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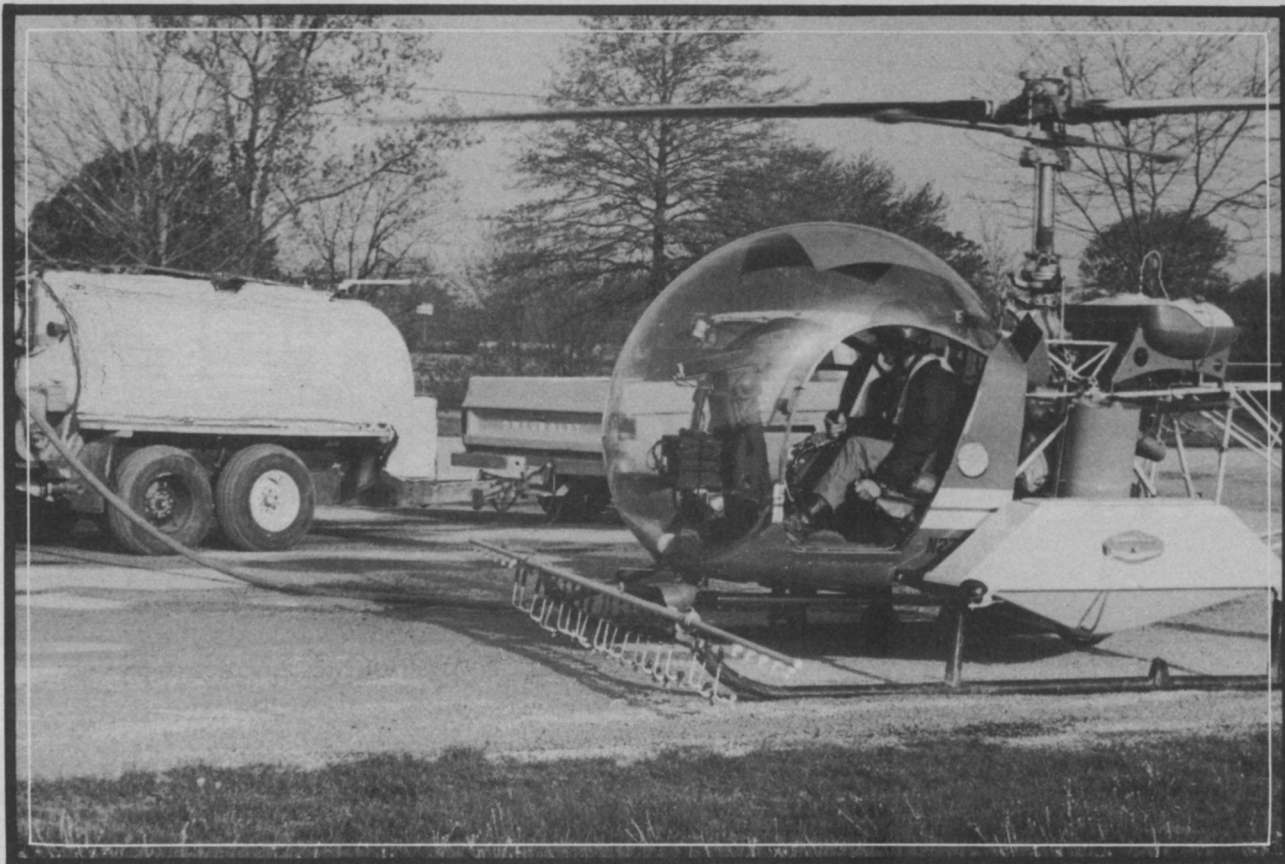
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For More Details Circle (107) on Reply Card



## Crabgrass Protection From The Sky

**S**UPERINTENDENT, Roger Schmitt, was on the phone for the second time in a morning that was still only 5:45 a.m. "old."

In the dark hours of the night, he had made a critical management decision. His Crawford Country Club must get the services of a helicopter. Not in a few days, but immediately, he nodded. If his course was to survive the onslaught of the poorest spring on record in mid-America, something had to be done.

It was raining in Robinson, Illinois, and had been for weeks. The swollen Wabash River, just a few miles to the east, was feeding an already flooded Mississippi, attesting to the water-soaked problems facing mid-west golf superintendents this year.

For Schmitt, the constant rain had prevented him from getting equipment out on the course. His spring weed control program, normally initiated weeks before this day of April 26th, had scarcely been started. Moreover, the course had a history of severe crabgrass problems. Fairways were drenched with water, and greens and trees were super soaked. Just try pulling a tractor out on the course and it would mire

down in the soft ground.

Increasing the pressure on Schmitt was the PGA Shrine-Robinson Open Golf Classic slated for Crawford County CC on July 9th. With this event little more than two months away, he couldn't chance a crabgrass infestation.

On the other end of the phone line was the Ueding Flying Service, about 30 miles away in Vincennes, Indiana. Schmitt wanted them to apply Dacthal W-75 herbicide to his fairways by helicopter. Ueding had applied Dacthal by air before so they knew there would be no problem with the chemical; however, there was a problem with the weather.

Yesterday, it had rained hard and they couldn't fly. This morning, high winds were adding to the flying problem.

"What about this afternoon?" pleaded Schmitt.

"It's just about impossible," responded the voice on the other end. "It looks like Sunday will be the first available day."

Sunday, April 29, came and Schmitt's anxiety increased. There were already definite signs of crabgrass germination and a few more

days of delay could make it too late for preemergent control.

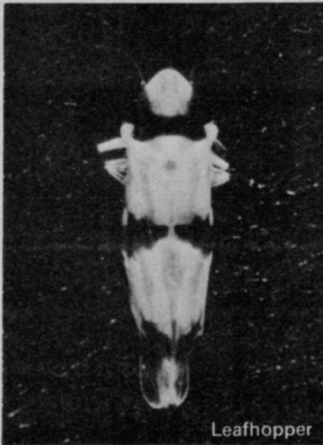
Another call to Ueding assured Schmitt that a chopper would be there to start spraying the Dacthal by noon.

"Once Jim Decker landed the helicopter, I was sure everything would go well," recalled Schmitt. They were using a Bell 47D1 with a simplex low profile spray system. The boom was a toe mounted 18 ft. boom covering a spray pattern of 35 to 40 ft. The nozzles were 10S and 40S with a total of 40 nozzles on the boom. The Dacthal was applied at a rate of 16 lbs. per acre using 16 gallons of water per acre.

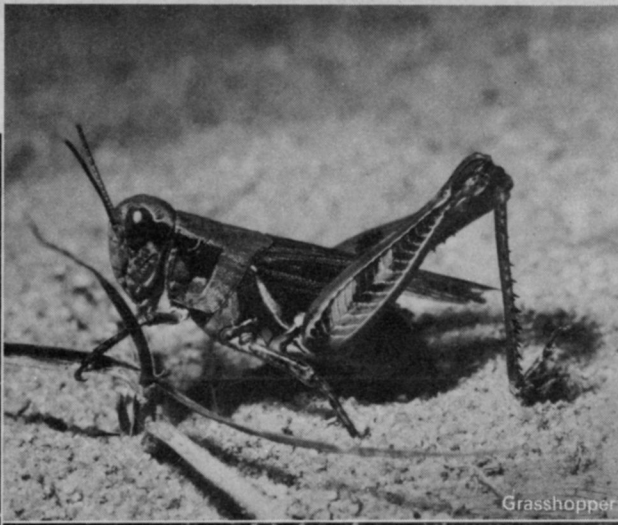
"I used Dacthal because I know it gives excellent control," reported Schmitt. "We've used it on this course for the last four years and changed the looks from 50 percent crabgrass to about 10 percent."

### MANAGEMENT SUCCESS

All that is history now. It only took about an hour and a half spray all the fairways with Dacthal. And, aside from problems brought on by a continuing wet spring, the course was in excellent condition by  
(continued on page 76)



Leafhopper



Grasshopper



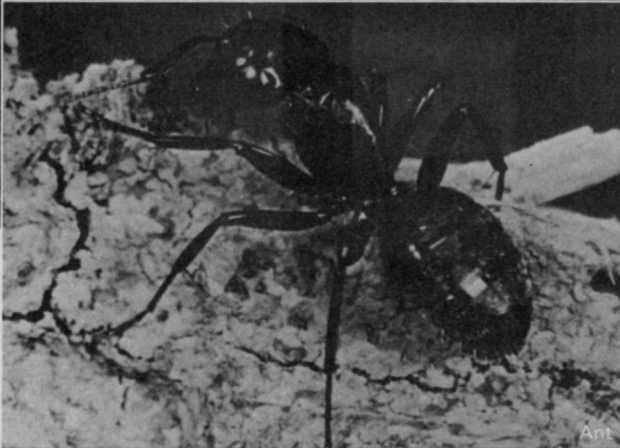
Hairy chinch bug



Cutworm



Mealybugs



Ant



Bagworms

Ag-Organics Department, Midland, Michigan 48640

## These are only seven of the turf and ornamental pests Dursban controls.

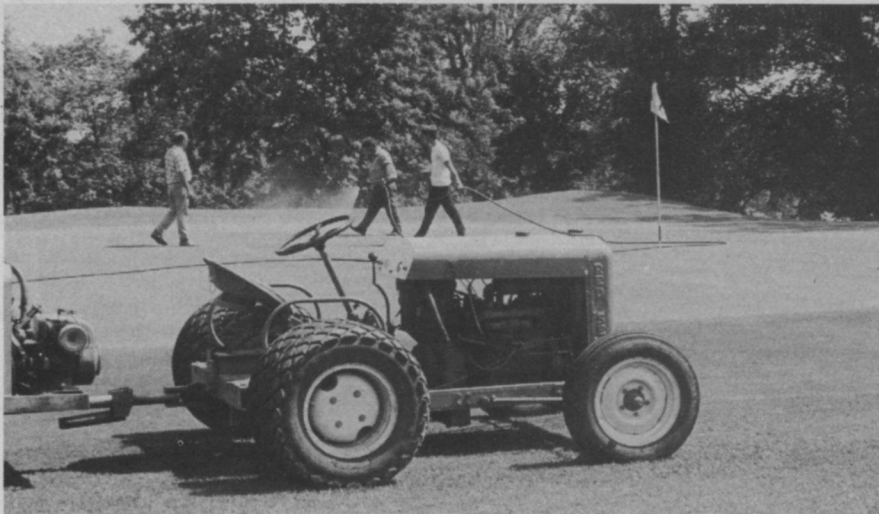
If we had more space, we could show you another seven. Like sod webworms, brown dog ticks, earwigs and *Hyperodes* weevils in turf. Or ornamental plant pests like mites, spittlebugs, exposed thrips, white flies and many more. But our point is, DURSBAN\* insecticide is the choice of professional lawn sprayers when they need to get the job done. DURSBAN insecticide is effective on a wide variety of insects—including resistant strains. And it's effective in a wide variety of applications. It's economical because a little goes a long way. It's non-phytotoxic, and it is biodegradable. So, if you haven't tried it yet, it's about time you did. Just remember to read the directions for use and follow the precautions for safe handling on the product label.

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For More Details Circle (128) on Reply Card



Superintendent Ken Ragan makes regular checks on the quality of work being accomplished on his course. This spray crew is using Betasan to control *Poa annua*, a problem weed at Greenbriar Hills Country Club.

## Proven Programs For Quality Turf

**TURF** quality and appearance are becoming more and more important on golf and country club courses across the country. The results are being reflected in steadily rising turf management costs.

Although per course labor forces to maintain this quality have been decreasing, today's labor represents a great deal more specialization than

a few years ago. Equipment, too, while more efficient, costs more to own and operate.

As one typical grounds superintendent put it, "It's getting to the point where club members and management are demanding better greens, tees, fairways—even roughs need to be treated differently!" To meet these demands course and club



Ragan makes the first pass with this greens mower to make sure everything is in good working order. His grounds management budget has increased only about 15 percent in the last six years.

managers and grounds superintendents are moving to more irrigation, higher soil fertility, better equipment, and selective chemical weed control. This means that superintendents must manage course funds as well as they manage the work being accomplished.

Not many years ago a typical good quality course estimated its per green maintenance at about \$3,000. Today this could run as much as \$5,000 or \$6,000 on a comparable course.

However, one of the least costly elements, but one of the most important, of a good turf management program is weed control. Today's herbicides are easy to use and highly effective in terms of dollars invested.

Here's what some representative grounds superintendents have to say:

Ken Ragan who manages the grounds at the Greenbriar Hills Country Club in St. Louis, puts it this way: "We have used herbicides here for quite some time. It's been necessary to contain *Poa annua*, goosegrass, crabgrass in the greens. We've been on a *Poa* elimination program for three years with Betasan and it's proven quite effective.

He reports that some of his old greens were as much as 80 percent *Poa*. "Under our three year program I've reduced this to 30 percent or lower," he says. And he looks for continued reduction of infestations.

On tees, he has just started a regular weed control program, also using Betasan. "It's applied in the fall and it looks good so far," he says. "I expect to continue with it." He sprays twice a year usually—once in April then again in September—because *Poa*, for example, germinates both in the spring and fall.

Ragan also has been holding back on his fertilization on the greens where he has *Poa* problems. "I've developed a combination approach that together, really has done a job on *Poa annua*," he reports. "By holding back on nitrogen—putting the green on almost a starvation diet, so to speak, the *Poa* is seriously held down during critical germination periods."

This season, for example, he applied only one pound of N per 1,000 feet of green. Or just enough to feed his bentgrass and hold back germination of the *Poa*.

Ken attributes the serious *Poa* influx to the natural environmental conditions that make up and surround the course. "Weeds develop

easily in the rough. It isn't long before golfers and equipment and wind move the seed into the fairways, then into the greens," he says. "Then you get patch spots which soon spread into bigger infestations. Some courses, the older ones usually, are nothing but Poa today."

Competition between clubs is also playing a significant role in ground management according to Ragan. "In large metropolitan areas like ours, for example, there are many courses in direct competition with each other and the quality of the course is a determining factor in their popularity," he suggests. "This is something that has happened in just the last five years. But it is now a considerable factor in members and management supporting a program adequate to maintain a top quality course."

Even so, he says his own grounds management budget has not changed very drastically. "Since about 1967 or '68 our budget has increased only about 15 percent."

He attributes most of this to the rise of hydraulic operating equipment, new greens mowers, new tractors, the move to automatic irrigation on some of his water lines, and renovation of greens. "In short,



Fred Becker, sprayman, and Ed DeRousse, hoseman, listen carefully to the instructions of Ragan on how to spray this green. This manager has made his labor force more efficient through the use of equipment, training and chemicals.

we're mobilized," he says. "We use back hoes, trench diggers, and tractors that do much of the work that once was done by hand and then very slowly."

Also Ragan has cut the number of people needed per job. "We didn't cut the payroll, but we made our labor a more efficient force—equipment training, and chemicals have been the key to this."

This trend in turf management practices is supported by the experience of grounds superintendent Gene Griffith of the Shreveport (La.) Country Club. "Weed control is an important part of keeping a course looking good, of course," says Griffith. "We have a lot of goosegrass or what we call crowsfeet, (Editor's Note: These are actually two dif-  
*(continued on next page)*



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Gene Griffith manages 122,000 square feet of greens and 140,000 square feet of traps, not to mention tees, fairways and roughs.



Sand traps are one of Griffith's worst weed problem areas. Nutgrass, one of the toughest weeds to control, is kept down with applications of Eptam herbicide.

ferent weeds. Locally, they are often referred to as the same plant.) so we have been applying a herbicide to keep our greens clean for the last two years."

The program has worked well for Griffith. "We apply Betasan in the spring — first about February and then again up to about June 1st. It gives pretty good control," he reports. "Our difficulty is the re-infestation—I attribute most of this to my golfers tracking it in from the fairways."

It usually starts breaking through about July or thereafter, according

to Griffith. "But, still, that's excellent holding action," he notes.

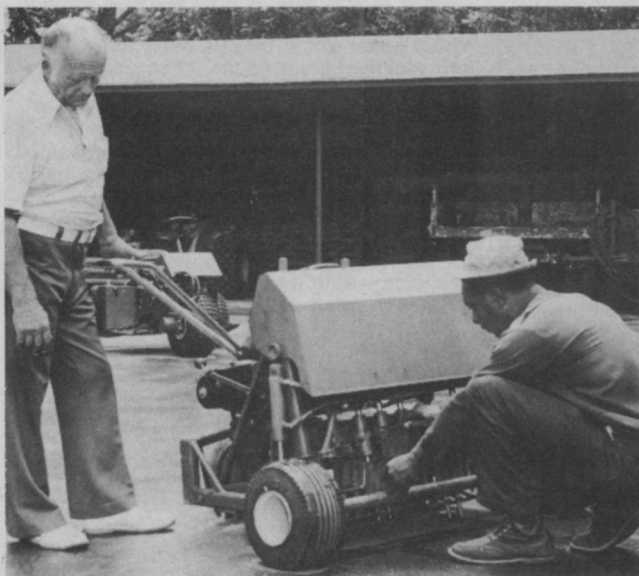
He doesn't put on a second treatment in the fall as many superintendents do because of his overseeding program on winter grass. "The herbicide tends to injure seedling bluegrasses, so we stick to the two early treatments on established stands — overall about 3 pounds per thousand square feet, as is recommended," he says.

As postemergence spot treatment on his greens, Griffith follows with three applications of MSMA with a hand spray about a week apart.

"This picks up 'second generation' crow'sfeet very well," he reports.

Sand traps have been another problem area on the Shreveport course. "We have a terrific nutgrass problem here," says Griffith. "The only success I've had — and results have been just about 100 percent — has been with Eptam herbicide. We put it on June, incorporate it with rakes or with our new hydraulic sand trap rig, and almost forget about weeds for the rest of the season." The treatment usually holds weeds out of traps through the fall.

Our program, while it's doing a



Careful attention to equipment maintenance pays off in fewer repairs and longer equipment life. Here, Griffith supervises the fine setting on this core machine.



It's a never ending job keeping a course in top condition. In addition to regular applications of herbicides, spot job spraying goes on throughout the season.

good job is really a holding action, this super notes. What is really needed is decisive action to overcome our weed problems. This means putting together an effective weed control program in all areas—greens, tees, approaches, fairways, and traps.

"Once this is done, you can reduce your program to a **maintenance** operation rather than the more aggressive campaign that we wage against weeds now," he says.

Even so, this 18 hole, 50 year old, short position course is well maintained and manages to attract some of the best golfers and tournaments in the area. "We have 18 holes—122,000 square feet of greens and 140,000 square feet of sand—it's well trapped."

As far as the future is concerned, Griffith sees course maintenance budgets on the increase everywhere. "The demand for better, near-professional-level courses is increasing," he points out. "To get this most clubs are just going to have to spend more—it's as simple as that!"

Ervin Graf supervises an entirely different type of course operation in McFarland, Wisconsin. And he has some very different ideas about course maintenance. His responsibility covers a total of 77 holes spread over four courses.

"Our turf varies quite a bit and so our management programs vary too," says Graf. "Probably most typical of the way we like to handle a course is illustrated by our professional, 36 hole course. It's the newest, starting operation in 1967." Not long after opening, he began to



Graf has adapted this truckster to handle a spray rig. It allows him to pull right across greens without any damage.

see *Poa annua* start to encroach in some areas on the course and within two years he initiated a chemical control program.

Graf started with Betasan applied both as liquid and a granular on the greens and the trees. "We wanted to see how each worked. Both took care of the weed problem, but we found the granular was better for us. It's easier to apply, it's compatible with our fertilizer, and there is less drift so application is more uniform.

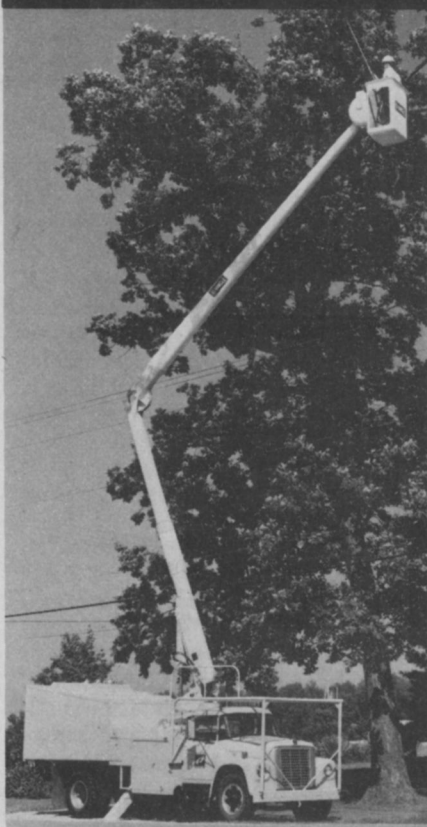
"From our experience, early fall application is the best and with

some exceptions we put on the full rate at this time," Graf reports. This program has been highly successful according to Graf, virtually eliminating his poa problem.

But weed control on greens and tees does not completely solve all the problems. "We started putting chemical on our fairways two years ago when we felt *Poa* was starting to become evident—over 175 acres of fairway on the 36 hole course—and this, too, has been fairly successful," Graf says. On the fairways he applies Balan benefin herbicide

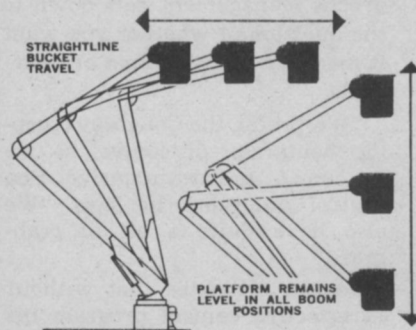
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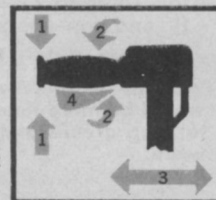
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in combination with fertilizer.

"This is the real key to our success, I think," Graf says. "We apply fertilizer in accordance with precise soil analysis to build up the vitality and strength of our grass. Then we apply herbicides as we need them. This adds up to a highly effective one-two punch that we feel is the answer to many of our management problems here."

On sand traps, Graf has developed a special program that he feels shows a lot of promise. "We have a really serious problem in the sand with quackgrass," Graf says. "The usual weeds are tough enough, but quackgrass is something else!"

Graf devised a program that he indicates knocks out the quack problem without causing any potential chemical residue problem or injury to the greens. "We spray Dowpon

and Amitrol T at special rates," he reports. "Results have been good."

"We try to put on about 160 pounds of nitrogen per acre to improve fertility on fairways. We divide that into three applications—spring, summer, and fall," he says. "In the spring we apply about 1¼ pounds of N per thousand square feet in combination with Balan herbicide. In the summer he applies Milorganite, a natural organite fertilizer. In the fall he puts on a final application of 24-0-12."

Fairways are about 50 percent bentgrass, the rest mostly fescue and bluegrass. Graf has mixed feelings about which variety is best. "Bentgrass is really the golfers choice, but we feel bluegrass is much more practical and easier to manage. There are bluegrass varieties coming

along that are said to combine the advantages of both."

Costs? Graf states that his present overall budget is about \$650,000 for his 77 hole complex. Management budgets are being stressed he points out, because of the competitive factors mentioned by superintendents Ragan and Griffith.

"In the last five years or so we have seen a type of 'boom' in golfing and along with it an increasing public demand for better quality courses," Graf reports.

We find this reflected in public courses, too, where the golfers are demanding the kind of turf quality that once was provided only by the better private clubs. We think we have gone a long way toward providing it here," Graf says. Besides turf protection chemicals and pre-

## A Control Program For *Poa Annua*

To course superintendent Hobart Burgan at Quail Creek Country Club in Oklahoma City, greens management gets down to the question of whether you want it made up of *Poa annua* or bentgrass.

"We prefer the Cohansey creeping bentgrass, of course; so we are on a pretty intensive *Poa* control program," he says. "We also have quite a bit of crabgrass."

Burgan estimates that without an effective control program his greens would soon run up to more than 80 percent *Poa*. "We have an effective program applying Betasan right after we aerify and top dress," he says.

"If we didn't keep after it, the

seeds start blowing in or tracking in from the fairways and reinfest the greens.

"We have a fairly constant wind here—it averages about 14 miles per hour—so we know there is always some seed blowing in on the greens. This is a problem we have to live with and keep after," Burgan says.

His weed control program is supplemented by a high fertility program.

"We feel the grass is going to benefit more from it and compete better with the weed population," he says. "When you add the chemical program to that, it makes for effective management."

Burgan applies Betasan both in the spring and fall and sometimes in mid-summer if the

weather is moist enough to encourage weed growth.

"Usually, though, it's hot and dry, so that we don't need the summer application," he says. "What we try for is season-long control."

His main problem is and probably will continue to be traffic. "Heavy use of the course is the greatest test of our maintenance program," Burgan says. "We feel we are handling the problem adequately today, but work has to be done to improve traffic movement to minimize the wear and tear on the course.

"We also look for better, more refined equipment to make the job of keeping a quality course in good shape with a minimum of time and labor."

Without an effective weed control program, this fairway would be more than 80 percent *Poa*. Burgan has been able to keep greens and other turf areas relatively free of this weed.

Traffic is the main problem at Quail Creek Country Club. And it's on the increase. Heavy use has tested this superintendent's management skills.





cision fertilizing, Graf attributes this to the variety of better equipment now available.

"On our 36-hole course we have about 175 acres of fairways, 15 acres of tees, eight acres of greens, and about six acres of sand," he says. "On a course of this size and diversity, you require the best in mobilized equipment to keep it operational."

Graf has modernized with such equipment as power sand trap rigs, utility trucksters with attached spray rigs that can pull right across greens without any damage, and other motorized units that have very effectively improved course management efficiency.

All together, these super-intendents have shown that modern turfgrass management is built on proven programs. Whether it be weed control or better fertility, the objective is quality turfgrass. □

## Rotary Engine Mower Tested By Irvine Ind.

The grass is not only greener on the Irvine Industrial Complex side of the fence, it's more plentiful. This was the finding of a group of German engineers and an executive of a leading U.S. landscaping supply firm. They were in Southern California recently to test a new German-made Wankel-engine powered rotary lawnmower.

A test team from the Wolf-Geraete Company of Betzdorf, West Germany, accompanied by W. Page Mays, Jr., manager of West Coast research and development for O. M. Scott and Sons, selected the IIC and the Irvine Company's nearby Big Canyon Country Club in Newport Beach for performance and reliability tests on two new mowers. They found that this area is one of the few places in the United States with the soil and climate in which all types of grasses can be grown year around.

Mays said the IIC was selected as a test site because its masterplanned industrial environment includes spacious grass corridors and lush landscaping.

Bill Borden, IIC environmental control manager, observed the tests at the IIC headquarters conducted by Mays and the three Wolf-Geraete engineers. The team tested two self-propelled Wankel-powered mowers with results Borden termed "very impressive."

The mowers, driven by a 5-horsepower model of the Wankel rotary engine, are mini-versions of the

rotary engines used in the Mazda automobile. They have a unique blade system, which unlike rotary-blade mowers, neatly slices grass blades without tugging at them.

Borden noted the revolutionary new mowers sliced through grass in the IIC which was too lush and thick to be handled by a conventional piston-powered rotary mower.

Mays said the mowers tested at the IIC are now in limited production in Germany. The pair tested under a reciprocal agreement between Scott and Wolf-Geraete were operated 50 hours under a variety

of conditions, then disassembled to check their internal operation.

Horst Runte, head of the German engineering team, said particular attention was paid to condition of the rotor combustion seal, a critical factor in Wankel engine operation. Runte said advantages of the Wankel mower over conventional models include potentially greater reliability, better power to weight ratio, fewer exhaust emissions, and far less noise and vibration.

Mays said there are no immediate plans to market the Wolf-Geraete mower in the United States.



## MILORGANITE FOR DORMANT TURF

The following advantages of applying Milorganite on dormant turf may fit your maintenance program. Check them carefully.

- 1. It works!** Milwaukee Country Club has applied 800 to 1200 lbs. Milorganite per acre each and every winter since 1932. The time — Thanksgiving week, before heavy snow fall on irrigated creeping bentgrass fairways. It works on bluegrass and fescue too.
- 2. It Eliminates Spring Feeding!** The grass "greens up" early without over succulent growth. The first calendar year feeding at Milwaukee Country Club is the second week in June — Milorganite, naturally — again since 1932.
- 3. It's a Work Saver!** No more worries about wet Spring seasons and lack of Spring labor. November through January applications (slightly earlier in Northern Canada) are made on dormant turf with no golfer interference and when the work load is light.
- 4. Delivery is Prompt With Nitrogen at its Highest!** October through December are slow shipping months. Thus, rail cars and trucks can deliver promptly. The same months find production of Milorganite with nitrogen at its highest. It is not unusual to get a half percent bonus over the guarantee of 6%.
- 5. Storage is no problem!** Unlike chemicals and some synthetic organics, Milorganite is non-leachable. Its weight and adherence qualities also make it stay in place even on severe slopes.
- 6. Earlier greening than waiting until Spring and applying a chemical!** Plot work in Minnesota proves this. In one series of tests conventional applications of other nitrogen fertilizers failed to catch up with early winter applied Milorganite throughout the entire growing season!
- 7. It will not increase snowmold!** This disease, or for that matter any other, have never been problems at Milwaukee Country Club, where fairway fungicides have never been used. In plot work, we have purposely applied the excessive rate of 200 lbs. per 1,000 sq. ft. with no snowmold observed. Putting greens should be protected with the fungicide applied dry using Milorganite at 30 to 50 lbs. per 1,000 sq. ft. as the carrier. This has been standard practice for many years in the north country.



**CAUTION:** The above statements apply to Milorganite only. Disastrous results have occurred through the use of other fertilizer materials on dormant turf in some instances.

**ASK YOUR GRASS:** Convenience — Savings — Success have sold many clubs on a winter Milorganite application, in lieu of spring feeding. Just ask the grass, your grass, what it thinks of the suggestion. Do it this winter shortly before heavy snow falls.

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With a long tradition for quality, Preakness Hills Country Club is concerned with drainage. Elmers uses drainage tile and gypsum to keep drainage problems to a minimum.



Elmers illustrates the excellent root growth on this putting green. Gypsum has eliminated the heavy clay compaction in the soil.

## The Winning Combination At Preakness Hills

**T**HERE is a lot of tradition at 45-year-old Preakness Hills Country Club, Wayne, N.J.—from the turn-of-the-century club house to a course with a reputation for quality.

But that doesn't mean that golf course superintendent Arthur Elmers can rest on past laurels in providing

top playing condition at the par 71, 6400 yard links. The course keeps Elmers and his nine-man crew busy all year.

One of his main concerns is drainage. The course is located in a glacial lake area. A big problem. But he has worked out a winning combination of tile drainage and soil treatment during his 14 year tenure at Preakness Hills.

"About 13 years ago," he recalls, "in discussing our drainage problems and heavy clay soil with the state soil conservation service, they suggested application of gypsum and tile system in the low wet areas of our fairways. Gypsum breaks up the clay compaction, thus improving aeration and drainage. We've used it every fall since then and we can report excellent results.

"Every course superintendent knows the difference good drainage makes," Elmers continued. "The putting quality is better. We get a green that holds a shot. The course also holds up better during a summer dry spell.

"We've found gypsum to be an excellent soil conditioner. In addition to breaking up the clay, it's a source of calcium and sulphur. It's inexpensive and it also stretches our budget by making our fertilizers more effective," he said.

Elmers' job isn't just improvement of existing greens. He's completely replaced several greens . . . often from land that was considered swamp. Each improvement has meant better conditions for the club's 225 members.

He's found that gypsum sometimes plays an important part in the ever present fight against disease. "I had a Helminth problem on a green, due to poor drainage," he said, "but it was corrected in three years with nearly a ton of gypsum to the acre in the area over those three years. Now we use a maintenance does of 30-40 lbs. per 1,000 sq. ft. each year."

The Preakness Hills crew uses a drop spreader and Grand Prize Lawn & Garden Gypsum in 50 lbs. bags. Play is not halted for any longer than it takes to spread the mineral.

Preakness Hills boasts some attractive water hazards, too. Elmers reports an added bonus for their gypsum. He says it keeps his ponds clear. □



This drainage ditch below a new 15th hole gives evidence of its past as a swamp. Course combines excellent drainage system with effective soil treatment.