

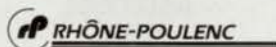
Recent studies show
Chipco® Ronstar® G works
without root pruning.
We say judge for yourself.

Let's face it, the last thing you need from a turf herbicide is root damage. That's why so many golf course superintendents are making CHIPCO® RONSTAR® brand G herbicide their first choice for broad-spectrum weed control. Root pull studies conducted at a leading university show that CHIPCO® RONSTAR® G herbicide works without pruning turf roots. That's important, because healthier roots mean stronger, more durable turf. Turf that stands up better to stress. Best of all, just one pre-emergence application of CHIPCO® RONSTAR® G provides season-long control of 25 tough broadleaf and grassy weeds—including goosegrass and crabgrass. You'll also appreciate the fact that CHIPCO®

RONSTAR® G won't leach out or move laterally through the soil. And it's labeled for use on a wide variety of ornamentals. So you can apply it to ornamental plantings at the same time you do your turf. You'll get up to 120 days of weed-free control. Plus CHIPCO® RONSTAR® is also available as a wettable powder and in granular fertilizer formulations under well known brand names. So judge for yourself. You'll discover why CHIPCO® RONSTAR® is the number one turf herbicide on the course today.



Chipco® Ronstar® G
Brand Herbicide



seen on television with a budget that is not large enough to deal with 45 acres of bentgrass fairways." The 1989 budget on his 18-hole private course is \$200,000, up from \$180,000 in 1988.

Several supers cited the lack of available monies to improve irrigation and meet the rising costs of equipment and personnel as a problem. Said one: "Working on a private membership course, it is hard to get the money needed to improve equipment and irrigation. They [owners] are satisfied with what they have and won't attempt to grow and improve."

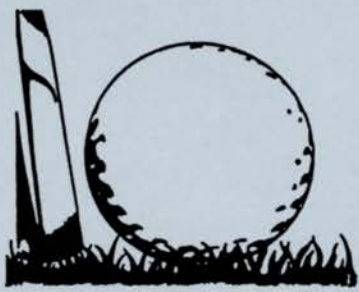
Budgets are growing

Though comparing golf course budgets is essentially a meaningless task, it is encouraging to note that survey results showed a steady increase in course budgets since 1987. At that time, supers reported working with budgets around \$255,000. In 1989, that range will fall in the area of \$335,000, up from \$297,000 in 1988.

And what will supers be doing with the extra dough? Many (68%) said they're planning on improving their irrigation systems. Not surpris-

Problem Diseases of Golf Turf

Dollar Spot	63%
Brown Patch	56%
Snow Mold	35%
Leaf Spot	38%
Pythium	54%
Others	17%



ing since 34% said they're using older quick-coupler or automatic systems with limited controls.

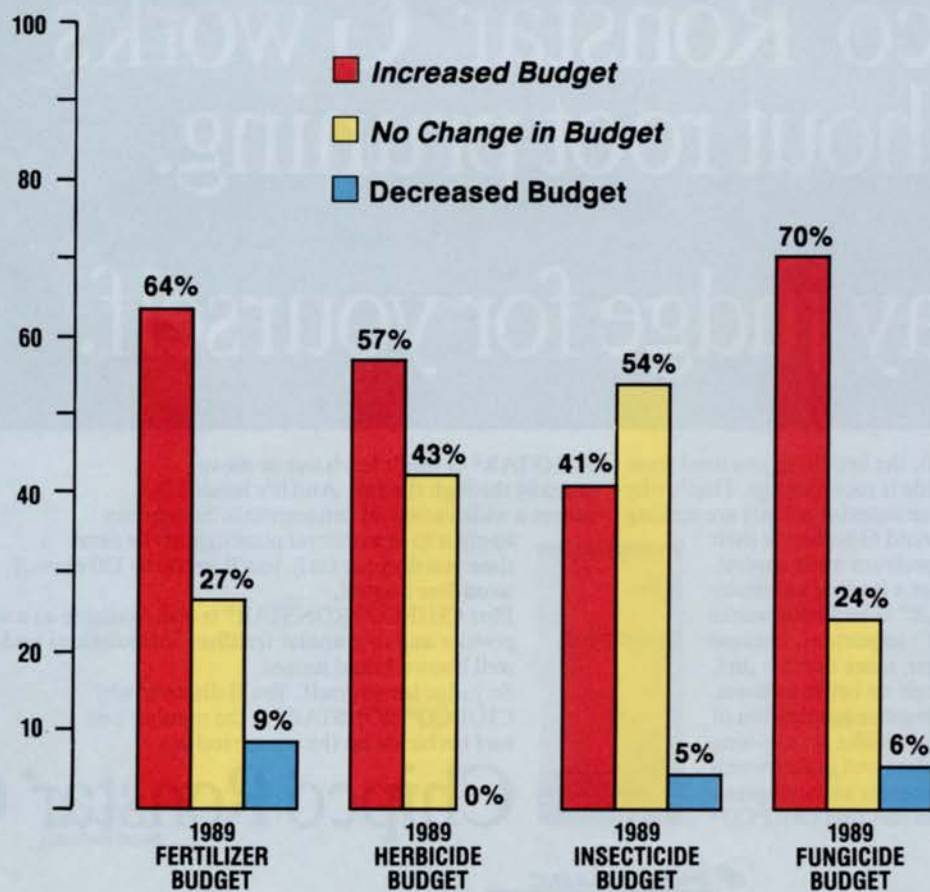
In general, supers reported their budgets for fertilizers, herbicides and fungicides have steadily increased in recent years, while insecticide budgets have grown at a slower clip. Sixty-four percent reported an increased fertilizer budget in 1989, compared to 28% who cited no increase. An anticipated increase in herbicide expenditures in 1989 was reported by 57% of the respondents and 69% said the same of their fungicide budget. Fifty-five percent reported no change in their anticipated 1989 expenditure for insecticides.

The major turf weed problems these supers face are dandelions (30%), crabgrass (30%) and clover (27%), which they fight with \$8,113 worth of herbicides. As far as insects are concerned, grubs were the major problem (33%), followed by sod webworms (17%) and armyworms (10%). Chinch bugs, mole crickets and nematodes were also cited as problem insects. The respondents reported an annual insecticide budget of \$4,915.

As for who supers will look toward when they're deciding where to spend that money? It appears they'll be looking at each other. When rating buying influences, nearly all of the responding supers rated other supers as either very important (49%) or important (46%) as a buying influence. Association information also ranked well, followed by distributor advice, magazine articles and extension agents.

There are a few noticeable trends that emerge when one pours over these survey results. One is that supers are being asked to do more than ever before. Their responsibilities are growing with the ranks of golfers. Also, the management of turf areas alone is no longer enough. The best supers need to be effective as a "people-manager", also. **LM**

1989 Budgets on the Rise



THIS MOWER CHANGED WALKING GREENSMOWER TECHNOLOGY FOREVER.

If you think advances in greensmower technology have leveled off, prepare to take off. The Bunton triplex is not only *new*, it's *better*. We started with fresh ideas and state-of-the-art technology and developed a truly well-engineered machine where every feature produces performance.



STARTING WITH FRESH IDEAS MEANT THE END TO COMPROMISES.

The Bunton triplex is light on its feet, yet heavy-duty in construction. Until now every greensmower ever built was a compromise designed to keep total machine weight down, to reduce turf compaction, at the expense of heavy-duty construction. Rather than striving to reduce total machine weight, our engineers concerned themselves with the pressure actually transferred to the surface. The result is more durable components that improve cutting performance. That means better greens surfaces... and for a longer time.

THE SOLUTION TO TRADITIONAL GREENSMOWER PROBLEMS.

We started by putting weight where it does some good. Our larger reel motors and counterweights sit solidly on the playing surface to eliminate bounce and produce a truer, more consistent cut. The unique traction wheel design allows more tire surface area to meet the green, to keep ground surface pressure low. Interchangeable parts keep inventories low and maintenance simple. Better performance results from a true hydrostatic transmission and dynamic braking, welded steel frame construction, extra oil filters, inde-

pendent reel operation, standard backlapping, and a powerful 18 hp Onan engine or optional 16.5 hp Kubota diesel.

And if that isn't enough, Bunton offers standard what others have as add-ons. With Bunton, what you demo, is what you get. And at a competitive price.

Call or write today for more information and a demonstration.



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History tells us throwing packages into the water can be a revolutionary idea.

Patriotic colonists really started something when they threw packages of tea into Boston Harbor back in 1773. Today, DURSBAN® 50W in water-soluble packaging is starting a new revolution in simple and convenient insecticide handling.

In handy 4-oz. packets that dissolve quickly and completely in water, DURSBAN 50W eliminates many problems which have been bugging lawn care operators for years.

- **No mess.** No dust to blow around.
- **No operator exposure.** The chemical stays in the packet.
- **No measuring.** Each pre-measured packet holds exactly 4 ounces; no chance for error.
- **No waste.** No accidental overuse... no skimping that can lead to costly callbacks.
- **No package disposal problems.** The

packet dissolves as you mix, and the fiber container goes in the trash.

Just convenience... and lasting efficacy. No turf insecticide controls a broader spectrum of surface-feeding insects than DURSBAN 50W. And because it's a wettable powder, it keeps working longer than emulsifiable concentrates... without their solvent odor. And DURSBAN 50W has an established human safety record.

Join the revolution. Throw over your old insecticide and switch to DURSBAN 50W. Eight 4-oz. water soluble packets in a childproof fiber container.

DURSBAN® 50W
TURF INSECTICIDE



*Trademark of
The Dow Chemical Company

Attention: Always read the label before use and carefully follow all label directions and precautions.

Circle No. 112 on Reader Inquiry Card

ROOM TO BREATHE

That's what aeration is all about. And to do it right, use hollow tines when the turf is active.

by Terry McIver, associate editor



Aerate cool season turf in early spring or early fall. Warm season grasses are best aerated in late spring.

Core aeration remains the best single cure for the respiratory ills caused by the triple threat of soil compaction, thatch and inter-facing soils.

Proper and timely aerification as-

sure that the turf completes the season in a healthy soil base and can breathe easier. The effectiveness of fertilizers and pesticides is upgraded, and overseeding into established lawns can be done without destroying

existing grass.

"Aeration of the soil is an exchange of gases between the ground and the atmosphere," says Paul Rieke, Ph.D. at Michigan State University. "It's also a practice of cultivation that helps to improve the root system.

"The goal of aerating is to create a better environment, a favorable growing medium for seed and established turf."

Impact on compaction

In soil containing shallow layers of compacted or incompatible soils, coring reopens a channel between soil layers, removes a portion of the problem soil and permits top dressing and refilling with more compatible material.

"Core aeration is the best way to improve the soil's oxygen diffusion rate," says Robert Morris, area specialist in commercial horticulture at the University of Nevada.

Morris explains that soil normally consists of micro and macro pores. Micro pores contain water; diffusion occurs in the macro pores. "But when soil is compacted," says Morris, "the

An analysis of solid tine aeration

Recent aeration research by Robert Carrow, Ph.D., University of Georgia, tends to support the belief that solid-tine coring is less effective as a turf cultivating procedure.

Carrow has been studying the effects different cultivation techniques have on surface compaction, root progression at varied depths and water extraction. Four aeration methods were studied: deep-drill coring, slicing, hollow-tine coring and shatter-core.

"Our soils in southern Georgia are high in clay content," explains Carrow. "Typically those soils are highly subject to surface compaction, and harden quickly when dry, making root progression difficult."

Carrow experimented on Tifway Bermudagrass, one of the most common grasses for use on recreational fields. Tifway is one of the most tolerant grasses when it comes to compaction, so Carrow believed the results would be very evident.

These were the general results:

In the 8- to 24-inch zone, the Aerway slicer enhanced rooting from 53 to 120 percent; the deep drill, 31 to 55 percent; hollow tine, 20-35 percent. The solid tines did not improve deep rooting within the 8- to 24-inch zone, but the solid tine sample tended to have higher roots in the 4- to 8-inch zone.

Carrow next tested for water extraction (how much

water the roots extract from the zone) during a dry-down period, from 0 to 24 inches.

"The deep drill, Aerway slicer and hollow tine aerator all improved water extraction, but the solid tine did not," says Carrow. We see the plant extracting more water from deeper in soil where there are more favorable water relations."

Carrow's findings should apply to a variety of turf. "Remember, our red clay soil has more than the usual amount of surface compaction."

—Terry McIver □



Robert Carrow: His research at the University of Georgia Tends to support the belief that solid-tine coring is less effective as a turf cultivating procedure.

Ryan brings quality aeration from golf greens to green lawns.



Introducing the new Ryan Lawnaire® 28.

The revolutionary Lawnaire 28 combines the technology and precision of golf course aeration with the demands of lawn maintenance. Its reciprocating, crank mounted tine arms feature a vertical coring action similar to larger Ryan aerators. Tines penetrate straight in to a depth of 2½ inches, and come straight out. The results are a more professional-looking job, better root development, greener lawns, and more satisfied customers.

Make more money by the yard.

Because time is money, the Lawnaire 28 is designed to cover big jobs quickly — up to 24,000 sq. ft. per hour. But because not every job is big, it's also compact and maneuverable. Just 34 inches wide, the Lawnaire 28 easily fits through yard gates. The unique tricycle front wheel gives the unit a zero turning radius while aerating!

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Circle No. 172 on Reader Inquiry Card

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macro pores are destroyed, and all that remains are water-laden micro pores. Since water is extremely dense, air takes approximately 100 times longer to diffuse through the micro pores. The more porous the soil, the greater the likelihood of a healthy root system."

When thatch attacks

Thatch accumulation presents a variety of cultivation problems. In addition to providing a home for insects, it becomes a temporary but poor growing medium for new seed, resulting

ultimately in a poorly rooted generation of new grass.

Combating soil interface

Interfacing occurs when soils with unlike physical properties collide, obstructing water flow.

Doug Chapman, horticulturist for Dow Gardens, Midland Mich., says interfacing also affects the depth of the root system, and indicates layering.

"An interface develops between either the native soil type, sandy ground and topdressing, or, if thatch is

present, between the ambient soil, thatch layer and top dressing material," explains Chapman, who presents a scenario in which one problem leads to another:

"Let's say you have thatch covered by a layer of sand. The thatch will have a broken column, and capillarity will not occur. All moisture and root growth stops at that layer.

"If you have sandy soil contrasted with richer soil, or if you top dress with complete soil, the roots might

CORING AERATORS

COMPANY AND PRODUCT MODEL	TINE TYPE	TINE DIMENSIONS/WIDTH IN INCHES	PENETRATION DEPTH IN INCHES	TINE SPACING IN INCHES	TYPE OF MACHINE (TOW OR WALK)	SPEED OF OPERATION	MACHINE WIDTH IN INCHES	WEIGHT IN LBS.	SUGG. RETAIL PRICE	COMMENTS
BRINLY-HARDY CO. CA-360	Spoon	6.25 x .93	2	6	Tow	2-6 MPH	41.75	84	185.00	
CLASSEN MFG. INC. Model 800-24	Open-closed	½ MIB, ¾ OD ¾ OD	03-¾	Variable 1 x 2 to 5 x 2	Tow	0-250 FPM	49	750	5925.00	
Model 450	Open-closed	¼, ¾, ½ & ¾	0-3	2 x 2	Walk	100 FPM	32	450	3900.00	
Model 500ATC	Open-closed	¾ OD	0-3	6 x 3	Walk	200 FPM	28½	310	2785.00	
Model 500	Open-closed	¾ OD	0-3	6 x 3	Walk	200 FPM	28½	300	2360.00	
Model 600	Open-closed	¾ OD	0-3	6 x 6	Walk	200 FPM	35½	300	2360.00	
Model 400	Open-closed	¾ OD	0-3	6 x 6	Walk	200 FPM	22½	250	1795.00	
Model 36R	Open-closed	¾ OD	0-3	4 x 7	Walk	225 FPM	28½	340	1550.00	
Model 48R	Open-closed	¾ OD	0-3	5¼ x 7	Tow	Tractor	42	225	995.00	
CUSHMAN - RYAN Lawnaire 28	Hollow	¾ x 4¼	2½	3½ x 5	Walk	24,000 FPH	34	400	3500.00	
Lawnaire IV	Hollow	¾ x 7½	0-22¾	3¾ x 7	Walk	21,000 FPH	28	215	1560.00	
Lawnaire 3 pt	Hollow	¾ x 7½	0-4	6 x 6	Tow	0-10 MPH	46	500	1270.00	
DEDOES IND. Model A Trailer	Hollow	¾, ½, ¾ dia.	2½-3½	2½ x 2½	Tow	0-10 MPH	60	600-800	5334.00	Available in 2-3 drum units
Model H	Hollow	¾, ½, ¾ dia.	2½-3½	2½ x 2½ 4 x 4	3 Pt. Tow	0-10 MPH	72	500	3321.00	Available in 2-3 drum units
Model B Trailer	Hollow	¾, ½, ¾ dia.	2½-3½	2½ x 2½ 4 x 4	Tow	0-8 MPH	57	400	3067.00	Available in 2, 3, 4 drum units
Model L Disk	Hollow; Taper/open	¾ x 3	3	6 x 6	Tow	0-10 MPH	72	410	2339.00	Available in 5-7 disk units
Model K Disk	Hollow	¾ x 3	3	6 x 6	3 Pt. Tow	0-10 MPH	42	320	1954.00	Available in 5-7 disk units

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The 17th Hole, Butler Country Club, Butler, PA

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not grow well, and you may have to water more frequently. If it happens to be a thatch interface, it might dry out and then you have to re-wet it. If it gets completely dry, you can't re-wet it without a detergent or surfactant or other wetting agent."

Aerate when it's active

Experts agree that aeration must be practiced only when the turf is active and able to bounce back from treatment.

Carrow at Georgia suggests that commercial turf might require more attention after coring.

"If you aerify too soon," warns Chapman, "the root systems are disturbed, and fill-in may not occur.

"If you core in early spring and don't have strong grass or turf activity, it won't start filling in until after weed season starts, which by then is too late."

"The question of when to aerate is related to the spring root die-back phenomenon," says Robert Shearman, Ph.D. at the University of Nebraska.

"When the plant initiates top

CORING AERATORS

COMPANY AND PRODUCT MODEL	TINE TYPE	TINE DIMENSIONS/WIDTH IN INCHES	PENETRATION DEPTH IN INCHES	TINE SPACING IN INCHES	TYPE OF MACHINE (TOW OR WALK)	SPEED OF OPERATION	MACHINE WIDTH IN INCHES	WEIGHT IN LBS.	SUGG. RETAIL PRICE	COMMENTS
JOHN DEERE CO.										
Model 270	Open-closed	½ x 8½; ¾ x 8½	1¼	5½ x 4	3 Pt. Tow	7.5 MPH	74	680	2872.00	
Model 132	Open-closed	½ x 8½; ¾ x 8½	1¼	5½ x 4	Tow	7.5 MPH	34.5	540	1543.00	
Model 232	Open-closed	½ x 8½; ¾ x 8½	1¼	5½ x 4	3 Pt. Tow	7.5 MPH	34¼	500	1212.00	
FELDMANN ENGINEERING CO., INC.										
2340-48	Spoons	4¾ x ¾	2½	9 holes per sq. ft.	Tow	Varies	48	118	409.50	
2340-32	Spoons	4¾ x ¾	2½	9 holes per sq. ft.	Tow	Varies	32	85	309.50	
GANDY CO.	Welded spikes	2½ dia.	1¼	6 Ctr	Hitch	N/A	24	350	N/A	
GREEN CARE INT'L.										
CoreMaster 12	Hollow	¼, ½, ¾, ¾	0-3¼	1 x 1¼, 1 x 2, 2 x 1, 2 x 2, 2 x 3, 2 x 5	Tow	Up to 30,000 FPH	48	800	8495.00	
HAHN, INC.										
TMV	Open-closed	8½ x ¾	9-3½	5 x 7	Ride	0-4½ MPH	33	700	4300.00	
TB-140	Open-closed	8½ x 1	0-3½	5 x 7	Tow	0-10 MPH	90	954	3970.00	
TM-140	Open-closed	8½ x 1	0-3½	5 x 7	Tow	0-10 MPH	74	675	2995.00	
TB-60	Open-closed	8½ x 1	0-3½	5 x 7	Tow	0-10 MPH	34	550	1645.00	
TM-60	Open-closed	8½ x 1	0-3½	5 x 7	Tow	0-10 MPH	34	500	1310.00	
EA-3	Open	7 x ½	0-3	5 x 7	Walk	0-3 MPH	25	166	895.00	