



# ***THE SOUTH FLORIDA GREEN***

VOLUME 6

APRIL, 1979

NO. 2





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A handwritten signature in cursive script that reads "Dan Jones".

# The South Florida Green

The Official Bulletin of the South Florida Golf Course Superintendents Association

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## COVER PHOTOGRAPH

By Harry McCartha

Amy Alcott holes out on number 18 to win The Elizabeth Arden Golf Classic at Country Club Aventura.

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# GREENS CONSTRUCTION

By HUBERT E. (AL) FRENETTE

As turf management personnel, your duties may, at some time, include the construction of greens. Should this happen, you must be prepared to become completely involved. You must also be prepared to assume responsibility for any failures, as all future problems will be laid at the doorstep of the Superintendent. Any superintendent who does not believe this should never involve himself in the construction of greens.

Good putting surfaces require no special formula or magic touch. They are the result of:

1. Proper Design
2. Proper Construction
3. Proper Maintenance

On occasion, we have seen excellent putting surfaces that appear to have none of these qualities. Apparent or not, they exist.

The proper design of the green(s) should be the job of a competent architect. The responsible superintendent will insure that he has a say in the selection of the architect. It is absolutely necessary that these two individuals have the mutual respect of one for the other if the club is to get what they paid for in good faith.

Construction of the greens requires good planning and a knowledge of fundamental construction procedures. Whether you contract the job or utilize club personnel, this planning and procedure should follow a sequence such as:

1. Specifications — To date, no has come up with a better way to construct consistently good putting surfaces than to use the specifications developed by the USGA Green Section. Other methods have been developed and used with varying degrees of success. When built to specifications, there are (to my knowledge) no recorded failures of "USGA Green".

Insist on a good set of specifications and, if necessary, contact your USGA representative for assistance in preparing these specs. They will protect the integrity of your greens and may protect you in possible future litigations.

2. Materials Testing — Collect samples of all locally available materials and get a complete test of these from the USGA testing lab. It has been this author's experience that random tests by independent labs, contractor's lab or other agencies are not adequate to give you an acceptable seedbed. Your USGA lab is equipped to perform all the necessary tests to evaluate your materials and make sound recommendations.

Once the recommended materials have been mixed, additional samples should be gathered and retested to insure the mix is as recommended.



H.E. (Al) Frenette

Remember one important thing about testing; the cost is nothing compared to rebuilding.

3. Materials Purchasing — Following selection of the materials, the next step is contracting for their purchase and delivery. The contract should include unit price, delivery charges, on-site inspection of quantities delivered, delivery schedules, payment schedule, and time limits.

The most single important item for the superintendent to check is the on-site inspection of quantities delivered. If anything will come back to haunt you, this item will. Many clubs end up paying extra for materials because they did not have a handle on this operation.

The actual construction of greens should follow accepted procedures. There are ample instructions from the USGA regarding the steps to follow in the building of the green. Rather than belabor these procedures, let us look at some of the mistakes that you will want to avoid:



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1. Personal Supervision —

Check every aspect of the job yourself. Do not leave details to anyone and inspect every phase before it is buried. Absolute observance of this rule will save you a lot of embarrassment later.

2. Specifications —

Do not, under any circumstances, change the specifications without written approval from the architect or owner. Insist on having all changes in writing and keep them on file.

3. Materials —

All material changes should be approved by the architect in writing.

New materials should be tested in the lab before they are placed on the job.

4. Construction —

Attention to certain details is a good way to avoid later problems.

a. Base or Subgrade — Grade the base to the same contours as the finished grade.

b. Drains — Run all interceptor trenches perpendicular to the natural grade.

Insure that the base is graded to allow water into the trenches.

Carry all drains to a creek, ditch, or solid drain pipe. You will have to do it some day anyway.

c. Gravel — Be certain to maintain the rule of 7 diameters. Failure to do so will result in possible failure of the perched water table.

Maintain the proper contours with the aid of a depth gauge.

d. Sand — If specified, carefully place this layer to avoid mixing with the gravel blanket.

Maintain the proper contours and depth.

e. Seedbed — Off-site mixing of materials is preferred. When loading for delivery to the green, keep a minimum of 6" on the ground to avoid contamination. A paved area will eliminate this problem.

Keep a minimum of 8" of material under your wheels or tracks while spreading. This will prevent mixing of the seedbed with the course sand and gravel layers. Keep the mix free of all foreign materials.

If amendments are to be added, till them to a depth of at least 5".

To insure a good stand of turf, insist on fumigation of the seedbed.

Use a tracked vehicle to firm the seedbed prior to a final contouring.

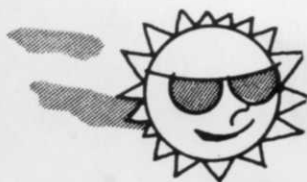
Use a depth gauge to maintain proper contours and avoid differences in the depth over the entire green and collar. Differences could cause moisture variations in stress periods. Allow ample area for a collar of about 36" width.

Float the surface to remove irregularities and to eliminate excessive topdressing after turf establishments.

The seedbed, at this point, should be firm enough to resist foot printing.

f. Irrigation — Keep all pipes and sprinklers outside the seedbed area, including the collar.

Keep all controls and valves outside the maximum radius of the sprinklers. Provide proper access to the valves and wire connections.



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Provide a manual valve and coupler for each green. Leaving the coupler live will allow watering in emergencies.

Avoid excessive coverage of the green area. A maximum of 120 gpm with 100% overlap should suffice.

- g. Planting — Hydro-mulch appears to be the most satisfactory method of applying seed or stolons to the surface.

Avoid excessive rates to prevent excess mortality rates. Rates of 1-1½ lbs. seed or 8-10 bu. stolons per 1000 appear to be quite adequate.

Use controlled watering during germination periods to control seed rot or drying.

Mow the new turf at the earliest possible date. Start the mowing at about 3/8".

As you may note, no recommendations are made for fertilizers or chemical applications. Starter fertilizers should be included in the specs. And chemicals may or may not be included. Your own good judgment should determine these requirements.

Let me sign off with this one thought:  
"When the smoke clears and the architect and contractor have been paid and are gone; you, the Superintendent, will answer for all the mistakes that were made during the construction of the greens."

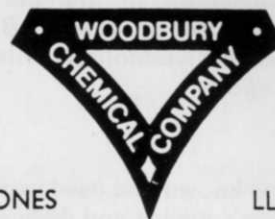
**EDITOR'S NOTE:**

*Al Frenette, C.G.C.S., is Golf Course Superintendent at the Peachtree Golf Course, Atlanta, Georgia. Mr Frenette is also Past President of the Southern Turf Grass Association*

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# THE MUSSER FOUNDATION

A Brief Review

By FRED V. GRAU, President



Fred V. Grau

Part of the first monies collected for The Musser Fund went to help Dr. Burton get his turf program started in Tifton. Now Dr. Burton is on the honorary board of The Musser Foundation. Many things could be accomplished in the South through this Foundation, but so far no support has come from our area. Lets stand up and give our financial support for a Musser Fellowship to combat some of the problems facing golf courses in the South.

**EDITORS NOTE:** We welcome Dr. Grau to our esteemed list of guest writers. We will eagerly await his future articles. During the depression Dr. Grau worked his way through four years of college and his Ph.D. When he became U.S.G.A. Green Section Director he began at once to develop a fund to help graduate students. In 1953 Dr. Grau became a consultant to manufacturers and the graduate program was dropped. When H.B. Musser died he saw a chance to develop a foundation in his memory and to renew the graduate effort.

**Penncross bent** is known and used world wide. It is the product of Burt Musser's genius and dedication. It was one of his "investments in the future". Playing conditions on golf courses have been improved greatly by the use of Penncross bent, the first seeded bent to produce uniform playing surfaces.

**Pennlawn fescue** has improved millions of lawns and is favored in mixtures with bluegrass for producing quality sod. It, too, was developed under Professor Musser's guiding hand.

The book "Turf Management" was written by Professor Musser under the sponsorship of the U.S. Golf Association. What a boon it has been to golf course superintendents!

Golf course superintendents who studied at Penn State under this pioneer teacher are scattered 'round the world. What a wonderful way to make an "investment in the future" because now they are teaching others.

Among the graduate students who earned (and I mean earned) their Ph.D. degrees at Penn State under this "task master" are:

- Dr. James R. Watson, v.p. Toro Co.; 2nd v.p. MITF
  - Dr. Joseph M. Duich, Prof. Turfgrass Science, PSU; secretary, MITF (incorporator)
  - Dr. John C. Harper II, Extension Agronomist, Penn State
- These men are leaders — a credit to the profession. The turfgrass industry has been enriched by their activities.

We honor the memory of this pioneer in turf by establishing a Turfgrass Research Fellowship Fund in the Musser Foundation which will perpetually assist deserving graduate students to achieve their degrees and to take their place among the leaders in the turfgrass industry. Some of our current scientists are facing retirement. We must provide for their replacement. These are the men who brought this Living Memorial into being as INCORPORATORS:

- Dr. J. M. Duich
- Mr. Albert W. Wilson II
- Mr. E. R. Steiniger
- Dr. Fred V. Grau
- Mr. Warren A. Bidwell

Many others have been supportive. The Pennsylvania Turfgrass Council gave it a start when Don Krigger, then president of PTC in 1968, named Grau to head the organizing committee which included names well known in the turf industry: Hallowell, Harper, Mascaro, Miller, Shuman, Sirianni, Stolpe, Steiniger, Tenos, Watson, Wilcox and Wilson.

These contributors started the Fellowship Fund with money out of their pockets (total \$475.00):

- Philadelphia Toro Co.
  - Frank I. Shuman
  - Fred. V. Grau
  - Dr. J. M. Duich
  - GCSA of N. California
- They believed in the future.

Professor Howard Burton Musser initiated turf work at Penn State in 1927. The first turf conference came in 1929. He died in 1968. He was active in organizing the Pennsylvania Turfgrass Council in 1955. His work with bluegrasses laid the foundation for Pennstar Kentucky bluegrass. In weed control work he successfully blended chemicals with fertilizers.

The Musser Foundation is one of three non-profit groups which accept contributions and raise funds in other ways in order to perform needed research and to improve the quality of turf and turfgrass management. The Noer Foundation operates independently and does not conflict with Musser Foundation goals and objectives. The third group is the newly-formed American Council for Turfgrass (ACT), a group designed to correlate activities and to provide a unified voice for turf in the nation.

The Musser Foundation has grown slowly partly because many have misunderstood its function. MITF raises money in several ways, all tax-exempt:

- 1) Free-will contributions
- 2) Unitrusts which provide lifetime income (planned giving)



3) Memorial giving — funds instead of flowers to yield income forever to help students of turf.

4) Turfgrass Benefit Tournaments. There have been twelve of these: 5 in Ohio; 4 in Oregon; 3 in Delaware. One is planned for the Mid-Atlantic region June 12, 1979 at Indian Spring C.C., Silver Spring, MD. This is a painless way to raise money by having fun.

5) Turfgrass Research Fellowships named for the donor, \$1,000 each. This approach is designed to let those who profit through sales & services to share with a tax-exempt foundation that will put money to work for turfgrass improvement across the board. It includes manufacturers, distributors, dealers, seed producers, sod growers, landscape contractors, golf course architects, lawn care companies and others. Actually no one is excluded. Two such fellowships now exist in the name of individuals, Fred. V. Grau and Bob Dunning; and one in the name of a seed-growing firm, the Penncross Bluegrass Association.

The Musser Foundation is run by a board of 24 directors with an Honorary Board to lend prestige. All serve without pay. The annual meeting is held in conjunction with the GCSAA Conference and Show. All monies are turned over to the treasurer, Ben Warren, who invests it in secure high-yield securities. Only the income is used for grants to exceptional graduate students at turf-oriented research institutions to help them obtain advanced degrees. By this method the entire turf industry gains valuable research data by way of a learned thesis and, a new leader has been trained!

Other officers are:

Fred V. Grau, president

Joseph M. Duich, secretary

Warren A. Bidwell, first vice president

Dr. James R. Watson, second vice president

Dr. Frank Dobie is Director of Benefit Tournaments

Anyone wishing further information on any of the several fund-raising efforts may write to Dr. Fred V. Grau, P.O. Box AA, College Park, MD 20704, or phone 301/864-0090.

Most turfgrass managers are aware that the *Ataenius* beetle threatened turf with multi-million dollar damages. The Musser Foundation pooled its resources with the GCSAA and Ohio golf clubs over a 3-year period to support research aimed at life history and control. The joint efforts paid off and Mr. Gerald Wegner, a student under Dr. Harry Niemczyk, Wooster, Ohio, expects to have his thesis finished soon. Thus another scientist has been trained and every phase of the turf industry will profit.

The misuse of tax funds has made it almost useless to look to this source for assistance. Those in the industry who operate for profit should face up to the fact that they have a responsibility to build a FUND that will be self sustaining for now and in the future. Fellowships offer the ideal way to perform needed research, accumulate valuable data, produce a learned thesis and, most important of all, develop a trained scientist who can become a leader in the industry. The Musser Foundation is the ideal vehicle by which these benefits can be accomplished. We need to share and to work together. As George Cleaver, president of GCSAA, has said, "Let's Communicate, Cooperate and Coordinate."

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**Power Source:** 18 horsepower OMC engine, tightly compartmentalized. Ground speed 0 to 22 mph.

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**Braking:** Hydraulic internal expanding.

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**Payload:** 1000 pounds.

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**Suspension System:** Torsion bars, leaf springs, front and rear shocks.

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**Dump Construction:** Single wall.

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**Headlights:** Single.

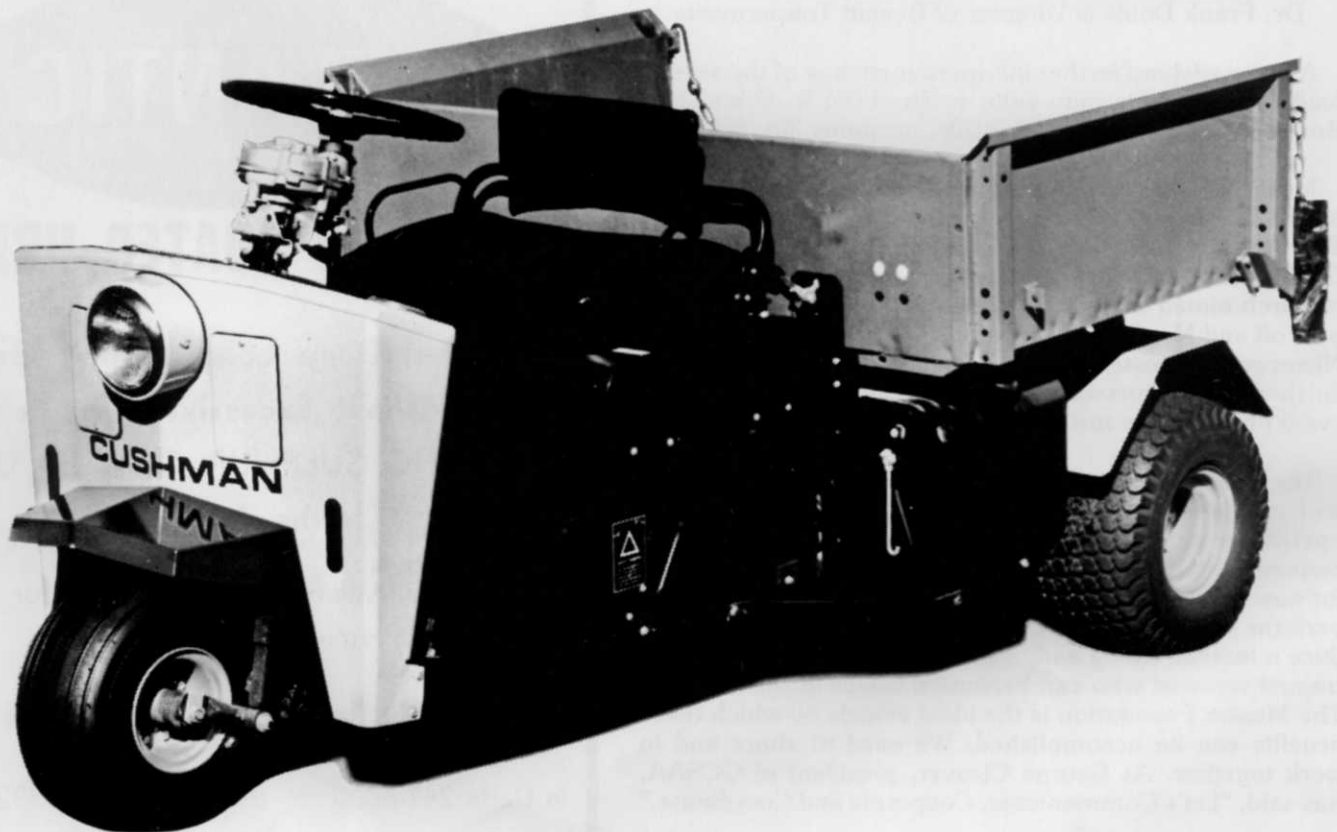
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**Seating:** Single seat for one passenger with back rest and hip restraint.

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**Dump Construction:** Heavy duty diamond plate steel with rugged rear bumper for heavier loads and longer life. Easily convertible to flat bed.

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**Headlights:** Dual lights for greater night vision.

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**Seating:** Dual seats for two passengers with individual back rests and hip restraints, constructed for larger men, greater comfort.

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**Price:** Virtually the same.

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# NEMATODE SURVEY

By MARIA T. CINQUE  
Agricultural Extension Agent,  
Nassau County Cooperative Extension,  
Garden City, NY

Nematode problems, especially on turfgrass, have mostly been associated with the south. In recent years there have been some unexplainable problems on Long Island Golf Courses. It was therefore decided to see if nematodes were playing a part in those problems.

The soil samples were taken between June and August. This is the time of the year when nematode populations are usually at their highest and damage from plant-parasitic nematodes is most evident. In most cases, the Golf Courses sampled had problems during the hot weather of previous years, that sounded like they could have been caused by populations of nematodes. Others were chosen because they were having problems that could not be attributed to a disease, insect or cultural practices.

In most cases, soil samples were taken from both the greens and fairways, where damage was evident, soil samples were taken from right outside of the chlorotic or necrotic areas at a depth of six to eight inches, with a soil probe.

Many samples were checked for the presence of insects and diseases and nutrient levels were also determined.

Not all nematodes are capable of causing injury to plants, only those which possess a stylet are considered to be parasitic. Nematodes are extremely small round worms and CANNOT be seen without the aide of a microscope. The stylet which they possess is even smaller and in some species is rather difficult to determine.

The following nematodes were isolated from Long Island Golf Courses.

NEMATODE	COMMON NAME
Criconemoides sp.	Ring
Hoplolaimus sp.	Lance
Tylenchorhynchus sp.	Stunt
Pratylenchus sp.	Lesion
Longidorus sp.	Needle
Tichodorus sp.	Stubby Root

All of the above named nematodes do possess a stylet which can cause injury to the grass plant. A stylet is a narrow (microscopic) hollow, slender tube which the nematode uses to withdraw plant juices and therefore hindering the plants ability to take up water and nutrients.

The damage seen during the stress period of the summer was mostly chlorosis, where the turf looked as if it hadn't been fertilized, even though it had been. In most of these areas, high populations of the Ring Nematode, *Criconemoides* sp. (300-1,000/100 cc of soil), had been found. Other damage observed was a complete killing out

of the turf (penncross bentgrass) on greens. In these areas, high populations of the Lance Nematode *Hoplolaimus* sp. (350-950/100 cc of soil) were found.

Less damage was observed during periods of cooler temperatures rather than those of high temperatures. It was also observed that in periods of moisture stress, damage from plant-parasitic nematodes was more evident.

## Sampling to Continue

I would like to continue sampling Long Island Golf Courses for the presence of plant pathogenic nematodes. The sampling techniques for nematodes is different than for other soil tests. The soil to be tested should be taken just outside of the chlorotic or necrotic areas and to a depth of 6 inches or as far as the roots go down. The grass from the plug can also be included in the sample. It is better to use a soil sampling tube rather than a hole cup cutter. Take samples around the entire areas, mix the soil and submdt 2 cups of soil for analysis.

Samples should be kept out of the sun and kept COOL (refrigerated) until they are brought to the lab. If you send samples in, be sure that my name is on the box and mark it in bold letters: NEMATODE SAMPLE - REFRIGERATE.

Samples should be sent to MARIA T. CINQUE, Nassau County Cooperative Extension, 320 Old Country Road, Garden City, New York 11530. There is a \$6.00 charge per sample or \$10.00 to Nematology Lab, Cornell University, Ithaca, N.Y. 14853.

Late June to early September is the best time to sample for plant-parasitic nematodes.

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# TOP DRESSING

By EARL GREY  
Indian Creek Country Club

As our teeth chattered at 6:30 A.M. January 13, 1979 the reality of the weatherman's forecast two days prior was now present! The thermometer now registered 43° as compared to 75° just the day before.

Forehand knowledge of the probable weather we were about to experience motivated us to finalize our last minute details for topdressing all 18 greens as well as our practice putting green.

The night before we were to get started we loaded a truck full of 70% sand 30% muck sterilized. This we parked inside the maintenance building to insure dry topdressing and also for a cleaner operation. We additionally prepared our top dressing machine, truckster, dragmat, shovels, etc. so that we could move quickly to the operation site immediately the next morning.

Before we charge No. 1 green it would be good to note that we had been foliage feeding our Tifton Dwarf Greens with 6'N-12'Fe-6'Sul at 15 lbs per acre in 125 gallons of water every 5 to 7 days. The roots had been receiving a steady diet of 17-2-7 I.B.D.U. 5% quick release at 2 lbs act nitrogen per 1,000 sq. ft. every four weeks. This formula was sufficient considering the erratic weather we were experiencing the past 30-45 days. We were also topdressing every 14-20 days at one yard mix per 5,000 sq. ft. with an automatic topdressing machine.

Until Jan 3rd our greens were still growing but a more severe test was to be dealt with this day with 43° looming over the course. Another unique feature about this chilly morning was that everyone had this undying love for hot coffee which could be observed by the reluctance to leave it and to join the cold outside!

We closed in on green #1 quickly and in 10 minutes at 6:50 A.M. #1 was topdressed. We then tied our spreader to the utility vehicle for faster transport and proceeded to green #2. With time being foremost at 7:50 A.M. we sent a man with the utility wagon (when not being needed) to green ÷ 1 to finish dragging in the soil. Immediately behind him followed a triplex greensmower with baskets to help clean any debris left over on the green. And at 8:05 A.M. our first green was ready for play and we allowed one full hour for drying.

The program was completed by working through lunch to 1 P.M. We were able to avoid play. Our greens average 6,500 sq. ft.

The next mornings temperature read 53° and a warming trend followed. A day later we observed that the course had lost some vibrance, but our greens held their color and growth pattern! We attribute this continued growth on our Tifton Greens in part to the sweater-like approach topdressing has, partly covering and warming them in the cold winter months.

## TOP DRESSING DURING HEAVY WINTER PLAY

### MINI TIPS TO SPEED TOPDRESSING PROCEDURE DURING PLAY:

- A. Greens should be as dry as possible! Irrigating early the night before or not at all is best! This will make the operation a cleaner one.
- B. Load dry topdressing on a truck and park it inside a covered building to insure dry dressing and save morning loading time.
- C. Begin operation in the center of green in a circular fashion and work toward outside edge to avoid driving over dressing which may clump and prevent or slow drying.
- D. For speedier traveling, transport power top dresser with utility wagon between greens.



**SOUTHERN MILL CREEK  
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# Our customers have been wanting a rugged mid-sized rotary that really maneuvers.

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It's the amazing Jacobsen Turfcat.

Because it's so maneuverable, it gets your medium-sized mowing jobs done faster and better than ever.

You can have it with either a 50" or 60" deck. (They're interchangeable.) You get a smooth, even cut with practically no scalping because the fully articulated deck closely follows ground contours.

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And you can steer and maneuver while you change speeds because of the foot-operated hydrostatic drive.

The husky 18-HP Kohler engine makes hill climbing a breeze.

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The more you hear about the amazing Turfcat, the more you'll know we've been listening to our customers.

We hear you.

## DEBRA TURF & INDUSTRIAL EQUIPMENT CO.

HOLLYWOOD TAMPA / FT. MYERS





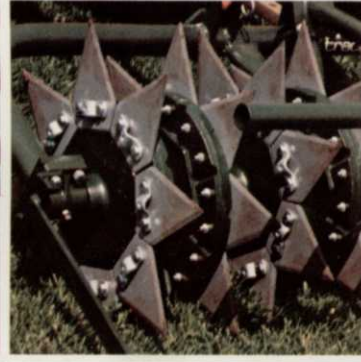
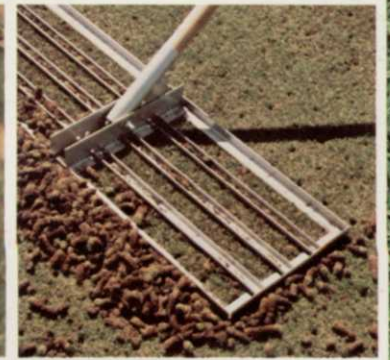
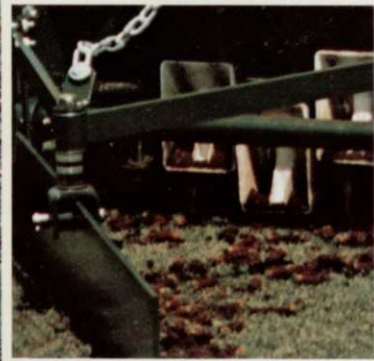
**Hector**

**TURF & GARDEN, INC.**

and  
**RYAN**®  
present...



# RYAN<sup>®</sup> TURF-CARE EQUIPMENT 1979 CATALOG



# GREENS AERATION

Your greens suffer through more use, abuse and compaction than any other turf area on your course. Golfers, caddies, superintendents and maintenance crews are constantly compacting the soil and grasses on them until water and fertilizer are unable to penetrate to root systems.

So, how do you combat these common yet serious problems? By aerating with Ryan® Turf-Care equipment.

Ryan Turf-Care equipment is specifically engineered to penetrate and remove a measured amount of soil, grass and roots. This allows for root expansion, water absorption and fertilizer penetration. Yet Ryan Turf-Care equipment is fast and efficient on the job.

Aeration with Ryan equipment is normally done once in the Fall and once in the Spring. But if your greens are easily compacted, aeration up to 6 times a year may be necessary.

So keep your greens springy, rich and deep-rooted with the standard of the industry in turf care... Ryan aeration equipment.



Greensaire II tines penetrate up to a full 3 inches.

## GREENSAIRE® II

The self-propelled Greensaire II was specifically designed for greens care. This versatile aerator offers 4 sizes of tines ranging from 1/4 to 5/8 inch in diameter. These tines penetrate the green up to 3 inches on 2-inch centers removing 36 cores from every square foot. It will aerate up to 8,000 sq. ft. per hour.

In addition, the Greensaire II covers a wide 24-inch swath and with an optional windrow attachment, makes for easy core cleanup on the green.

### GREENSAIRE II SPECIFICATIONS MODEL 544801

<b>Width</b> .....	24" swath, 47¾" overall.
<b>Speed</b> .....	Aerates up to 8,000 sq. ft. per hour—Transport (Std.) over 4 mph.
<b>Tines</b> .....	Hollow, tapered, made of case hardened steel. Two sets of ½" diameter tines standard. Hydraulic lowering and raising.
<b>Depth and Spacing of Penetrations</b> .....	3" deep on 2" centers.
<b>Engine</b> .....	4-cycle, 8 hp with 6 to 1 gear reduction.
<b>Drive</b> .....	Roller chain throughout, except V-belt to hydraulic pump. Full automotive-type differential.
<b>Clutch</b> .....	Multiple disc clutch.
<b>Connecting Rods and Bearings</b> .....	Cast aluminum with automotive-type insert bearings on ductile iron crankshaft.
<b>Tires</b> .....	Pneumatic turf tires. Front 11 x 4.00-5. Rear 13 x 6.50-6.
<b>Lubrication</b> .....	Cams, horizontal push rods and bearings run in oil in sealed cast cam case. All other lubricating points are pressure grease fittings.
<b>Weight</b> .....	805 pounds.
<b>Optional Equipment</b> .....	¼", ⅜" and ⅝" tines. Windrow attachment. Carbide tipped ½" tines.

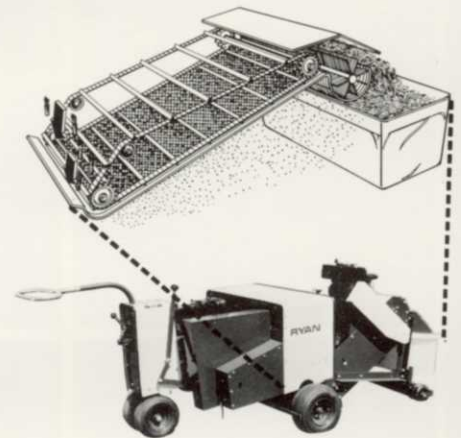


Greensaire II with optional windrow attachment.

## CORE PROCESSOR

The Ryan Core Processor is a proven self-powered unit that fastens exclusively and securely to the Greensaire II.

The Core Processor catches the cores the Greensaire II ejects during its aerating process. Separates most soil from thatch and plant material, sifts the good soil back on the green, and catches the leftover material in a big 2.3 cubic foot debris catcher.



You save money and manhours because you aerate, top dress and collect thatch all in one pass while leaving your greens in playable condition.

### CORE PROCESSOR SPECIFICATIONS MODEL 544809

<b>Width</b> .....	41½" overall.
<b>Height</b> .....	35½" overall.
<b>Length</b> .....	43½" overall.
<b>Engine</b> .....	4-cycle, 3 hp, with 6 to 1 gear reduction. Recoil starter.
<b>Drive</b> .....	V-belt. 1 to 1 drive ratio engine to separator brush (550 rpm max.).
<b>Drive</b> .....	#40 roller chain—2.5 to 1 drive ratio (220 rpm max.).
<b>Conveyor</b> .....	Steel, detachable chain with aluminum attachment links.
<b>Conveyor Speed</b> .....	19.4 flights/min. to 330 ft./min. max.
<b>Separator Brush</b> .....	Polypropylene bristles. Also serves as a cleaner for conveyor flights.
<b>Separator Screen</b> .....	Triple shoot woven wire.
<b>Gate</b> .....	Expanded metal carbon steel.
<b>Wheels</b> .....	Dual-castered 5" dia. x 3" wide solid rubber. Articulated mounted.
<b>Wheel Base</b> .....	Fore & aft: 32½" Side to side: 32¾"
<b>Guards</b> .....	Drive belt—chain guarded with 18 gauge metal guards.
<b>Attachment</b> .....	Hooked onto attachment arms bolted to sides of Greensaire II cam case. Locked on by spring detented locks on arms.
<b>Debris Catcher</b> .....	Polypropylene & vinyl with metal handles 11½" x 11½" x 29¾"—2.3 cu. ft.
<b>Weight</b> .....	278 lbs.



CORE PROCESSOR

RYAN

GREENSAIDE II

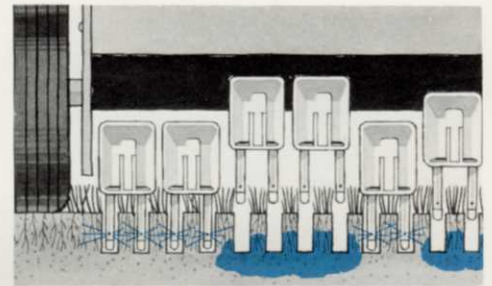
RYAN



## GREENSAIRE® II INJECTOR

The Ryan Greensaire II Liquid Injector is the latest addition to the Ryan Turf-Care system for golf courses.

The Injector is engineered to inject chemicals at root level through four tiny jets in each tine. This results in less chemical waste, less total use of chemicals, and less chemical runoff. Because, with the Injector chemicals don't have to be "watered-in" to be effective, and nematodes living on root systems are controlled.



In addition, the job is done quickly. One man can aerate and inject up to 8,000 square feet in an hour; putting in 36 holes per square foot.

To use the Injector, simply attach the Ryan injector tines and valve system to any Greensaire II aerator. Connect the main hose to a chemical tank with 150 to 300 pounds of pressure per square inch, and you're ready to care for your turf the Ryan way.

### GREENSAIRE II INJECTOR SPECIFICATIONS MODEL 545430

Gallons Injected Per 1000 Square Ft. ....	7.25.
Depth .....	Up to 3"
Pattern .....	2" x 2" (36 holes per square ft.).
Swath .....	24"
Max. Working Pressure .....	300 PSI.
Construction .....	Corrosion resistant material with ceramic parts at high wear points.

## GREENSAIRE® 16

The Greensaire 16 is the original Greensaire. It's in use at hundreds of golf courses across America and is the standard of the industry.

Like the Greensaire II, its tines penetrate up to a full 3 inches, it puts 36 holes in every square foot of turf, and 4 sizes of tines, from 1/4 to 5/8 inch in diameter are available.

The Greensaire 16 is powered by a hefty 6½-hp 4-cycle, air-cooled engine that lets one man aerate a 16-inch swath and up to 4,000 square feet of turf an hour. For easy cleanups, an optional windrow attachment is available.

### GREENSAIRE 16 SPECIFICATIONS MODEL 544843

Width	16" swath, 35½" overall.
Speed	Aerates up to 4000 sq. ft. green in approximately one hour—Transport—(Std.) over 3½ mph.
Tines	Hollow, tapered, made of case hardened steel. Two sets of ½" diameter tines standard. Lowered and raised by hand lever.
Depth and Spacing of Penetrations	Over 3" deep on 2" centers.
Engine	4-cycle, 6¼ hp with 6 to 1 gear reduction.
Drive	Roller chain and dual V-belts.
Clutch	Belt tightener clutch.
Connecting Rods and Bearings	Cast aluminum with insert bearings on crankshaft end and ball bearings on wrist pin end.
Crankshaft	Ductile iron with ball bearing mains.
Tires	Fully pneumatic turf tires, 10 x 3.50-4.
Lubrication	Cams, horizontal push rods and bearings run in oil in sealed cast cam case. All other lubricating points are pressure grease fittings.
Weight	495 pounds.
Optional Equipment	Windrow attachment: ¼", ⅜", and ½" tines; Carbide tipped ½" tines.

## LEVELAWN™

The Ryan Levelawn is a combination core rake and top dressing leveller. It's a lightweight, easy-to-handle tool that makes core cleanup simple.

To use the Levelawn, push it over the green to be smoothed out and your aeration cores will pile up easily . . . 30 inches at a time.

And the Levelawn's five levelling edges make it ideal for the many spreading and top dressing materials that will be put on your greens throughout the year.

### LEVELAWN SPECIFICATIONS MODEL 544738

Rake Head	Welded-steel construction.
Rake Head Size	10" x 30"
Handle	Hardwood with steel pivot (180°) head attachment.
Handle length	6 ft.
Weight	5.5 lbs.



# LARGE AREA AERATION

Golf course fairways, athletic fields, parks, playgrounds, and many other large turf areas need aeration too. Over a period of time, athletes, bands, ground crews and spectators contribute to compacting soil and grasses on these areas. Compaction problems even occur with seasonal changes in temperature and weather.

To relieve such a broad spectrum of compaction problems, aeration with Ryan Large Area Aerators is recommended.

By removing specific amounts of soil, thatch and roots, Ryan aerators help promote softer, springier turf areas; areas that make for better playing surfaces, and allow water and fertilizer to be easily absorbed.

Ryan aeration equipment can also save you money by improving your overall turf maintenance program. Several size and shape tines are available for various weather conditions and soil and grass types. Ryan equipment has been proven efficient and durable through years of on-the-job use around the world.

Ryan Large Area Aerators . . . for the big jobs.

## TRACAIRE®

For large level turf areas such as athletic fields, Ryan recommends you aerate with the Tracaire. Tracaire is easy to use and mounts on a tractor 3-point hitch. It has a wide 6-foot aeration swath, and can be equipped with coring, slicing or deep spoon tines. A 12-foot dragmat used for breaking up cores while aerating is also available.

### TRACAIRE SPECIFICATIONS

#### MODEL 544423

12 wheel

Width of Swath . . . . . 6 feet.

Over-All Width . . . . . 75"

Aerating Pattern . . . . . 6" x 6"

Operating Speed . . . . . Up to 10 mph.

Aerating Wheels . . . . . 68 lb. (without tines) weight per wheel, eight tines per wheel. Bronze bushings on 1 1/4" dia. axles.

Dragmat . . . . . 12' wide by 10' long. 6 gauge steel wire mesh with knuckled edges. Heavy steel bar on leading edge. Brackets and chains included.

Tines . . . . . 8 per wheel. One set standard, choice of coring (1/2" or 3/4"), slicing (7 1/2" or 6" overall length) or open spoon. Wheels can be mounted with double set of tines.

Hitch . . . . . Standard 3-point tractor hitch.

Frame . . . . . 2 1/2" OD extra strong tubular steel.

Lubrication . . . . . Pressure grease fittings.

Weight . . . . . 1,037 pounds.

Optional Equipment . . . . . 12' x 10' dragmat.



CORING TINES

SLICING TINES

OPEN SPOON TINES

## RENOVAIRE®

The Ryan Renovaire is ideal for controlling thatch and aerating compacted turf on rolling or undulating land. Because a Renovaire follows the "lay of the land."

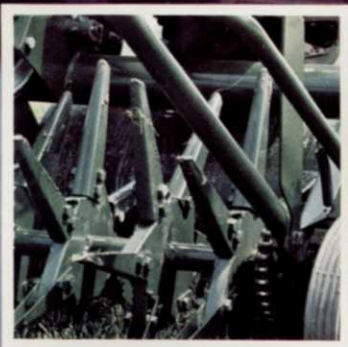
This large area aerator features tine wheels that are independently mounted in pairs, a design that permits maximum tine penetration in low as well as high areas.

Renovaire is fast, too. One man can aerate a 6-foot wide swath at speeds up to 10 mph. And your Renovaire can be equipped with a 12-foot wide dragmat to break up aeration cores during aeration.

### RENOVAIRE SPECIFICATIONS MODEL 544317

Width of Swath	6 feet
Over-All Width	8 feet
Aerating Pattern	6" on center (approx.)
Operating Speed	Up to 10 mph
Transport Speed	Can be towed behind truck or car at normal driving speed.
Aerating Wheels	Twelve spaced at 6" intervals, 75 lb. weight per wheel, eight tines per wheel. Clamped to frame in pairs.
Tines	8 per wheel, 96 per set. One set standard, choice of coring (1/2" or 3/4"), slicing (7 1/2" or 6" overall length) or open spoon. Wheels can be mounted with double set of tines.
Transport Wheels	4.80/4.00 x 8" six-ply pneumatic tires.
Side Rails	3/4" x 2" flat bar steel
Hand Hydraulic Pump (Optional)	2,500 psi capacity
Lubrication	Pressure grease fittings
Weight	1445 pounds
Weight Trays	Set of 6 included
Dragmat (Optional)	12' wide by 10' long, 6 gauge steel wire mesh with knuckled edges. Heavy steel bar on leading edge. Brackets and chains included.
Direct Tractor Hook-up	Use hydraulic hose with connectors to connect to tractor hydraulic system and to Renovaire cylinder. (Obtain locally).
Optional Equipment	12' x 10' dragmat.





# LAWN AERATION

## LAWNAIRE® III

The Ryan Lawnaire III is a professional aerator that was designed for home lawns and other areas where a larger aerator is unnecessary. Self-propelled by a rugged 4-cycle engine, the Lawnaire III aerates quickly across a 19" swath. Its water-filled drum adds up to 55 pounds of weight for tine penetration up to 2½" deep.

The uniform pattern of holes left by the Lawnaire III allows air, water and fertilizer to reach roots, aiding expansion and growth.

A single clutch-throttle lever on the handlebar makes operation of the Lawnaire III simple. And an optional tote trailer is available for convenient transportation.

### LAWNAIRE III SPECIFICATIONS MODEL 544850

**Engine** ..... 4-cycle, 3-hp Briggs & Stratton #80252 with 6 to 1 gear reducer. Recoil starter. Piston displacement 7.75 cu. in. (127cc). Governor set at 3300 RPM-no load. 2 qt. fuel tank. Lo Tone muffler.

**Clutch** ..... Belt tightener type-controlled from handlebar.

**Chassis** ..... Welded construction.

**Drive** ..... Primary: V-Belt—4L section to clutch idler. Secondary: #40 roller chain to tine assembly. Transport: #40 roller chain to barrel.

**Axles** ..... ½" dia. bolted to side plate with Oilite bearings both ends.

**Lubrication** ..... Grease fitting in each axle hub.

**Reduction** ..... Speed reducer to aerating tine wheel 11.6 to 1. Speed reducer to transport water barrel 9.75 to 1.

**Wheels** ..... One water barrel front 11" dia. (6.6 gal. capacity) 2 semi-pneumatic 8 x 1.75 with sealed ball bearings.

**Speed** ..... Transport: 178 F.P.M.; Aerating: 150 F.P.M.

**Tines** ..... Spoon-type, formed from ½" medium carbon steel, sharpened and hardened for long life. 30 tines per aerator.

**Aerating Width** ..... 19"

**Aerating Depth** ..... Up to 2½"

**Aerating Pattern** ..... Approx. 3¼" x 7" center to center.

**Controls** ..... Single lever, clutch-throttle lever on handlebar.

**Net Weight** ..... 145 lbs. dry; 200 lbs. (aerating drum full of water)

**Dimensions** ..... Width 28"; height in aerating position 38" approx.; height in transport position 47"; length 48" approx.

## TOW LAWNAIRE®

For larger grounds and turf areas the tow-type Lawnaire is ideal. The tow-type Lawnaire can be pulled by most 7-hp garden tractors or riding mowers, and delivers the same superior performance as the Lawnaire III. And for varying turf conditions, a choice of coring, slicing or open-spoon tines is available with the tow-type Lawnaire.

### TOW-TYPE LAWNAIRE SPECIFICATIONS MODEL 554702 TRACTOR-DRAWN

**Width of Swath** ..... 36"

**Overall Width** ..... 45"

**Aerating Pattern** ..... 6" on center (approx.).

**Tines** ..... 8 per wheel. One set standard, choice of coring (½" or ¾"), slicing, open spoon. Double set of tines may be mounted on each wheel.

**Hitch** ..... Pin type. Attaches to garden tractors and larger riding mowers. Operates at mowing speeds.

**Weight** ..... 516 lbs.





# MOWING

## COMMERCIAL MOWER

For performance, reliability and sheer ruggedness, in our opinion, there's no match for the Ryan Commercial Mower. Its hard-working, 2-cycle engine keeps the power coming, even in tall or dense grass. And a solid state electronic ignition means quick starts with no points to adjust or replace.

The Ryan Mower gives you total control, with 2 engine speeds and 5 adjustable cutting heights. The big, 1.25-gallon fuel tank means fewer refills. And a quick fold-down handle makes storage and transportation easy.

On-the-job durability comes from a tough 12-gauge steel housing. For additional protection, the engine is surrounded by a tubular steel frame.

And to further reduce downtime, the Commercial Mower features Ryan's exclusive modular parts replacement system. So instead of wasting time and manpower replacing a single part, you can quickly replace the entire component.

### COMMERCIAL MOWER SPECIFICATIONS MODEL 544857

Cut	20"
Height of Cut	5 positions (1½" to 3½")
Housing	12 ga. steel
Engine	OMC 2-cycle
Starting	Finger-tip starting
Ignition	Solid state electronic
Throttle	Two speed
Muffler	Under the housing
Wheels	Needle bearing steel wheels
Fuel Tank	1¼ gal.
Weight	76 lbs.
Colors	Green & evergreen
Handle	Fold down, quick release



# POWER RAKES

Ryan power rakes are designed to remove the proper amount of thatch from turf areas. Thatch is a term describing dead and dying plant materials that collect between the soil and living blades of grass. Even though thatch is the result of good growth, too much of it can prevent air, water and fertilizer from reaching plant roots.

The "average" home lawn should be power raked in the spring and once more in the fall for thatch removal, renovation or reseeding. Fine turf areas, like a golf course green may need monthly thatch removal. And Ryan has the power rakes to get the job done.

## THIN-N-THATCH

The Ryan Thin-N-Thatch power rake was designed especially for dethatching home lawns. It's a lightweight machine with simplified controls that make it easy for anyone to dethatch like a pro. There's even a fold-down handle for easy storage and transportation.

But the Thin-N-Thatch delivers the same kind of professional performance you get from the larger Ryan power rakes. An efficient 3-hp engine drives carbon steel flail blades across a 15" swath of turf, dethatching and cutting out low-growing weeds. Height adjustment lets you cut from 5/8" above ground to ground level.

The Thin-N-Thatch also includes a reel clutch and flexible rear shield for safety.

### THIN-N-THATCH SPECIFICATIONS MODEL 544848

**Engine** . . . . 4-cycle, 3-hp Briggs & Stratton #80202, w/rewind starter, piston displacement 7.75 cu. in. (127cc), 3600 RPM no-load. Dual element air cleaner, manual governor control, and low-tone muffler.

**Clutch** . . . . Spring loaded belt tightener-type. Large 2 3/4" dia. backside idler w/sealed ball brg. for long belt life & automatic take-up for stretched or worn belt. Reel clutch control at operator station for convenience and safety.

**Chassis** . . . . Sides 12 ga. sheet steel, deck 14 ga. sheet steel, welded construction. Internal box section stripper plate reduces recirculation and stiffens chassis.

**Drive** . . . . 4L-section belt from engine to reel. Sheaves, 3" O.D. at engine, 4" O.D. at reel.

**Axle** . . . . 1/2" dia. rod held in movable relationship to chassis by adjusting levers.

**Reduction** . . . . Engine to reel 1.33:1.

**Wheels** . . . . (4) 8 x 1.75 smooth tread semi-pneumatic tires, w/ball brgs. and lube fittings. Front wheels individually adjustable in 1/4" increments through 3" range by walking action of adjusting levers. Rear wheels bolted to chassis (two locations available).

**Wheel Base** . . . . . 15 3/4" at level position.

**Reel Speed** . . . . . 2700 RPM. Flail tip speed 5390 FPM.

**Reel Support** . . . . . Spherical O.D. sealed ball bearings mounted in 2-bolt flanges.

**Blades** . . . . Flail blades made from 1/8" high carbon steel and hardened. Have carbide hard facing along lower edge. Effective flail reel O.D. 7 7/8".

**Handlebar** . . . . 7/8" x 18 ga. zinc plated tubing. Handle folds down for convenient low clearance loading.

**Rear Shield** . . . . Flexible shield prevents objects from being thrown at operator. Flexes to rear to allow debris to escape.

**Cutting Width** . . . . . 15".

**Cutting Depth** . . . . . Reel adjustable from 5/8" above ground to ground level.

**Net Weight** . . . . . 75 lbs. w/flail reel.

**Dimensions** . . . . Width—21 3/4"; height (folded 23 1/2"), (working 40"); length (folded 32 1/2"), (working 51").



## MATAWAY

The Ryan Mataway is the heavy-duty power rake that dethatches and deep-slices large turf areas fast. Its powerful 10-hp engine, coupled with an extra-wide 19" swath, lets you cover about 10,000 square feet per hour.

The Mataway is designed to deliver the professional results you need. Snap-out reels let you easily select the type of blade and blade spacing required. A micro-screw adjustment assures precise slicing depth. Reverse reel (upmilling) provides a cleanly cut groove.

Self-propelled with handlebar control make the Mataway as convenient as it is efficient.

### MATAWAY SPECIFICATIONS MODEL 544283

Width	19" swath, 34½" overall.
Reel	Easy-change, snap-out reels.* Reverse reel direction.
Blades	Carbide tipped, 1/16" straight blades on 1½" spacing standard.
Depth of Cut	Micrometer screw adjustment for any desired depth within 1½" range.
Engine	4-cycle, 10-hp.
Controls	4 on handlebar.
Drive	Front wheel by gear box and roller chain, triple V-belts, engine to reel.
Clutch	Belt tightener.
Tires	Fully pneumatic—4.10/3.50-4.
Lubrication	Oil splash in gear case—pressure grease fittings.
Weight	320 lbs. (with 544265 reel).
Optional Equipment	1/32" and 1/8" thick blades available. Blade spacers for increasing spacing in increments of 1/8" from minimum spacing of 1/2". Flail blade reel.

\*Patent No. 3,439,747





## REN-O-THIN® III

With the 5-hp Ryan Ren-O-Thin III power rake and optional 6-bushel capacity catcher attachment, you can dethatch and catch in one operation. In addition, the Ren-O-Thin's floating axle follows land contours and the micro-screw height adjustment allows you to obtain precise dethatching depths.

A special S-shaped trailing shield deflects debris downward away from the operator when the catcher is not used. And three interchangeable reels are available for varying turf conditions.

### REN-O-THIN III SPECIFICATIONS MODEL 544837

<b>Width</b> .....	29 1/8"
<b>Height</b> .....	35 3/8" at handlebar.
<b>Length</b> .....	53 3/8" to front handlebar.
<b>Net Weight</b> .....	109 lbs. less reel.
<b>Engine</b> .....	5 hp, 4-cycle with rewind starter.
<b>Wheels</b> .....	Rear: Individually adjustable; Front: Micro-screw adjustment with lockable, floating wheels to follow land contours.
<b>Clutch</b> .....	Spring loaded belt tightener-type. Spring assures automatic takeup of belt slack.
<b>Tires</b> .....	4 semi-pneumatic, smooth tread tires. Front: 8 x 1.75; Rear: 10 x 2.75.
<b>Drive</b> .....	4L- section V-belt from engine to reel.
<b>Chassis</b> .....	Formed steel, welded construction. Debris baffle minimizes recirculation, conserves power, makes catcher attachment feasible.
<b>Blades</b> .....	Hardened, high carbon steel with carbide edges. Thicknesses: 1/32", 1/16", 1/8", fixed straight, 1/8" flail.
<b>Cutting width</b> .....	18"
<b>Cutting depth</b> .....	Reel adjustable from 1" above ground to 7/8" into ground.
<b>Reel speed</b> .....	2,700 rpm.
<b>Optional equipment</b> .....	Easy-to-change reels: Flail-type, 1/8" carbide-faced blades at 1" spacing. 1/16" fixed-type at 1 1/2" spacing. 1/32" fixed-type at 3/4" spacing and 1/8" fixed-type at 2" spacing. Wheel Scraper Kit. Catcher assembly.

## REN-O-THIN® IV

The 7-hp Ryan Ren-O-Thin IV is designed for professionals, as well as homeowners. It's a power rake that can be used for breaking up cores, or dethatching on greens, tees and lawns.

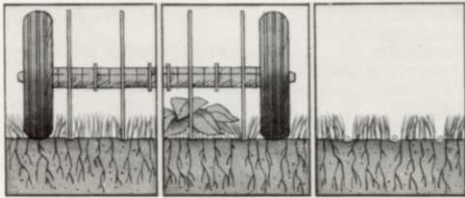
It's a power rake that boasts a 4L-section V-belt drive and ball-bearing wheels, and a unique chassis baffle that minimizes recirculation.

In addition, Ren-O-Thin IV has a floating front axle with a micro-screw height adjustment. A spring-loaded reel clutch control on the handlebar. And an S-shaped trailing shield. Making this quality built power rake perfect for your dethatching needs!

The Ryan Ren-O-Thin IV . . . proven performance on the job.

### REN-O-THIN IV SPECIFICATIONS MODEL 544838

Width	29 1/8"
Height	35 3/8" at handlebar.
Length	53 3/8" front to handlebar.
Net Weight	126 lbs. less reel.
Engine	7 hp, 4-cycle with rewind starter.
Wheels	Rear: Individually adjustable; Front: Micro-screw adjustment with lockable, floating wheels to follow land contours.
Clutch	Spring loaded belt tightener-type. Spring assures automatic takeup of belt slack.
Tires	4 semi-pneumatic, smooth tread tires. Front: 8 x 1.75; Rear: 10 x 2.75.
Drive	Dual 4L-section V-belt from engine to reel.
Chassis	Formed steel, welded construction. Debris baffle minimizes recirculation, conserves power, makes catcher attachment feasible.
Blades	Hardened, high carbon steel with carbide edges. Thicknesses: 1/32", 1/16", 1/8", fixed straight, 1/8" flail.
Cutting width	18"
Cutting depth	Reel adjustable from 1" above ground to 7/8" into ground.
Reel speed	2,700 rpm.
Optional Equipment	Easy-to-change reels: flail-type—F, 1/8" carbide-faced blades at 1" spacing. 1/16" fixed-type at 1 1/2" spacing. 1/32" fixed-type at 3/4" and 1/8" fixed-type at 2" spacing. Wheel Scraper Kit. Catcher assembly.
Feature	Reversible handle for upmilling.



*Thins running stem grasses.*

*Cuts out low-growing weeds.*

*Tiny slits catch seed, minimizes water runoff, fertilizer washes into soil.*



# SOD CUTTING

Today, Ryan makes small, powered sod cutters that can cut up to 135 feet of sod per minute. Machines that allow small or large users to take advantage of the benefits of sodding versus seeding.

Ryan also makes larger, more powerful sod cutters that not only cut up to 187 feet of sod per minute, but cut it into strips and roll it automatically. These field-proven cutters can be operated almost continually, even under wet soil conditions.

## HEAVY-DUTY SOD CUTTER

The Ryan Heavy-Duty Sod Cutter is rugged, dependable and a quality built piece of equipment for professional use. The eccentric is driven by heavy-duty spur gears. One man can cut up to 187 feet per minute in high gear. And the cutoff model offers automatic vertical cutoff adjustable from 1 to 9 feet.

In addition, it has a sound reputation for getting the job done; built on years of actual in-the-field use.

### HEAVY-DUTY SOD CUTTER SPECIFICATIONS

CUT WIDTH	NET WEIGHT	SPECIAL EQUIPMENT	SOD CUTTING METHOD
12"	391	—	Walkbehind
12"	481	Auto Cutoff	Walkbehind
16"	436	—	Walkbehind
16"	522	Auto Cutoff	Walkbehind
16"	743	Auto Cutoff	Sulky Roller
18"	446	—	Walkbehind
18"	551	Auto Cutoff	Walkbehind
18"	748	Auto Cutoff	Sulky Roller

**Engine** ..... 12-hp w/recoil starter.  
**Ground Speed** ..... 135 to 187 ft. per minute highgear.  
 121 to 150 ft. per minute lowgear.

**Cutting Thickness** ..... Up to 2½", lever controlled.

**Engine Clutch** ..... Belt tightener-type.

**Drive** ..... Two A-section V-belts engine to gearcase. Gears and roller chain to drive wheels; gears to blade eccentric shaft. All gears heat treated. Two forward speed transmission has dog clutch to disengage blade.

**Lubrication** ..... Oil splash in gearcase. Pressure grease fitting elsewhere.

**Drive Wheels** ..... 2 wheels, 8" diameter with knobby tread rubber tires vulcanized to hubs.

**Rear Wheels** ..... 8x2.50 tires with sealed roller bearings.

**Auto Cutoff** ..... Roller chain drive, friction disc clutch and brake, sod strip length adjustable from 1 to 9 ft.

### SULKY ROLLER ATTACHMENT

**Wheels** ..... 4.80/4.00-8 pneumatic tires with roller bearings.

**Hitch** ..... ½" diameter pin.

**Rolling Rack** ..... Springloaded, adjustable for sod of various lengths 6' to 9'.



## JR. SOD CUTTER

The Jr. Sod Cutter is the original Ryan sod cutter. It has been proving itself for years, wherever small sod-cutting jobs are required.

The Jr. Sod Cutter gets its muscle from a proven 7-hp engine that lets one man cut up to 135 feet per minute, up to 2-1/2 inches deep, in 12- or 18-inch swaths.

The Jr. Sod Cutter is engineered to last too, with its heavy-duty gearbox and overall rugged construction. For loading and transporting convenience, an optional tote trailer is available.

### JR. SOD CUTTER SPECIFICATIONS MODELS 544844, 544845

**Width of Cut** ..... 12" Model and 18" Model.  
**Ground Speed** ..... Variable with engine speed up to 135 ft. per minute.  
**Thickness of Cut** ..... Up to 2½".  
**Engine (Recoil Start)** ..... 4-cycle, 7 hp.  
**Drive** ..... A-section V-belt, engine to gear case. Double roller chain to blade eccentric shaft; gears and roller chain to traction wheels. Transmission has separate dog clutches to disengage cutting blade and traction drive.  
**Engine Clutch** ..... Belt tightener-type.  
**Drive Wheels** ..... Two 8" diameter knobby tread rubber tires vulcanized to cast iron hubs.  
**Lubrication** ..... Oil splash in gear case. Pressure grease fitting elsewhere.  
**Weight** ..... 12" model, 294 lbs. 18" model, 338 lbs.  
**Blade Pitch and Depth Controls** ..... Hand lever adjustments.  
**Optional Equipment** ..... Blades for aerating, trenching, and laying flexible pipe or line. Tote trailer.

## TOTE TRAILER

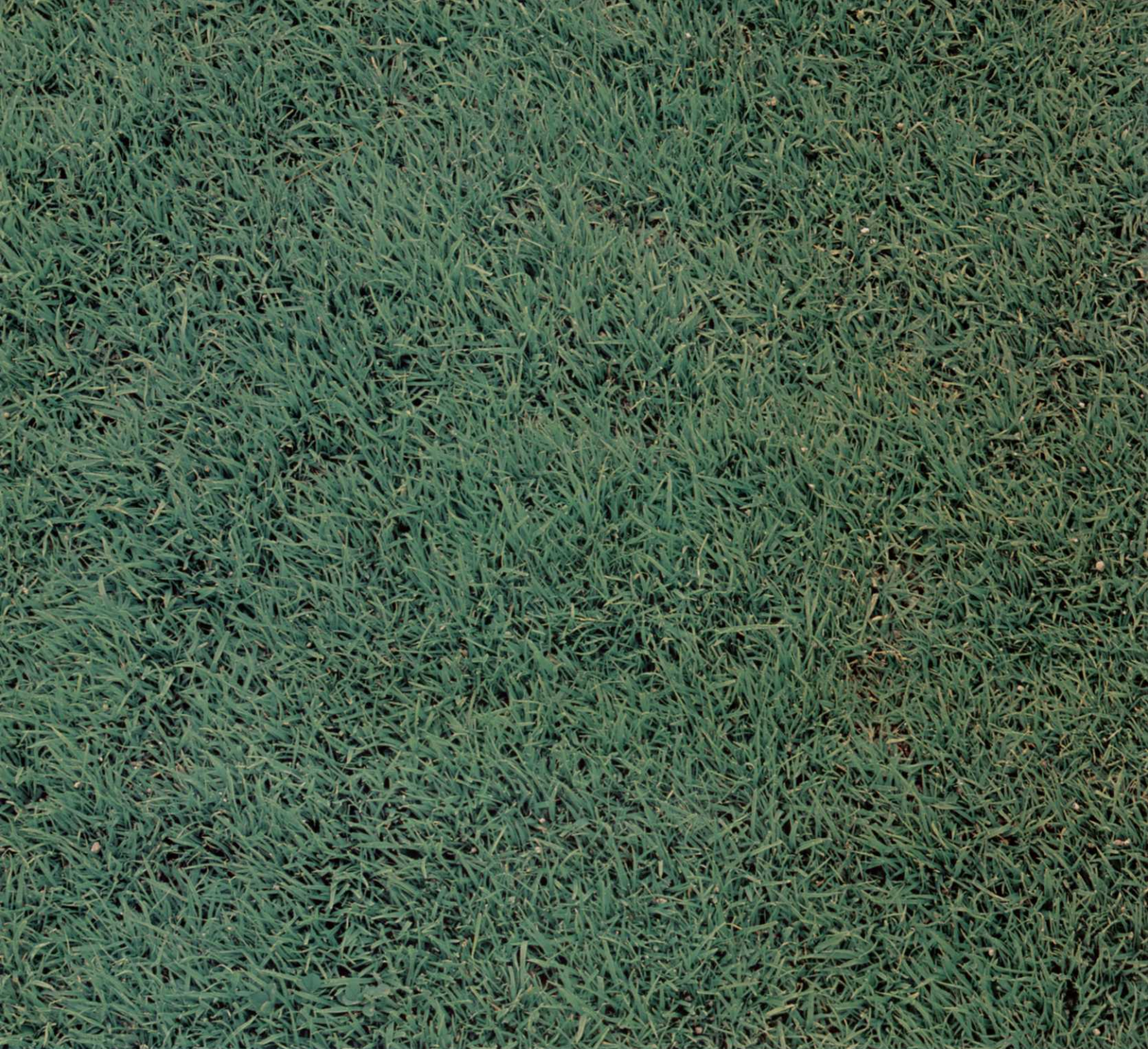
The Ryan Tote Trailer is designed specifically for the Jr. Sod Cutter. The Tote Trailer can help you save money by saving time and reducing manhour costs through loading and transportation.

Standard equipment includes fenders and lights.

### TOTE TRAILER SPECIFICATIONS MODEL 544856

**Length** ..... 72".  
**Width** ..... 56".  
**Wheels** ..... 2 pneumatic 4.80/4.00 x 8", 2-ply tires on steel rims with tapered roller bearings.  
**Hitch** ..... Heavy-duty cast steel coupling, fits 1½" or 2½" ball—includes safety chain.  
**Weight** ..... 135 pounds.





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# Elizabeth Arden Golf Classic

By IRENE JONES

The \$100,000 L.P.G.A. Elizabeth Arden Classic was held on C.C. Aventura's South Course February 15 - 18 with 104 of the world's finest women golfers participating. Great names from the tour included recently named 1978 Rookie of the Year, 1978 Player of the Year and number one money winner of 1978 Nancy Lopez; number two on the money list Pat Bradley and number three Jane Blalock.

Geographically the tournament was ideally situated this year. Aventura sits right on the county line between Dade and Broward. The gallery turn out proved to be the largest ever to attend an L.P.G.A. event in South Florida; with all proceeds going to the benefit of the American Cancer Society.

Mother Nature proved to be a true lady . . . if we could have ordered the ideal weather for each day we could not have had it finer. Temperatures ranged from the low 60's at night to the high 70's during the day.

According to Tournament Director John Montgomery Jr., "The overseeded bent grass greens were terrific, the rough was tough, and the over all course was in meticulous condition."

Victory came as Amy Alcott watched her 25-foot birdie putt sink on the third sudden death playoff hole. She beat Sandra Post and claimed the \$15,000. first prize. This brings her tournament wins up to six. Both Post and Alcott finished regulation play with one-over-par 73s and 72 hole totals of 213. Tied for third at an even 216 were Pat Bradley and Jan Stephenson.



Amy Alcott walks up to green #18 enroute to first victory of the 1979 LPGA Tour.

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Dan Jones, CGCS receives The Leo Fesser Award from President George Clever for the best article in "The Golf Superintendent" during 1978

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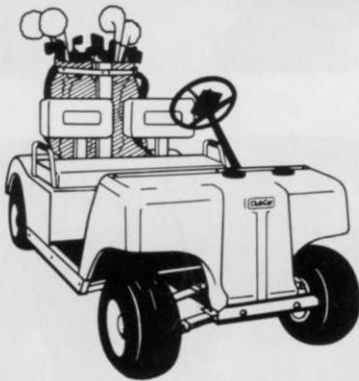
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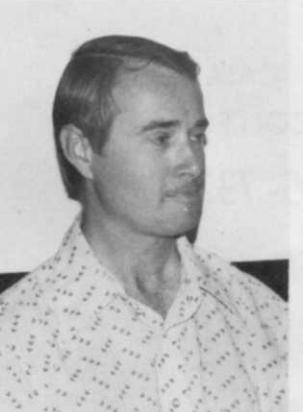
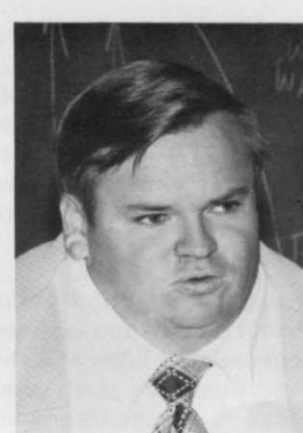
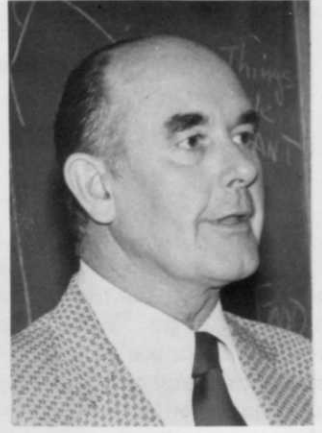
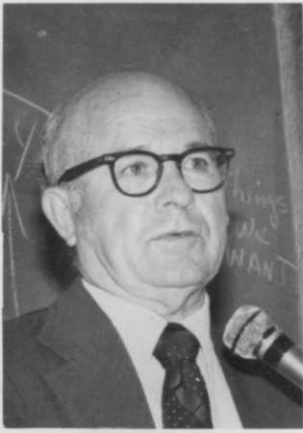
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**Photographic report on these two pages by Harry McCartha.**





Top row left to right:  
 Dr. W. B. Ennis, Jr. Director, A.E.  
 Dudeck, E. O. Burt, L. E. Watson.  
 Second row: W. J. Carpenter, L. J.  
 Daigle, R. B. Whitty, H. G. Myers.  
 Third row: R. A. Atilano, R. H.  
 Zerba, G. W. Swan, P. Busey.  
 Bottom row: G. H. Snyder, C. A.  
 Lowrey, Jim Reinert.

# EFFLUENT — New Water Style

By ROBERT L. SANDERS, C.G.C.S.

The superintendent stood at the golden gate. His head was bent low. He merely asked the man of fate which way he ought to go. "What have you done," St. Peter said, "to seek admittance here?" "I maintained a Country Club on earth for many and many a year." St. Peter opened wide the gate and gently pressed the bell. "Come in," he said, "and choose your harp — you've had your share of hell."

And now we are talking about having to use "dirty water", "once used water", "effluent water", or "reclaimed water". How many of you today use reclaimed water? How many would like to use effluent water? There may come a time when we, as superintendents will have no choice. Recycling appears to be our key to survival. Recycling of many of our resources is here to stay. And it is correct!

There is absolutely no reason we have to have fresh water pumped out of the ground to water our turf while millions of gallons of "once used" water is wasted and allowed to run down dry washes, into rivers or into our lakes. First we must recycle in order not to use up our water resources. Second, federal laws will soon make it more and more difficult to simply waste effluent. And third, public opinion as to ground water pumping may cause the use of effluent and this could happen to you.

In early 1976 the city of Tucson, had plans to construct a Robert Trent Jones course. The drawings were complete, land was purchased and the construction contract was signed. Public opinion caused the mayor and council to stop construction the day it started. The reason was water — the use of one million gallons per day of fresh pumped ground water and it cost the city of Tucson \$250,000 not to build the course.

To my knowledge, golf courses are the only legal use of effluent at this time. All this talk about effluent and we have not determined exactly what effluent really is. Effluent is the liquid that comes out of a sewage treatment plant after completion of the treatment process. A sewage treatment

plant is basically a big water cleaning machine. It consists of a series of tanks, screens, filters and other devices to separate out the wastes in sewer water.

As raw sewage enters a plant for treatment, it flows through screens which remove large objects such as rags, rocks and sticks. Then the sewage passes through a huge grinder. Next it passes through a grit chamber where sand, grit and small objects are allowed to settle to the bottom. Some suspended solids also settle out here. After the grit and etc. are removed, the sewage still contains large amounts of dissolved organic and inorganic matter as well as suspended matter. At this point the speed of flow is reduced and more suspended solids sink to the bottom of the tank. This mass of solids is called raw sludge. Now remember raw sludge and how we got it because we are coming back to it later. This sludge is removed from the tank for further treatment (as with milorganite) or disposal. This is as far as some plants treat sewage and the liquid remaining is pumped for turf.

If secondary treatment is to be, there are two main methods of treatment: 1. the trickling filter process and, 2. the activated sludge process. The trickling filter is a bed of stones from three to ten feet deep over which sewage is sprayed so it can trickle down through the layers of rock. Bacteria from the sewage collects on the rocks and consumes most of the organic matter in the sewage. The cleaned water flows out through pipes at the bottom of the filter and is treated with chlorine to kill the remaining bacteria. This water is now discharged from the plant and can be utilized for plants. The activated sludge speeds up the work of the bacteria in sewage by mixing sewage, recycled sludge (full of bacteria) and huge amounts of air. The sludge with its load of bacteria is mixed with the sewage and air. The bacteria then consumes the organic matter in the mixture as it sits for several hours. Then the mixture flows to another tank where the solids are allowed to settle to the bottom. The cleaned water is chlorinated and discharged. Some sludge is activated with additional

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bacteria and returned to be mixed with more air and more sewage. Proper chlorination of this treated waste water will kill more than 99% of the harmful bacteria in the effluent. — Remember I said *bacteria*. The secret to this process is a super saturation of bacteria and air.

Lets discuss the terms associated with waste water.

**Sludge** — the solid matter that settles to the bottom, floats or becomes suspended in the sedimentation tanks and must be disposed of by filtration and incineration or by transport to appropriate disposal sites.

**Primary Treatment** — the stage in basic treatment that removes the material that floats or will settle in sewage. It is accomplished by using screens to catch the floating objects and tanks for heavy matter to settle in.

**Secondary Treatment** — second step in which bacteria consumes the organic part of the wastes. It is accomplished by bringing the sewage and bacteria together in the trickling filters or in the activated sludge process.

**Suspended Solids** — small particles of solid pollutants which are present in sewage and which resists separation from the water by conventional means.

Now lets get down to the “brass tacks” or basics. What is the effluent or “once used” water really like? First it is an excellent media for growth — a beautiful liquid fertilizer. The water I was working with contains 7.3 pounds of actual N per 1000 sq. ft. per year. This N was 8.1 ppm organic or slow release and 17.5 ppm inorganic or that N that may be taken up faster. Phosphate equals 30 ppm. Potassium equals 104 ppm. Also the water contains sodium, calcium,

magnesium, iron, zinc, sulfur, boron, copper and molybdenum. Ph is 7.7. Great stuff — all required elements. Good Ph — Perfect! However there are a few problems:

**Salts** — May be high — as much as 1000 - 2000 ppm. — be careful — test your water — test your soil — know what is going on. Remember: less than 650 ppm salt useful, 650 -2000 ppm must use periodic leaching, more than 2000 ppm limited usefulness. Also remember least tolerant grasses: Highland, Colonial Bent, Kentucky Bluegrass. Of seven creeping Bents — top growth slowed as salt increased. Arlington, Seaside, Pennlu, Old Orchard — most tolerant. Congressional and Cohansey intermediate. Penncross least tolerant. Also having medium tolerance is perennial rye, tall fiscue and orchard grass. Most tolerant are all the bermudas.

**Sodium** — may be high — ours was 104 ppm — continuous use of effluent may allow Na to clog clay particles — decrease drainage and could be fatal to some soils. Seaside found to be most tolerant to alkali conditions.

**Heavy Metals** — these cannot as yet be removed in territory treated water. These may collect in some soils and cause problems. However, this is more a problem in highly industrial areas. Also our calcareous soils precipitate out some of these therefore causing us a small problem, however, these metals end up somewhere in our world.

Last and by far the most apparent and troublesome is algae growth. Our water fresh out of the plant looked like tap water. Of course if you drink it, you are going to be very busy for awhile for it actually would be a “dose of salts”. As

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soon as this water is exposed to sunlight we have a tremendous bloom of algae. I have seen it 6 - 8 inches thick floating on the surface. It clogs valves and sprinklers. It smells and feels greasy. It dies and floats to the surface as a dark brown heavy froth and it was mine, and it will be your job to convince your employees and players that it is algae and not something else. However everything is not what it might appear to be and that reminds me of a story. — Chicken hawk story - Lark, Dove, Duck-(Drake).

This brings up another problem and that is people. People and their opinions. Many feel effluent is dirty. Course employees don't like to work in it. Players are very sensitive to getting water on their clothes. There may also be problems with uninformed people drinking out of sprinklers and we already know where he is going to spend some time. Seriously, those working with effluent should keep up on all immunizations because as we said before, chlorine kills bacteria, it does not to my knowledge kill virus. Nothing that is available today kills all virus. If we could discover this procedure, I am sure we would have the cure for the common cold.

Effluent is here to stay; It should be used!

California law AB 1784 (papan regulation) Section 13550 of California's western code makes it illegal to use fresh water on a golf course if effluent is reasonably available. Now convince me, we as superintendents are not going to have to live with it and learn about it. Some solutions to our

problems have been: Dual water systems may be necessary for greens — one system effluent and one system fresh water to be used to leach out salts, sodium (after calcium applications) and heavy metals. Leaching rule: 6 inches water to remove 1/2 salts in 1 foot soil — 24 inches water to remove 9/10 salts in 1 foot soil.

**Algae** — Do not allow the effluent to stand in the sun. Allow no exposure to the sun. Take the water out of the plant straight into the irrigation system or into a closed tank. Also add strainers or sand separators to the system as insurance. Use "dirty water" irrigation parts. There are some available on the market.

Another aspect is education. The people associated with the course must be educated. They must be convinced on the use of effluent. Remind them that grass purifies. 60% of the water used returns to the environment pure. An 18-hole golf course, if watered 1 inch can absorb four million gallons of water. Remind them that grass produces oxygen. One acre produces enough pure O<sup>2</sup> for four people for one year. And 18-hole golf course produces enough for the life support of 1,000,000 people and it is clean and pure.

Then after all this you might want to write a letter to Santa Claus expressing your desires. Maybe it should go something like this:

Dear Santa Claus:

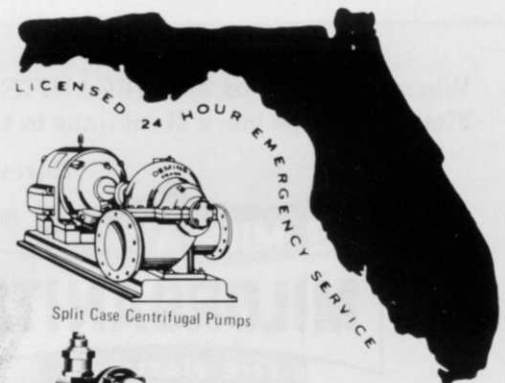
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and tear, disease, bugs, unreasonable players and other pests. Please leave at Tom Smith's house: one durable soft rubber putter which may be cast violently on the ground without injuring the turf on my greens. Please leave at Ed Jones's house one digging fork and a spade in order that he may have something to dig with in his back yard to satisfy his craving for digging and thus relieve the strain on our tees. Please leave some message of inspiration with the Royal and Ancient and the USGA which will encourage them to adopt a new cup with a diameter of at least ten feet so that in the future it may be feasible, if there are any missed putts, to blame them on the player rather than on the superintendent. Please leave your message of good will firmly fixed in the haughty hearts of our members and make it last at least for many months and make it possible for the superintendent to actually enjoy his work within a month after he found it necessary to close the course for a single day.

If you will do all this dear Santa, you need not visit my house. We'll take care of the kids this year.

Humbly yours,  
The Superintendent

Thank-You

**Editor's Note:**

Bob Sanders, CGCS is the Golf Course Superintendent at the Skyline Country Club, Tucson, Arizona.

Our thanks to Bob and the other fine people who keep sending us first rate articles to keep "The South Florida Green" No. 1 in Turf Publications.

We try to print only first run articles and we welcome any topic that a turf related person would like to share with our readers.



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# Florida Greenkeeping

By LYMAN CARRIER

**EDITOR'S NOTE:** This article reprinted from the October 1927 edition of "The National Greenkeeper" is believed to be the first article ever written about a Florida golf course. We thank the G.C.S.A. for permission to reprint this article.

**Editor's Note:**—Mr. Carrier was for many years connected with the U. S. Department of Agriculture, as agronomist in pasture and forage crop investigations. His work with the U. S. G. A. Green Section established the value of vegetative creeping bent for putting greens.

**M**OST Florida golf courses appear neglected in summer. Golf there has in the past been considered a winter pastime. The courses have been built largely to meet the demand of the northern tourists who sojourn there for a few winter months. When the tourist season is over in the spring maintenance operations are cut to a minimum or cease altogether. The finer grasses languish and die out. Crab grass, Bermuda and a few weeds make a struggle for existence. In the fall there are hurried preparations to put the course again in condition for play. The greens are cut and raked and reseeded to redtop, rye grass or something similar. Greenkeeping under such conditions lacks something which the northern greenkeeper enjoys—there is not the satisfaction of creating a permanently beautiful scene.

There are lots of people who live in Florida the whole year and the play on some of the public golf courses where an attempt has been made to keep up playable conditions prove that the game is as popular there in summer as it is in the North. Some greenkeepers in Florida, however, seem to have the idea that the period of summer neglect is a necessary feature of golf course maintenance.

## *Black Muck for Top Dressing*

Ray Tower of the Forest Hills Golf Course, an excellent course located near Tampa, does not subscribe

done that way for years and many think it is the only way it can be done successfully. Tower had had experience with vegetative planting and could see no reason why the stolons could not be cut into short pieces and planted broadcast the same as is done with creeping bent. He finally persuaded those in charge to let him put in a green by his method. The result was a decided saving in labor and the ground was completely covered with turf in a much shorter length of time.

Ray Tower is a firm believer in the liberal use of fertilizers under Florida conditions and it is difficult to see how good turf can be produced otherwise on thin sandy land. The Florida greenkeepers have much more freedom in the choice of fertilizing materials than have those in the North.

In the North where the bent grasses predominate for putting green purposes it has been proved to be advisable to keep the soil in an acid condition. To do this only such fertilizers should be used as do not leave an alkaline residue in the soil. This necessitates cutting out such common materials as nitrate of soda, acid phosphate,

to this theory. When I visited his layout late in June he had the best summer turf on his putting greens I ever saw in Florida. He was giving them the same care as is customary to give greens during the season of heaviest play. The Forest Hills Course was designed and built under the direction of J. Franklin Meehan, the well known golf architect and landscape artist of Philadelphia. Construction was started in January, 1926 and the course was ready for play the following October. The soil at Forest Hills is sand the same as is the case on nearly all of the Florida courses. During the construction the putting greens were given a covering of five inches of black muck from the bed of an old pond. Mr. Tower considers this top soil of muck over the sand as highly important in the matter of production of all-the-year-round turf in Florida. It keeps the loose sand from shifting, holds moisture, and as it is composed mostly of organic matter it furnishes more plant food to the grass than will the natural soil of the region.

## *Planting Bermuda by New Method*

The greens were planted with Bermuda grass by the vegetative method. It is customary in the South to plant the Bermuda stolons in shallow trenches. It has been

bone meal, and potash, leaving ammonium sulphate and ammonium phosphate as the only common commercial goods that are safe to use.

## *Bermuda Needs Plenty of Fertilizer*

With Bermuda grass this restriction does not apply. There is no danger of promoting the growth of clover in Florida by the use of an alkaline fertilizer and all that Bermuda asks for is a square meal and is not overly particular about what it is fed. A good fertilizer for turf should carry a high percentage of nitrogen, about half as much phosphoric acid as nitrogen and a small amount of potash.

Experiments with *Poa bulbosa*, the new winter bluegrass for the Southland, at Forest Hills gave very promising results. Although not planted until January it made sufficient growth so it was cut three times before it died down with the beginning of summer. If this is a sample of what is to be expected from this interesting little grass it may be suitable for use on the Bermuda greens instead of the redtop or rye grass to give the green turf during the winter.



Lyman Carrier

## Guest Editorial

# Open letter to Florida Golf Course Superintendents

By TIM HIERS



Tim Hiers

Florida has the second largest golf course industry in the nation, ranking only behind California. Recent growth and construction statistics indicate that within five years Florida may surpass California in total number of golf courses.

Yet when it comes to representation within the GCSAA the Sunshine state hovers near the bottom of the totem pole. Only one president of the GCSAA in the last 51 years has been from Florida and the board of directors representation fits in the same category. As a result of this past poor representation a great majority of research funds and national programs have not been directed toward problems concerning Florida's golf courses and their respective superintendents.

The state of Florida is not out to gain control of the GCSAA but merely to obtain equal representation and recognition. This situation cannot be fully corrected by Florida superintendents joining the GCSAA individually. In order for a meaningful and productive change to come about it is necessary for us to unify and support the GCSAA in the form of a strong and well-organized statewide association.

This can be accomplished without effecting the operation or identity of the individual local superintendents associations.

In essence the purpose of the Florida Golf Course Superintendents Association is to improve communications among the local associations and to form a strong unified group of associations that have common goals in mind. This will directly benefit the individual superintendent who is shackled with such imposing problems as the possible energy crisis, precious chemicals being taken off the market by the EPA, lack of communications and service between superintendents and their suppliers.

In October of 1978 the four presidents of the original Florida State Golf Course Superintendents Association met in Orlando to nominate and elect me as your statewide president. Since that time we have had two meetings. An attorney, Bob Hoffman, was hired to lay the groundwork for articles of incorporation and by-laws. At our first meeting on Dec. 8, 1978, in Orlando, several amendments were made to the original articles of incorporation. Included in these were Amendment 1, to change the name from Florida State Golf Course Superintendents Association to Florida Golf Course Superintendent's Association and Amendment 3, to include all existing associations and future associations in the FGCSA. The president of your association has a copy of the articles and amendments.

Due to the organization becoming inactive in 1973, we had to re-file through the state to become an active corporation. When these proceedings have been accomplished, the new articles of incorporation will be printed and distributed. At the December meeting we asked the presidents of the local associations to collect \$2 from each superintendent. Dr. Harry Meyers, professor from the University of Florida, was the first to contribute his \$2.

These limited funds have assisted in the reorganization of our association. In our last meeting at the Holiday Inn Central in Tampa March 8 we reviewed the amendments and laid groundwork for the future. Bill Wager was appointed head of the by-laws committee and hopefully they will be submitted and approved in our August 26 meeting in Melbourne.

On Monday Aug. 27 the third annual Crowfoot Open will be held at Suntree CC in Melbourne. Consult your local association and plan to attend this tournament as we hope to use this as our annual state meeting. We also hope for the possibility in the future of changing the South Florida Green to the Florida Golf Course Superintendents Ass'n magazine. In the eventual formulation of membership fees we hope to include a weekly subscription to Florida Golfweek to each superintendent as a tool for ongoing communication across the state. This could include articles on a weekly basis from local associations.

Some people may be quick to point out previous failures of the state association even though competent and hard-working people were involved. Unfortunately support they received, if any at all, from across the state was not unified. We believe that because of the growth of Florida, a better means of communication and more concerned individuals the Florida Golf Course Superintendents Association will be a useful tool and an outstanding success.

In closing I would like to emphasize that our association is not affiliated with Florida Turfgrass Association. The FTGA is simply interested in our future success and is willing to lend a helping hand. It is my hope that each superintendent across the state will extend his cooperation to his local association in their support of the statewide organization.

I want to personally thank Charley Stine, publisher of Golfweek, for contributing his time and interest in the progress of our association. He has agreed to provide a free subscription to each individual member until such time as the Florida Golf Superintendent's Association can incorporate a subscription into the membership fees. I request the president or secretary of each association to send Golfweek a mailing list of their respective members.

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