for highly effective control with virtually no odor
- Fast acting - dandelions and clover curl within hours of application
- Better and broader spectrum weed control than most other popular broadleaf herbicides

Ask your sales representative about this great new product exclusively from LESCO, or call 800-321-5325

LESCO®

LESCO is a registered trademark and Momentum is a trademark of LESCO, Inc.

Active Protection

Compared to the "passive" protection of conventional surge-limiting devices that react once lightning is actually on the system wire, "active" protection responds to the threat of lightning. Active technology literally isolates the irrigation system from outside power before the lightning surge enters the wiring system. Divided into three separate units, protect the main areas of an irrigation system (management-control system, satellite controllers and pump-station equipment), these units disconnect each area during the threat of lightning. Each unit reacts to a lightning threat by automatically disconnecting and isolating the AC power, field wiring or weather-station and telephone lines. Additionally, when a storm subsides and the threat diminishes, the system automatically restores all power connections to the equipment and proper function resumes.

Generally located in a building (such as your office building), the system-control box communicates via a remote detection unit (RDU) that senses lightning's radio energy and connection relays. It then physically disconnects the equipment when it detects a lightning threat.

Sensing radio energy (distinct from man-made frequencies) as far away as two miles, the RDU's remote distance of 500 feet allows for convenient location in areas free of interference from power lines or debris. To protect your equipment, you place disconnect relays in series with the power lines leading to your management-control system, satellite controllers and pump station.

Tri-Disconnect

Tri-disconnection begins by alerting the control system and disconnecting each unit if the radio energy received by the remote unit matches the lightning profile. In other words, switching circuits at each relay connection immediately disconnects the equipment from AC power.

Complete isolation for satellite controllers, however, includes the two-wire path still connected to the satellites. The satellite-controller unit isolates the field wiring when it senses that the AC input to the satellite disconnects at the source or when a storm causes the loss of commercial power. This option disengages the inputs of each satellite and outputs from all outside power sources until the storm moves safely away.

You accomplish pump-station protection in much the same way as you do the irrigation-management-control system and field-satellite controllers-by electrically isolating the pump motor and controllers. However, when the system detects lightning, it signals the pump controller to shut down the pumps, and it leaves the satellites on for approximately 30 seconds to relieve pressure before they are disconnected.

Shunting, Grounding and Reconnecting

A common concern with any isolation technology is the possibility of lightning "jumping" the switching contacts that perform the various disconnect functions. To protect

(Continued on Page 25)

Lightning--

(Continued from Page 24)

against the possibility of surges jumping onto the wiring, active-protection technology also utilizes shunting action and grounding to ensure that a surge of energy on the wiring diverts away from the equipment. By shunting and grounding these inputs away from the system's equipment, surges cannot jump the disconnection.

To understand "shunting," imagine an AC power plug that has all three prongs-hot, neutral, ground-connected together. When a dangerous surge moves onto a shunted wire, with all three legs at the same ground potential, it follows the ground because electrical energy always follows the path of least resistance. Again, the ultimate success of this technology relies on proper grounding function. You must check grounds on a regular basis to ensure proper function.

The disconnect-cycle timer on the system remains in the disconnect mode for a minimum of six minutes after the last detected lightning strike. By staying disconnected for this amount of time, the system not only isolates equipment from AC power surges but also prevents short circuiting in motors and powering-up of equipment when the possibili-

ty of a lightning strike still exists. When the threat of damage passes, the system automatically reconnects the relay points, reintroduces AC power and normal operations resume.

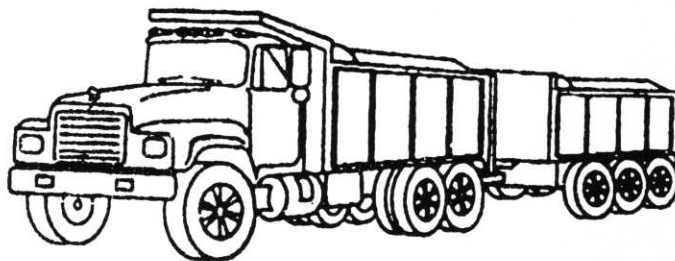
The Bottom Line

Various factors play a role in decisions concerning lightning countermeasures. However, the rationale for your decisions remains the same-preservation of your irrigation system. Budget, location, experience and personal preference cause every decision-maker to rely on the type of lightning protection with which he or she feels most comfortable.

Despite advances in lightning protection, there is no complete defense against lightning damage. A direct hit from a bolt of lightning makes every protection system look the same-inadequate. The use of new and existing technology to reduce lightning damage is a measured investment by anyone's standard. However, few superintendents with a (lightning-induced) useless central-management computer or a melted circuit box take this standard lightly.

* * *

(Editor's Note: Dana Blakeslee is the golf satellite brand manager for Rain Bird Sales Inc.)



LEITNER COMPANY

Specializing in Soils for Golf Course Maintenance & Construction

Soil mixing and processing specialists.

Supplying the Golf Course Industry with soil and sand products for over 50 year.
From 10 yards to 10,000 yards — material to specification for topdressing and construction.

Quality — Reliability — Experience

MIKE LEITNER

LEITNER COMPANY

945 Randolph Avenue • St. Paul, Minnesota 55102

(651) 291-2655

PROUD SUPPORTER OF RESEARCH AND EDUCATION THROUGH THE MGCSA

Dealin' Dan's Havin' a Sale!!

Why wait until Fall to get a bargain on new, used or demo equipment. You are cordially invited to join us for our first annual North Star Turf outdoor equipment sale. Mark your calendar right now so you don't miss it!



3080 Centerville Road
St. Paul, Minnesota 55117
651.484.8411 • Fax: 651.484.8257
800.592.9513

- When:** June 23, Noon to 6:00 p.m.
June 24, 7:00 a.m. to Noon
- Where:** North Star Turf, Inc.
3080 Centerville Rd.
Little Canada, MN
(Next to Slumberland. Call if you need directions.)
- Who:** You, your neighbor, friends, relatives, members of your bowling team. . . .

You'll find the year's best prices on overstocked inventory, demo machines and a great selection of used equipment. We'll provide the dogs and burgers. All you need to bring is a healthy appetite for a great deal. Don't be disappointin' Dealin' Dan, now. He loves a good turnout when it comes to savin' his customers big bucks!

Empty Pesticide Container Collection and Recycling Mini Metro Collection Schedule

Recycling of empty pesticide containers will be conducted at each of the locations during the hours indicated. To participate bring clean, rinsed pesticide container to any of the sites to meet the recycling truck. Empty containers will not be accepted at the place of business prior to or after the designated times.

PRE-SEASON COLLECTION

June 28, Wednesday

8:00 AM - Noon

Hennepin Co Transportation Dept
1600 Prairie Drive (Hwy 55 & Co Rd 118)
Medina

Aug 30, Wednesday

9:00 - 10:00 AM

Washington County Fairgrounds
Lake Elmo

11:00 - 1:00 PM

Turf Supply
2797 Egendale Blvd
Eagan

2:00 - 3:00 PM

United Horticulture Supply
4841 Xerxes Ave. N
Brooklyn Center

Aug 31, Thursday

9:00 - 10:00 AM

Cal's Market,
6403 Egan Dr.
Savage

11:00 - 1:00 PM

JR Johnson Supply,
2582 Long Lake Rd
Roseville

Sept 6, Wednesday

9:00 - 10:00 AM

Washington County Fairgrounds
Lake Elmo

11:00 - 1:00 PM

North Star Turf,
3080 Centerville Rd
Little Canada

Sept 7, Thursday

9:00 - 10:00 AM

Cal's Market,
6403 Eagen Dr.
Savage

11:00 - 1:00 PM

United Horticulture Supply,
4841 Xerxes Ave N
Brooklyn Center

END OF SEASON COLLECTION

Sept 27, Wednesday

9:00 - 11:00 AM

United Horticulture Supply,
4841 Xerxes Ave N
Brooklyn Center

What's accepted for Recycling:

Only #2 HDPE rigid plastic containers
(identification on bottom of container)

No caps

Remove label sleeve and booklet

No containers larger than 55 gallon.

Empty Pesticide Container - Do's and Don'ts

Do recycle your empty pesticide containers. Recycling is an environmental sound option for container disposal.

Do rinse pesticide containers as soon as they are emptied. If containers are allowed to sit after being emptied, the product will dry inside. It is very difficult to rinse dried product out of a container.

Do rinse containers to remove all the product you paid for out of the container and onto the intended crop. Product left in the container can also affect the performance of the crop protection chemical.

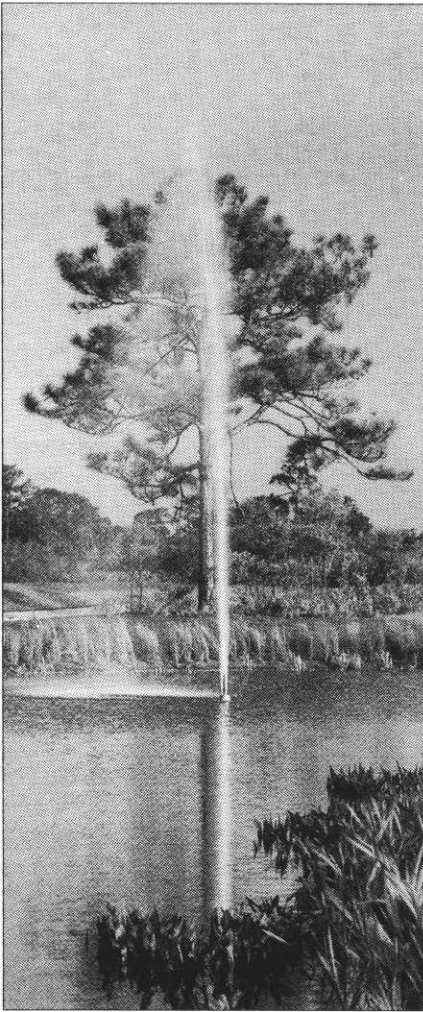
Don't recycle empty pesticide containers through the local recycling center or curbside recycling. Pesticides are a toxic product that can permeate the plastic container. The plastic should not be mixed with other recyclable materials. The empty pesticide container collection program determines the end market of the recycled plastic to ensure the end product does not come in contact with humans or animals.

Don't burn empty pesticide containers. An open fire does not burn hot enough to destroy pesticides. An open fire will cause pesticide residue to be disbursed into the air. Also, burning of pesticide containers is an illegal act in Minnesota.

For more information

about the recycling of empty pesticide containers,
contact Steve Poncin at the Minnesota Dept of
Agriculture at (651) 296-5136.
email Steve.Poncin@state.mn.us

Why choose AQUA CONTROL?



Geyser Fountains

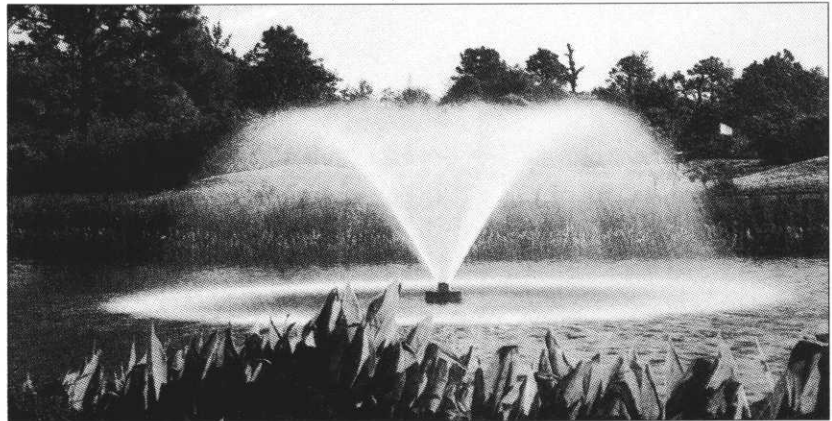
½ to 5 HP — max. heights from 20 to 60 ft.

AQUA CONTROL[®]

Only AQUA CONTROL Aerator Fountain Systems combine:

- * **unique water-intake tube design** [standard] that extends several feet below the surface and can be equipped with extensions to reach virtually any depth in your lake or pond.
- * **stainless steel propellers** with specially contoured, high efficiency blade forms.
- * **precision machined ducted shrouds** that surround the propellers to boost pressure generation and increase discharge pattern height for optimal aeration and circulation.
- * **rugged UL-Registered drive motors** that are water cooled and water lubricated [no oil to leak].
- * **an exclusive pump design** that uses low-cost, interchangeable components to let you switch from an aerator fountain ... to a decorative fountain ... and back to an aerator fountain *any time you wish.*

Aerator Fountains ½ to 5 HP — capacities from 360,000 to 1,500,000 gal/day



- * Your new AQUA CONTROL Aerator Fountain System is a 'ready-to-run package.'
- * You get everything you need to install it yourself.
- * Typical installation time is just a few hours.

**Ask your
Precision Turf Representative
for more information!**



Turf & Chemical Inc.

Your Precision Turf Sales Rep is just a phone call away.

1-800-925-8873 or 763-477-5885

Southbrook--

(Continued from Page 1)

**LOW NET
BEST BALL RESULTS
SOUTHBROOK G&CC
MAY 15, 2000**

Dennis Salwei	
Clayton Hoyt.....	60
Leroy Wurm	
Brian Peterson.....	60
Jon Almquist	
Scott Weltzin.....	63
Chris Crockett	
George Jennrich.....	63
Cris Risberg	
Brooks Ellin.....	64
Monty Montague	
Scott Turtinen.....	64
Bill MacDonald	
Eric Peters.....	65
Kevin Norby	
Scott Weltzin.....	66
Todd Loecke	
Wes Stoneback.....	66
Bob Fredericks	
Dan Hinton.....	67
Mike Redmond	
John Queensland.....	68
Steve Busch	
Tom Fischer.....	68
Tom Mundy	
Chuck Tuthill.....	69
Ben Elsenpeter	
Brian Ziegler.....	71



JEFFREY HARTMAN, PRESIDENT
 . RENOVATION . SITE DEVELOPMENT . LANDSCAPING
 . HIGH TECH DRAINAGE TECHNIQUES . DESIGN
 . EXCAVATING . GRADING

(612) 443-2958
 FAX (612) 443-3452

GOLF DIVISION

8011 BAVARIA ROAD
 VICTORIA, MN 55386

Outreaches The Pretty Boys

That's The Beauty Of A National.

21" of reel outside the wheel. That's a claim the others can't make. With a National's flexible design, sand bunkers, curbs, or any trimming tasks are well within reach.

**Contact us for a test drive:
 1-888-907-3463
www.nationalmower.com**



NATIONAL MOWER COMPANY

SINCE 1919

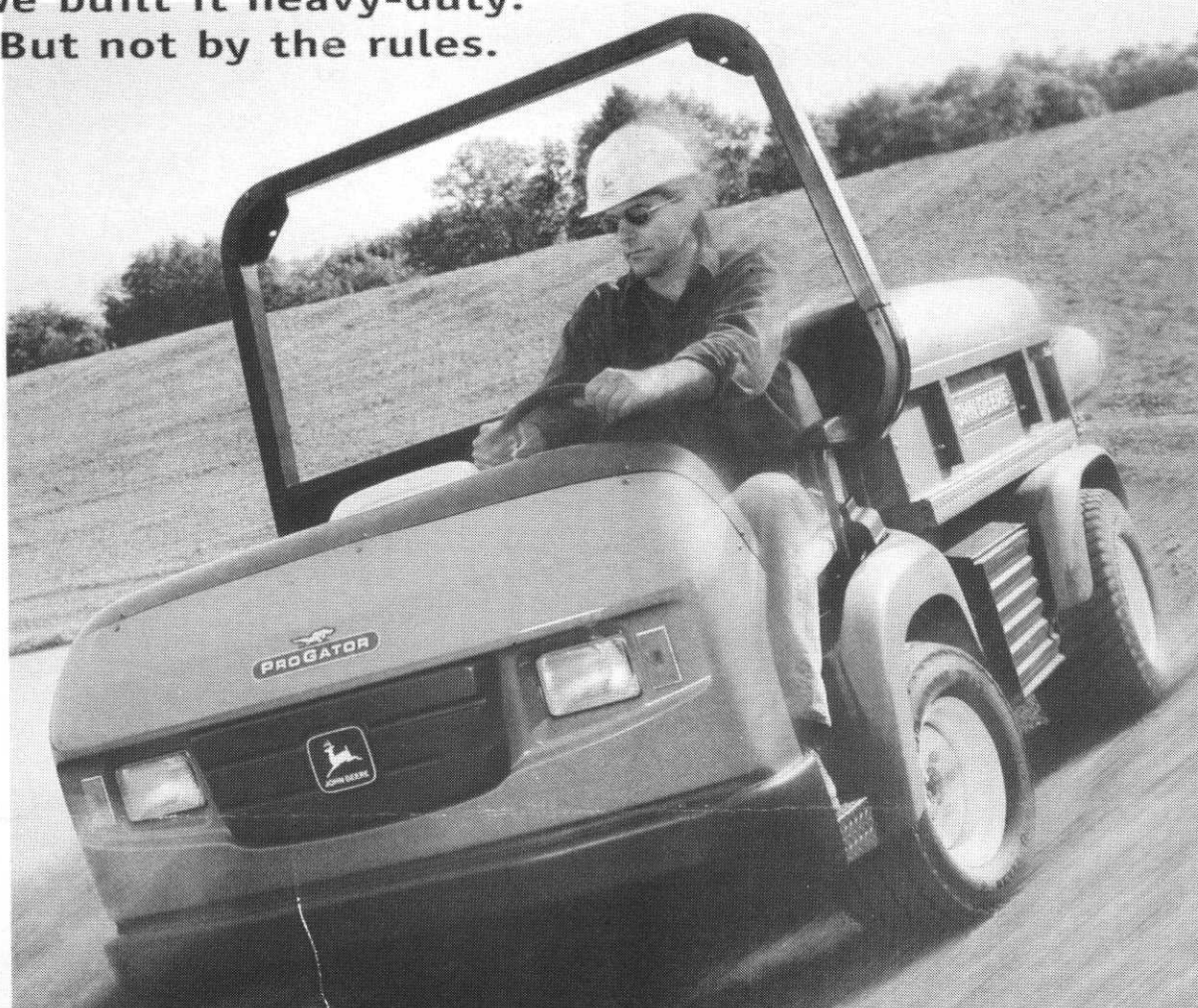
700 Raymond Avenue
 St. Paul, MN 55114
 Fax (651) 646-2887

Email sales@nationalmower.com



NATIONAL® is a Registered Trademark of National Mower Company

**We built it heavy-duty.
But not by the rules.**



The ProGator® Utility Vehicle from John Deere.

With the John Deere ProGator, the idea of a heavy-duty utility vehicle just got redefined and redesigned. No other vehicle combines the strength, reliability, and flexibility of the ProGator UV.

You can see the difference just by walking through the operator station. It's wide open, making it easy to get on and off.

Driving is a different feel as well. A five-speed, synchro-mesh transmission allows for seamless shifting — no more overlapping gears. And the

hydrostatic steering provides for precision control and tight turning.

If you have a ton to haul, then this is your vehicle. The ProGator UV weighs in with a hefty 2,650-pound load capacity. Strength also comes in the form of a one-piece axle supporting the rear wheels.

Heavy-duty for any duty. The ProGator UV has the strength and versatility you need, and the performance no other vehicle can top. Call for a demonstration today.

www.deere.com

GreenImage

12040 Point Douglas Drive S.
Hastings, MN 55033
Phone: (651) 437-7747
Fax: (651) 437-3483

Official
Golf Course
Equipment
Supplier



Nothing Runs Like a Deere®