things with a D8 Cat you'd have difficulty doing with a pencil. You'll see something different at different times of the day. It's going to be some kind of beautiful."

The new nine was grassed in July and could be in play as early as January. After that, attention can be turned to bringing the older front nine up to snuff, a task which may not be completed until 1982. An additional advantage, beyond the desert views everyone hopes will be nothing short of spectacular, will be the ability to start players even on Tucson's rare frosty mornings. The current first holes are near the Canada, the lowest point on the course and the area most likely to accumulate and retain frost. The hillside holes will be above the frost line in clear, early morning sun, allowing players to start from the higher ground and finish below when the frost clears.

Tucson National currently has 42 guest rooms ranging from deluxe bedrooms to self-contained casitas ("little houses") for conferences, golf schools and vacationers. Nanini plans to expand that number to 120, especially with Golf Digest committed to 8 or 10 schools a year, in addition to schools run by Obitz & Farley and John Jacobs.

Executive groups from Boeing aircraft to Beatrice Foods have been frequent guests, finding the club's seclusion more conducive to relaxed business (Nanini's word for it is "workations") than such high distraction destinations as Las Vegas. Practice areas will also be enlarged, with dual driving ranges and putting, sand blasting and chipping areas designed to accommodate schools of 20 to 40 students without interfering with member practice areas.

"As I see it," Nanini offers, "this will be a golf course and tennis operation consisting of people who want to live in this environment and be associated with a high amenity golf and tennis facility. There are retired people out here, a great many of them, and they love golf. We are trying to create a golf course that is interesting for the higher handicap and older player, yet can be stretched into a challenge for the professional and lower handicap golfer."

With four sets of tees, the course can be adjusted from 5,800 yards for ladies to up to 7,500 yards. Most members play it at about 6,400 yards; the PGA at about 6,500. The USGA, Nanini adds, would probably play a U.S. Open at about 7,200 yards.

The club currently has 600 members, but only 275 are active golfing members, which is not quite enough, Nanini feels. The new facilities will comfortably handle as many as 1,500 members in various categories, most of them people who will live in the housing being created on the perimeter in orderly yearly increments of about 100 units.

"We want to make this the most beautiful and prestigious desert golf course in the Southwest," Nanini says, "and have the kind of quality course that will attract a U.S. Open in the next few years. That's my real ambition and desire. We have a large enough city to provide an audience. We are better, in June, than a lot of other places it has been played, in terms of weather. And we will have a truly challenging course, the kind of test USGA officials look for in picking a site."

When it comes to gambles, Nanini figures he's betting with a handful of aces. **GB**

A look at the past— a glimpse at the future

by Donald D. Hoos, Western Director, USGA Green Section

"Whew! It's almost over," might be the best description n or the past year from Southern California golf course superintendents. Mother Nature made life miserable for many golf courses throughout the year. It all began in February when the skys opened and dumped bucketfuls of rain on a Southern California accustomed to teaspoonfuls. Golf Courses were literally washed away. Particularly hard hit were the San Diego and Palm Springs areas.

If we can look for something positive from such a catastrophe, perhaps the rains will be beneficial in the long run. Courses that received extensive damage were built in low-lying areas through primary runoff areas that are unsuitable for real estate development. This is a common practice in Sun Belt areas where the majority of new golf courses are built in conjunction with real estate projects. With the high cost of land for development, the only land left for golf course development is marginal land. As land around the golf course is developed, runoff is increased and the only place for the water to move to is the golf course.

Unfortunately, many have not been engineered to handle the amount of water they now receive. Because of this year's damage, many courses are now working to solve the problem. Courses are being reengineered to solve the runoff problem; drainageways are being deepened, widened and straightened. Holding capacity is being increased and silt deposits are being removed to provide positive flow. Hopefully, new developments will learn from this year's experience, and proper drainage will be provided as more marginal land sites are developed into golf courses.

Nematodes, and you must be kidding?

As if winter floods were not enough, we also experienced an unusual summer. Most Californians expect some hot temperatures in August and September. That's normal—right? What Californians don't expect is humidity. This year, we had humidity!

With the humidity came higher than normal disease activity. Summer diseases such as pythium, *Fusarium roseum*, Helminthosporium leafspot, and anthracnose were noted on many courses. Several courses also reported high populations of plant parasitic nematodes and had to implement control measures. In the past, nematodes have not been considered a significant pest on turfgrasses in the West. With this year's high nematode populations on a number of courses, planning for next year probably should include a check of nematode populations. This is particularly true at courses that suffered disease activity. On courses reporting high nematode populations last year, there appeared to be an interaction between nematode and disease activity. Once nematode populations are reduced, significant reductions in disease activity were also achieved.

The floods of last winter caused several courses to alter their drainage patterns, sometimes drastically.

What about the future?

Perhaps one of the most significant trends on the West Coast is the use of effluent water for irrigation of golf courses. With each passing year we see more and more areas irrigated with reclaimed water. Because of our total reliance on irrigation for 6 to 8 months of the year, a reliable water source is imperative. With populations continuing to shift to Sun Belt regions, greater demands for potable water sources for domestic use are continuing. The percentage of this water available for irrigation purposes will continue to decrease. The demand for effluent water for turfgrass irrigation will, and should continue. No significant problems have occurred to-date.

A recurring topic that comes up during visits with golf course superintendents and club officials is economy. Ways to save money and keep playing conditions at the same level are constantly being sought. This is certainly one of the major challenges facing golf courses in our western region. A re-examination of our entire golf course maintenance operations is probably needed. No area that affects the budget should be considered sacred. In our region, the use of water on the golf course affects a great many of our budget items. Its use and misuse should be thoroughly evaluated at every golf course.

The West, perhaps more than any other part of the country, has more direct control over the water that is applied to a golf course. Because of this, courses in this area should be setting the example for other areas of the country in the efficient use of water. Not an easy job, but one that is long overdue. **GB**

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Herbicides control annual winter weeds in bermudagrass turf

B. J. Johnson[1]

Weeds are commonly found in bermudagrass turf during the winter and early spring throughout the Southeastern United States whether this turf is used for lawns, parks, athletic fields or golf courses. Mild winter temperatures favor rapid growth of these annuals. When bermudagrass goes dormant in the fall after the first killing frost, it does not compete with germinating winter weeds. Bermudagrass overseeded with a cool-season grass will offer some competition with the weeds and a good quality turf not overseeded will usually have less weeds than a lower quality, poor stand of turf. However, in most instances winter weeds will continue to be a major problem in all turfgrasses and detract from the appearance of the area (Fig. 1).

Herbicide treatments

Herbicides can be applied for preemergence or post-emergence control of many winter annuals. It is important to identify the weed species before selecting a herbicide for use. This is necessary since most of the chemicals will not control all of the different week species (Table 1). Controlling weeds in bermudagrass overseeded with cool-season grasses must be treated differently than non-overseeded turf. The results reported herein are for bermudagrasses not overseeded during the fall, winter or early spring.

Figure 1. *Winter weeds not controlled distract from the surrounding beauty.*

Preemergence control

Dates of preemergence herbicide treatments are important in obtaining optimum control of winter annuals. In the Piedmont region of Georgia, herbicides applied in July or August failed to control weeds as effectively as when treatments were delayed until September or October. The high temperatures during July and August reduced herbicidal effectiveness. Treatment should be earlier when herbicides are applied in Northern areas, but should be later in Southern areas. Regardless of location, most preemergence treatments must be applied prior to germination and emergence of weeds. Pronamide is an exception since the chemical possesses both preemergence and postemergence activity on weeds. Cooler than normal temperatures in late summer or early fall could also make an earlier treatment date necessary.

Pronamide. Fall application of pronamide controlled annual bluegrass (*Poa annua*), corn speedwell (*Veronica arvensis*), and common chickweed (*Stellaria media*), but did not control henbit (*Lamium amplexicaule*), spur weed (*Soliva spp.*), parsley-piert (*Alchemilla microcarpa*), or hop clover (*Trifolium agrarium*). Date of treatment would not be as critical for pronamide as it would for most other preemergence treatments since it possesses both preemergence and postemergence activity on the weeds. Pronamide should not be applied to any cool-season grass because of severe turf injury. Pronamide is very water soluble and the chemical will move in rain water from treated into untreated area. Therefore, caution should be taken to prevent treatment in areas where washing could occur.

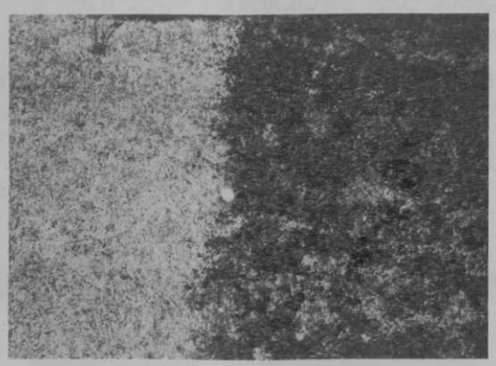


Figure 2. *Henbit and common chickweed control in left plot treated September 29, 1975 with benefin compared with no control in right, untreated plot. Picture made March 22, 1976.*

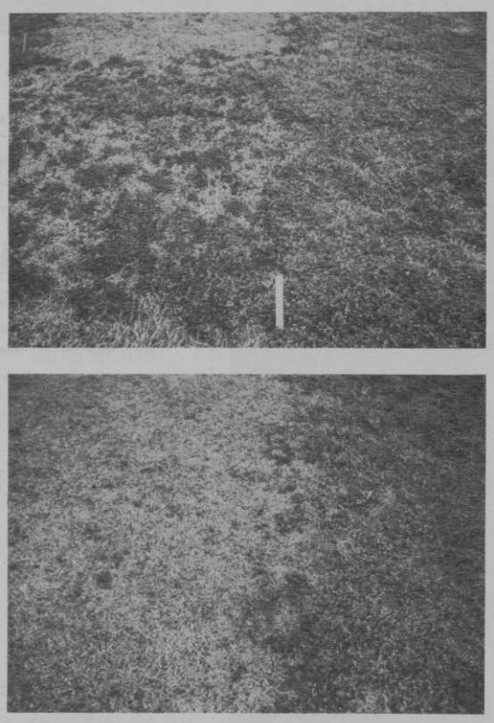


Figure 3. *Comparison of corn speedwell and common chickweed control with one and two applications of 2,4-D at 1.0 pound per acre. Upper: Plot on left treated once compared with untreated plot on right. Lower: Plot on left treated twice compared with untreated plot on right. Treatments were applied February 26 and March 12, 1973. Pictures were made March 26, 1973.*

[1] *Professor of Agronomy, University of Georgia, Georgia Station, Experiment, Georgia 30212. Supported by State, Hatch and other funds allocated to the Georgia Agricultural Experiment Station.*

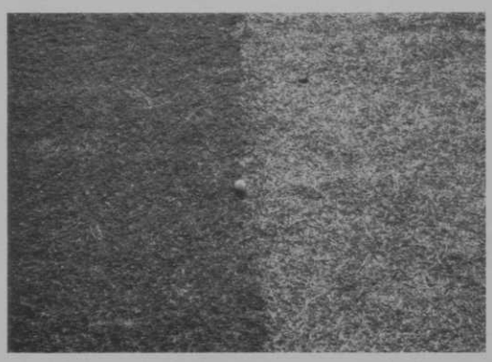


Figure 4. *Glyphosate controlled all winter annuals in dormant bermudagrass turf in the right plot when compared with untreated plot on the left.*

Benefin. Preemergence treatment of benefin controlled henbit, corn speedwell, common chickweed, and annual bluegrass effectively, but the chemical was not active on spur weed, parsley-piert, and hop clover. Fall treatments must be applied before weed seed germinate for effective control.

Bensulide. Bensulide controlled parsley-piert and annual bluegrass, but did not control any of the other weeds satisfactorily. Parsley-piert control was higher from bensulide treatment than from any of the other preemergence treatments as shown in Table 1.

DCPA. Preemergence treatment of DCPA controlled common chickweed and corn speedwell but did not control any of the other weeds. In some instances DCPA controlled annual bluegrass, but the control was not consistent.

Oxadiazon. Preemergence treatments of oxadiazon controlled four of seven weeds effectively. The weeds controlled were parsley-piert, hop clover, corn speedwell and annual bluegrass.

These results show the importance of knowing weed species before selecting a herbicide for use. With the exception of simazine, none of the herbicides controlled all weeds included in the test area. Oxadiazon and benefin controlled four of seven weed species, but each did not control all of the same weeds. Oxadiazon controlled parsley-piert, hop clover, corn speedwell, and annual bluegrass while benefin controlled henbit, common chickweed, corn speedwell, and annual bluegrass. Pronamide controlled three different species (common chickweed, corn speedwell, and annual bluegrass) while two species were controlled with bensulide (parsley-piert and annual bluegrass) and DCPA (common chickweed and corn speedwell).

When the same treatments were applied for two consecutive years, corn speedwell population increased up to 64 percent in bensulide-treated plots. Spur weed population increased from 2 percent in untreated plots up to 18 and 22 percent in DCPA and benefin treated plots, respectively during the same period. Oxadiazon controlled all major weeds in the area, but wild parsnip *(Pastinaca saliva)*, sandwart *a)arenaria serpyllifolia)* and common chickweed appeared in the treated plots. This indicates that when preemergence treatments are used for weed control, it may be necessary to apply different chemicals each year to obtain effective weed control and prevent a major shift in weed population.

Postemergence treatments

When herbicides are applied for postemergence control of winter annuals, it is usually necessary to apply repeated treatments for effective and complete control. For example, the effectiveness of control from a second 2,4-D treatment compared to a single treatment is clearly shown in Fig. 3.

2,4-D type. In most instances a higher percentage of winter broadleaf weeds was controlled when 2,4-D was applied in combination with dicamba or mecoprop + dicamba than from 2,4-D alone. 2,4-D applied alone controlled common chickweed and corn speedwell, but did not control parsley-piert or henbit. When dicamba or mecoprop + dicamba were applied with 2,4-D, the number of additional weed species was increased to include parsley-piert, henbit and corn speedwell. With exception of common chickweek, it was necessary to apply a second application of the combination treatments to obtain optimum control of all of these weeds.

The 2,4-D + dicamba and 2,4-D + mecoprop + dicamba combination treatments controlled a higher percentage of corn speedwell when treatments were applied in January or February than when compared in March. The control was also higher when second application was applied

Table 1. Weeds controlled in turfgrasses with herbicides.

	Winter weeds						
Herbicides	Henbit	Common chickweed	Spur weed	Parsley-piert	Hop clover	Corn speedwell	Annual bluegrass
	weed control[2]						
Preemergence chemicals							
Bensulide	P	P	P	E	P	P	G
Benefin	E	E	P	P	P	E	E
DCPA	P	G	P	P	P	E	P
Oxadiazon	P	P	P	G	G	E	E
Pronamide	P	E	P	P	P	E	E
Postemergence chemicals							
Atrazine	E	E	E	E	E	E*	E
Glyphosate[1]	E	E*	E*	E	E*	E*	E*
Metribuzin	E*	E*	E*	E*	E*	E*	E*
Paraquat[1]	E	E*	E	E	E*	E	E*
Pronamide	P	-	P	P	P	E*	E*
2,4-D	P	E	-	P	E	G	P
2,4-D+dicamba	E	E*	E	E	E	G	P
2,4-D+mecoprop +dicamba	E	E*	E	F	E	F	P

1/ Turfgrass must be completely dormant when glyphosate and paraquat are used.

2/ Weed control ratings were based on E=90 to 100, G=80 to 89, F=70 to 79, and P=below 70. Asterisk indicates the control was obtained with a single postemergence application and no asterisk indicates the control was obtained with two applications.

at a 2-week interval instead of four weeks. For henbit, the highest control from 2,4-D combination treatments occurred from February and March treatments when the second application was made at 4-week intervals. The control of parsley-piert, spur weed, and common chickweek was not affected by time of treatment nor interval between first and second applications. These results show that 2,4-D combination treatments were influenced by dates of treatment and interval between treatments for specific weeds. Therefore, it will be necessary to determine the optimum dates of postemergence treatments for the major weeds to be controlled within a given area.

Metribuzin. Metribuzin applied as postemergence treatment controlled all winter annuals completely throughout the two-year period in our studies. The control was similar from a single 0.5 lb. ai/A (active ingredient per acre) rate or from 0.25 lb. ai/A applied in each of two applications at 2-week intervals. Inconsistent control may occur when metribuzin is applied as a single treatment at the lower rate. Since metribuzin is very water soluble, caution should be taken when it is used around cool-season grasses. If rain water from the treated area moves across cool-season grasses (bermudagrass greens overseeded with cool-season grasses or bentgrass greens), severe injuries to the cool-season grasses will occur.

Metribuzin applied to dormant bermudagrass turf will not delay turf green-up or early growth in the spring. However, when applied to semidormant turf in early spring, common bermudagrass was moderately injured while Tifway was injured only slightly. The initial injury was temporary and turf fully recovered within 4 to 5 weeks after the initial treatments. To avoid any injury, metribuzin should be applied while bermudagrass turf is completely dormant.

Pronamide. Pronamide has both preemergence and postemergence activity. Therefore, it has an advantage over several other herbicides in that it can be used for weed control in both fall and spring. Postemergence treatments of pronamide controlled annual bluegrass and corn speedwell effectively, but not any of the other broadleaf annuals. Additional broadleaf weeds were controlled from combinations of pronamide with 2,4-D type treatments. Spur weeds were controlled completely from combinations of pronamide + 2,4-D with either dicamba or mecoprop + dicamba, while parsley-piert control was fair from pronamide + 2,4-D + dicamba. It should be noted that when pronamide was applied in combination with these broadleaf type herbicides, annual bluegrass control was not acceptable. This indicates that care should be taken when different chemicals are mixed together and applied as a single treatment. When chemicals are mixed the first time, they should be applied only to small test areas to determine their effectiveness in each area.

Glyphosate-paraquat. When either glyphosate or paraquat is used for postemergence weed control, the turfgrass must be completely dormant to prevent injury to the turf. Both herbicides controlled all seven different weed species included in these experiments. However, it was necessary to repeat glyphosate treatment when applied at 0.25 lb. ai/A rate to control henbit completely and paraquat when applied at 0.5 lb. ai/A rate for similar henbit and parsley-piert control. Either herbicide will control a broad spectrum of weeds in bermudagrass turf as shown by glyphosate treatment in Fig. 4.

In most instances there is little advantage in applying combinations of paraquat and 2,4-D-type chemicals as a single treatment for broadleaf weed control. An exception occurred for spur weed since paraquat applied with either 2,4-D + dicamba or 2,4-D + mecoprop + dicamba controlled a higher percentage of the weeds than did single treatments of either chemical applied alone. However, a second application of paraquat applied alone at 2-week intervals should result in similar control. Therefore a choice could be made between the use of a combination of chemicals applied in a single application, and the use of paraquat applied alone in two split applications.

Glyphosate applied at 2.0 lb. ai/A or higher will control bermudagrass when it is applied to actively growing turf. Since glyphosate at 0.25 to 0.5 lb. ai/A is used for control of winter weeds, we wanted to know the effects of these low treatment rates on tolerance of bermudagrass not completely dormant. This information is needed since turfgrass may turn slightly green during warm periods in winter and early spring before the last killing frost. Our studies revealed that glyphosate applied at low rates will injure semi-dormant bermudagrass just as severely as actively growing

Figure 5. *Turf in the right plot treated with herbicides for winter weed control resulted in excellent turf in early Spring when compared with poor turf in left, untreated plot. Picture was made May 16, 1972.*

Figure 6. *Improper application of herbicide results in poor quality turf.*

turf. However, the turf usually recovered within 6 to 8 weeks after treatment with the 0.25 lb. ai/A rate. Since turf quality during the recovery period would not be acceptable to most turf managers, the turf must be dormant at time of treatment to prevent any injury. Paraquat will also injure semi-dormant bermudagrass turf, but it will recover more rapidly than when treated with glyphosate.

Atrazine. Atrazine completely controlled all winter annuals evaluated in our experiments. The control was effective in some instances from a single 1.0 lb. ai/A rate, but for consistent control it was necessary to apply either as a single 2.0 lb. ai/A rate or 1.0 lb. ai/A in each of two applications. Similar results were obtained whether it was applied during mid winter when temperatures were colder and weeds were smaller or treatments delayed until temperatures were warmer and weeds were larger.

When most .postemergence herbicides, such as glyphosate, paraquat, and 2,4-D type chemicals are applied in January or early winter, additional winter weeds may germinate in treated plots by early spring. Our studies showed that when atrazine was applied in January or later, weeds were controlled throughout the late winter or early spring. Therefore, the use of atrazine may eliminate the need for a second series of postemergence treatment when complete weed control is desired.

Advantages of herbicide useage

The primary useage of herbicides in the fall and winter is for weed control during this period. If the weeds are not controlled, they will compete with bermudagrass the following spring and contribute to a low quality turf having poor spring growth. Bermudagrass cannot initiate good spring growth until hot weather kills the existing winter weeds. When the weeds die, the turf requires time before it can produce enough growth to fill in vacancies left by the dead weeds. Herbicides will eliminate competition from winter weeds and will promote a good quality turf immediately after green-up in early spring. The difference in quality of bermudagrass turf between treated and untreated turf is shown in Figure 5.

Herbicide applications

When herbicides are used in turfgrasses for weed control, care should be taken to determine that the spray equipment is correctly calibrated. Additional care should be taken during chemical applications to prevent nozzle stoppage or failure to lap the chemicals during application. When this occurs, strips of untreated turf will remain weedy, as shown in Figure 6. This type of treatment results in an overall poor quality turf which can be eliminated with care during chemical application.

Summary

No single herbicide will control all different weed species, therefore, it is necessary to identify weeds before selecting a herbicide. All preemergence treatments except pronamide must be applied before weed seed germinate and emerge in the fall. When paraquat and glyphosate are used for postemergence weed control, the turf must be completely dormant to prevent severe turf injury. In most instances when 2,4-D type herbicides are used for weed control, it will be necessary to apply split application at approximately 2-week intervals for effective control. **GB**

McKenzie at Disney World maintaining three championship courses

Walt Disney World in Orlando, Florida, is a complete vacation for some 14 million people every year. Most famous for its theme park and world-renowed cast of Disney characters, it is also a resort community replete with water and land sports as well as a host of nighttime entertainment.

As varied and diverse as they are, Disney attractions do have one thing in common: they must all live up to a demanding standard of excellence, a standard Disney has set by never settling for less than 100 percent in any aspect of its operations.

It is within this challenging environment that Walt Disney World golf course superintendent John McKenzie, under the direction of Phil Ritson, Disney's Director of Golf, oversees maintenance of three championship golf courses and a junior golf course. "Like all Disney employees, my first priorities are the comfort and enjoyment of our guests," says McKenzie, who came to Walt Disney World while it was still under construction in 1970.

The Disney image and standard of excellence prevail on all of the golf courses. And while they may be part of the Vacation Kingdom, the quality of the courses is the result of excellent management and quality maintenance personnel. McKenzie and his staff of 42 full-time employees work constantly to keep the courses in tip-top shape.

Different Challenges

While the same careful management practices are applied to all three courses, each has its own personality, providing different challenges for golfers at any level of experience.

The Palm, Magnolia and Lake Buena Vista courses, site of the Walt Disney World National Team Championship Golf Classic, offer three types of challenge. Rated as one of "Americas 100 Greatest Tests of Golf" by Golf Digest, The Palm is loaded with water. "The back nine is one of the most picturesque courses in Florida," McKenzie claims, adding that the water reduces the need for large areas of rough.

"The Magnolia course," he continues, "is wide open but heavily bunkered. From some of those tees, it looks like a desert." The Lake Buena Vista course, while operating on a separate budget, is also under John's supervision. A tight, tree-lined course, it too is enjoyable and challenging.

While seasonal weather changes may not seem like a significant problem for a Florida golf course, McKenzie maintains that they are. "We are extermely busy during the winter months," he says, "and we alter our maintenance practices for that reason." With each course averaging 200,000 square feet of greens, John has great flexibility in controlling their size. He allows them to spread over the winter so he can alter his pin placements daily to reduce wear and tear on particular sections of each green. During the summer, he'll restore them to their original size to cut back on the time his employees spend mowing each day.

John maintains a hybrid bermudagrass on his fairways and greens. And overseeds the greens with ryegrass from late November through early December.

Greens Maintenance

John maintains the greens at the standard 3/16ths of an inch yearround, while keeping fairways between 3/8ths and 5/8ths of an inch depending on how fast the grass is growing. "During the summer the grass grows too fast to maintain such a short cut," claims McKenzie. "First of all, you are creating a stubble appearance by almost eliminating the leaf surface. More importantly, you are making the grass very vulnerable to stress." He likens this situation to an animal with a wound that never gets a chance to heal. "That animal will never be 100 percent," John observes.

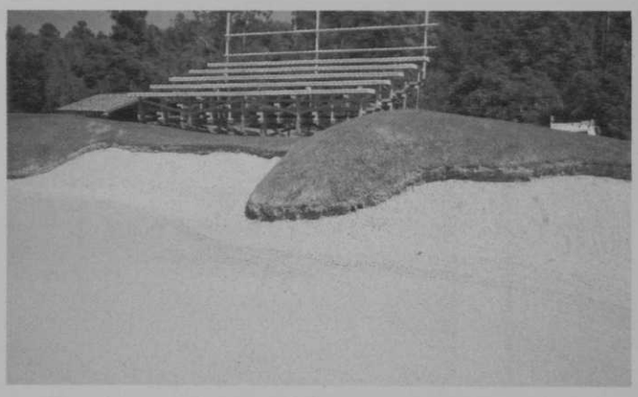
John is now going to "fertigation" on the courses, because he likes to apply liquid fertilizer at night so as to avoid shutting down a course during playing hours. However, since the liquid is extremely soluble and is released into the soil almost immediately under very wet conditions, McKenzie relies primarily on bi-annual applications of slow-release granule fertilizer. All tolled, he likes to apply 26 pounds of N per 1,000 sq. feet of putting surface, and 6-8 pounds on a similar fairway area each year.

"We need the slow release granule out there to give the turf a constant supply of nitrogen," he believes. "It's a chemical-coated form of urea that is broken down by water. We know we can put down 3 pounds and it'll still be releasing three weeks later. If we do the same thing with a pound of ammonium nitrate, I'll have to make another application in a week."

While the greens, tees and fairways present the usual problems for McKenzie and his staff, he finds the bermudagrass is particularly troublesome in and around the sandtraps. McKenzie says the grass crawls down into the traps almost as rapidly as it fills a divot on a fairway. "Bermuda spreads so quickly through its rhizome system that if we left it undisturbed for a month it would cover a third of a trap." To eliminate the need for a man to spend all day edging with a shovel, McKenzie uses a 2 per cent solution of Roundup, applied at a very low pressure, to create a two-inch lip and provide a neat, manicured look.

If long periods of rain prevent McKenzie's staff from making the regularly-scheduled application of Roundup, McKenzie will resort to using a nylon string trimmer. "We just turn it on its side and run it along the rhizomes like Roundup can. It also takes more time," he says.

Bermudagrass is not the only vegetation thriving in the ideal Florida climate. To John's dismay, the tropical sun and rain also provide encouragement to virtually every weed in existence, and add to the difficulty of



In the photo at bottom left on page 18, McKenzie sprays Round-up around the palm trees he uses as 150-yard markers. This prevents tall grass around the base, but doesn't harm the trees. In the photo above, McKenzie places great emphasis on maintaining his sandtraps. "We have so many," he says, "that if they don't look finely manicured, the entire course looks a little ragged." At right, this photo of the Magnolia course shows how some of the greens are heavily bunkered.

control.

Poa annua, a weed that is sometimes desirable in more northern states, is a source of headaches for McKenzie and many other golf course superintendents in the South since low cut grass allows the poa to spread. John bases his control program on pre-emergence herbicides, applying a selective liquid or granular grass herbicide to poa-infested areas prior to weed germination in late October.

Still in all, he's found that these selective applications have not controlled all the fast-spreading *Poa annua*. He now intends to go "wall to wall" with the treatments. "We used to just spot treat our tees and slopes," he recalls. "But what we weren't controlling just continued to spread, and we don't want to let it get out of hand."

"Impossible To Control"

Another fast-spreading perennial that McKenzie considers by far his most difficult weed control challenge is torpedograss. "Every weed presents a problem for us," he points out, "but torpedograss is almost impossible to control.

"We don't have many heavily-infested areas," John continues. "Most of it comes in through canal banks which provide the wet conditions torpedograss thrives on." Having achieved only marginal results with conventional herbicides and diesel fuel applications, John decided to tackle his nemesis the same way he handled bermudagrass. "You can burn torpedograss back with other non-selective chemicals, but it comes back so fast you are always trying to catch up," he laments.

"We haven't found anything more effective for the torpedograss than Roundup," he claims. "You don't have to go back and spray every week like we used to with other nonselective chemicals." The lack of soil activity with Roundup allows him to apply herbicide around all his trees, as well. "We use small palm trees as 150 yards markers, and one application enables us to control any high grasses growing up around them," he notes.

When asked about his other serious pest problems, John quickly points to mole crickets, explaining that "torpedograss and mole crickets are the two most widespread problems for Florida golf course maintenance people."

Underground Damage

Mole crickets cause damage by burrowing underground and feeding on the root systems of bermudagrass. Dormant throughout the winter, they lay their eggs underground and leave holes when they emerge in the spring and summer months.

To control the crickets McKenzie uses systemic chemicals "which we incorporate heavily with water to get the insecticide down within striking distance of the pests."

John is fortunate in that he doesn't face all of these challenges alone. He has a fully qualified assistant for each of his courses—Scott Welder, for the Palm course, Milt Starr on the Magnolia, and Joel Jackson at Lake Buena Vista. They're all experienced professionals.

McKenzie also cites the skill of Larry Kamphaus, his mechanical superintendent, in keeping all the equipment in tip-top shape. Larry fills in for any of the other assistants on their days off, and will also cover for McKenzie.

John McKenzie himself has already reached what must be considered the pinnacle of any golf course superintendent's career. In 1979, he successfully completed all the required work and testing for certification by the Golf Course Superintendents Association of America, a distinction held by less than 500 of his peers across the country. He is also a member of the Florida Turf Grass Association, and the Central Florida Superintendents Association.

Controlling Algae

Sometimes, however, even all his experience and skillful assistants aren't much help in combating certain problems. Algae, for example, is uncontrollable. "You can work at repairing it," John says, "but the sun has got to come out to dry the grass." To help nature along, McKenzie brings up the height of the grass to reduce stress as much as possible, and shuts off the irrigation.

"We have also come up with a way of spreading some of the water around our fairways that don't drain very well," he adds. What he did was devise a squeegee-like attachment for a normal sandtrap rake. The strip of rubber spreads the water around more evenly, or off into a canal or lake where possible."

It's this type of innovation that enables McKenzie and his staff to keep abreast of the challenges presented in maintaining the Walt Disney World courses. Working closely with Golf Director Ritson, McKenzie and his crew consistently meet those challenges.

Classified

CLASSIFIED CLOSING DATES:
January issue closes December 5
February issue closes January 9
March issue closes February 6
April issue closes March 9
May issue closes April 8
June issue closes May 8

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MISCELLANEOUS

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