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Circle No. 121 on Reader Inquiry Card

Frequent mowing at proper heights helps reduce the leaf spot phases of this disease.

Pythium diseases—Warm-season grasses may be affected by pythium disease. Some *Pythium* species cause general decline by infection of roots. St. Augustinegrass is susceptible during prolonged warm, wet periods. Poor surface and subsurface drainage favors development of *Pythium* fungi, and encourages development of algae in areas where disease has weakened the grass.

Provide good drainage and remove tree limbs to increase air movement and light penetration. Some fungicides specifically for *Pythium* fungi have provided additional control.

Fairy rings—These appear as rings or arcs of green stimulated turf which may be accompanied by declining grass and mushroom formation. Problems develop when mushroom mycelia accumulate in the soil and cause the soil to become dry.

Fairy rings may persist and increase in diameter over the years. The fungi feed on old roots, stumps or thatch. Newly-built putting greens may develop infestation after only a few years or even months.

Control measures that have shown limited success include tilling and fumigation or irrigation to saturate the soil for several hours and over several days. It may be futile to attempt to control rings occurring around trees. In this case, consider landscaping the areas with non-turfgrass plants.

There has recently been some success with suppression

in putting greens using Prostar fungicide.

Nematodes—Turf that is heavily infested with damaging nematode species appears unthrifty; weeds invade weak or dead areas. Infested areas tend to wilt prematurely, even when adequate soil moisture is available.

Integrated management uses several methods to suppress the nematodes and maintain the turfgrass so that it can withstand some level of infestation. Although valuable, nematicides provide temporary suppression of nematode levels.

Two nematicides are available and may only be used in commercial turf areas, such as sod farms or golf courses.

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GOLF 'SCAPING

Controlling aquatic weeds

■ Aquatic plants are a component of the aquatic environment that are natural, therefore they are necessary, says Robert Hesser a retired member of the Pennsylvania Fish and Boat Commission.

"Control"—not "eradicate"—is the magic word," Hesser says.

Ponds, most typically those on golf course landscape, serve three functions, according to Hesser:

- 1) They beautify the course.
- 2) They act as water hazards.
- 3) They can be an irrigation source.

The weeds—Aquatic weeds take two forms, Hesser notes: algae and flowering plants.

According to a Penn State University bulletin which Hesser co-wrote, algae is the most common and widely distributed of all aquatic plants. Three different types of algae—plankton, filamentous algae and muskgrasses—are found in the aquatic environment.

Plankton algae (phytoplankton) are single-celled plants that

gather at the top of the pond and frequently look like spilled dark green paint. "They are a pain in the neck," Hesser says.

Filamentous plants are often erroneously described as moss or slime. They tend to look like long strands of hair which can form dense mats or fur-like coatings on rocks and other underwater objects. "They have a way of hiding," he notes, "particularly on hot days when they drop to the bottom of the pond."

Muskgrasses, which resemble some flowering plants, are often rough and gritty to the touch. "They have a skunk-like odor and are very difficult to control," Hesser says.

Flowering plants take the form of sub-emergents (underwater), emergents (above water) and floaters (on the water surface).

"Sub-emergents include milfoil, allodea, hydrilla in the South, bladderwort, coontail and water celery, which is a beneficial plant in most cases," Hesser says.

Emergent plants include arrowhead, cattails, various rushes

continued on page 44

Cleaning up Champion's lakes

■ The lakes at Champion Lakes Golf Club in Ligonier, Pa., needed cleaning. So veteran golf course superintendent Wade Coffman, stretched to the limits of his budget, tried a variety of solutions.

Mechanical raking, aeration and chemical weed control all seemed to work.

"(Aquatic weed control) is one of those things you let slip until someone says something," notes Coffman. "It got to the point, though, when the odor got just terrible in the warm, humid weather."

Champion Lakes—co-owned by former Pittsburgh Pirate baseball stars Dick Groat and Jerry Lynch—has seven bodies of water. Six smaller ponds drain into one bigger lake, which is used as the irrigation system's water supply.

"We put a fountain on No. 13," says Coffman. "There's always been a lot of algae in that pond, and it looked bad all the time. The fountain has definitely helped. We're going to put additional fountains on No. 11—and possibly No. 18, if this is a good year."

Part of the expense involved in



Wade Coffman has tried a variety of solutions for weeds on Champion Lakes Golf Course's seven ponds and lake. Aerating fountains most recently have proven effective.

installing pond aerators is getting electrical power to the ponds which, Coffman observes, "costs a good bit."

Drawdowns and mechanical raking have always been his first option.

"Usually, we draw the pond down a little and rake out what we can," he says. "There are also a lot of new chemicals out that seem to work well. But since we're using the water for irrigation, we have to kind of watch what we're putting in it."

Sonar (manufactured by SePro), Reward (manufactured by Zeneca), Komeen (manufactured by Griffin) and

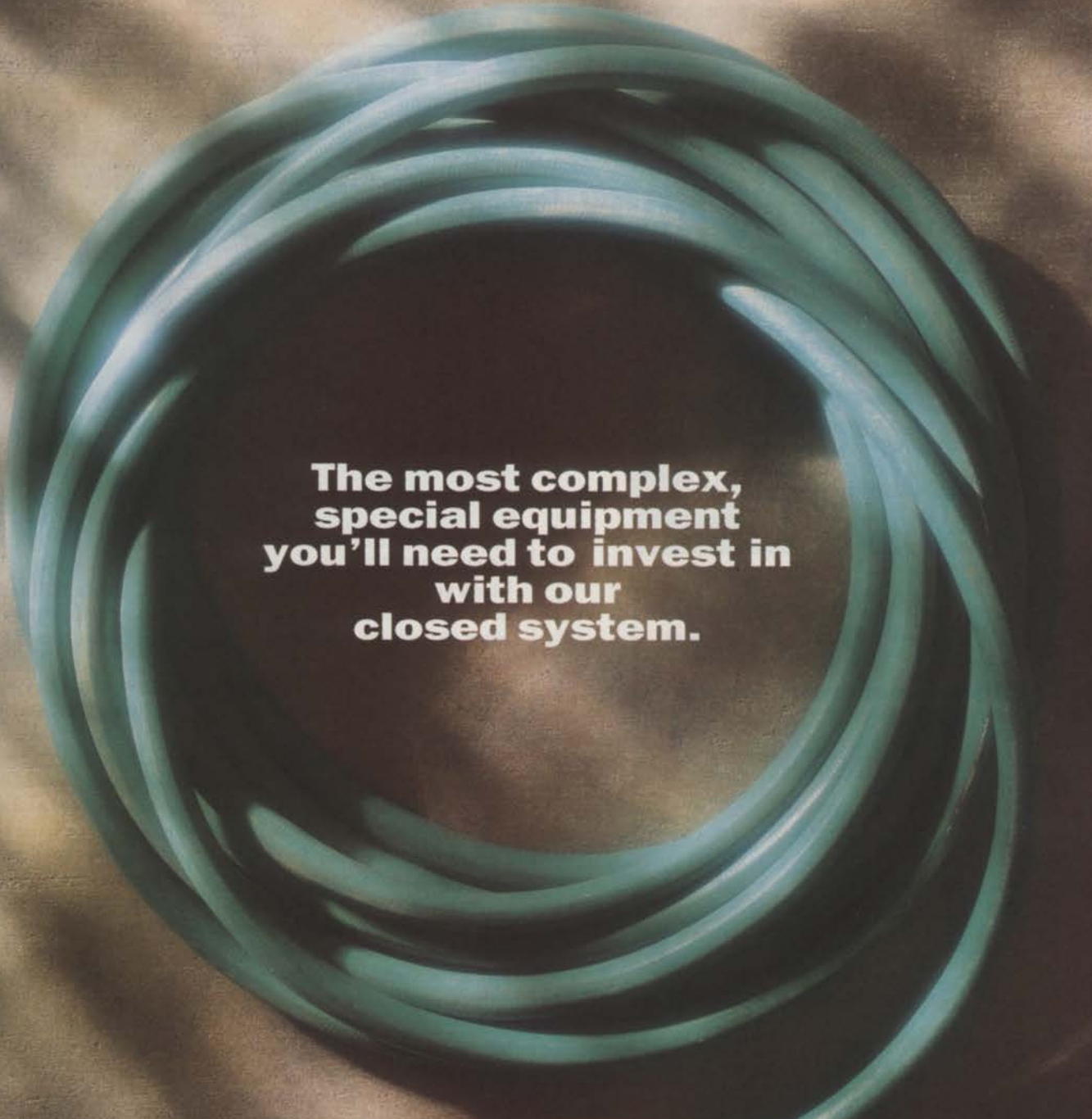
Rodeo (manufactured by Monsanto) are some of the improved aquatic herbicides available. Coffman has been especially happy with the performance of Komeen.

"I'm still trying to learn the names of the weeds," Coffman notes. "You've got to tell the Pa. Department of Natural Resources exactly which weeds you want to treat before they'll give you a permit."

The 18-hole course sits in the midst of the Laurel

Highlands, just a stone's throw from Latrobe, Pa., where Arnie Palmer grew up. Palmer has played Champion Lakes, which is also a favorite of numerous professional baseball and football players, Coffman says.

Most of Champion Lakes' business comes from Pittsburgh-area golfers, who are drawn to the rolling hills, bentgrass fairways and sparkling lakes. "Dick and Jerry wanted a championship course that would be playable for anybody," notes Coffman, who's been the superintendent since the course opened in 1966. —J.R.



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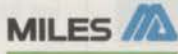
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GOLE-SKIPPING



Milfoil
(*Myriophyllum
spicatum*)

Milfoils have
whorls of
feather-like
leaves.

AQUATIC WEEDS from page 42

which grow along the edges of a water body. "These tend to be not too much of a problem except for cattails, which come from ponds that are too shallow (less than four feet deep) around the edges," says Hesser.

Floaters—most of which are rooted plants with much of their structure floating on the surface—include water lilies, spatterdock, watershield and duckweed.

Control—The best way to control aquatic plants is to prevent excess nutrients from entering the water, the Penn State leaflet says. Control, Hesser further notes, can be achieved either environmentally, mechanically and/or chemically.

Environmental control consists of deepening shorelines, holding water at certain levels, and drawdowns. Fertilization is also an environmental control—one which, Hesser says with some hesitation, will stimulate plant growth for predators.

"I'm not a proponent of fertilization," he continues. "This method of control was developed down south where the longer growing season is prevalent."

Mechanical control consists of cutting, mowing, raking and hand-weeding, all very labor-intensive and sometimes very difficult to achieve. Also included in this type of control are mechanical surface aerators or fountains and compressed air systems.

"The advantages of water aeration include higher dissolved oxygen levels, cooler temperatures through mixing of top and bottom water layers, less aquatic vegetation, and a more aesthetically pleasing water body condition," the Penn State leaflet says.

Biological control of aquatic plants is a controversial method, Penn State says. "And the only fish I'm aware of that will eat some vegetation is the grass carp," Hesser adds. (Triploid grass carp, a genetically altered version, are not legal in all states. They are also very expensive.)

Specialty herbicides, if used, need to be applied precisely according to the EPA label. In some states, such as Pennsylvania, you need permission from the governing state aquatic or agricultural commission before applying chemicals.

Finally, says the Penn State Cooperative Extension Service, "a good understanding of the water's chemical and physical characteristics (pH, hardness, temperature) is highly desirable."

Normal rates of some chemicals like copper sulfate are not as effective in water temperatures of less than 60°F or in water having hardness above 50 parts per million or three grains.

—Jerry Roche

Tricks of the trade:

Pin rotation reduces foot traffic stress

■ "Unbelievably difficult, but fair," was how Ray Floyd described pin placements at this year's Masters Tournament.

In addition to offering a challenge to the golfer, pin placement must also be done in a way that spreads the traffic around during the week.

Moving the cup from day to day routes traffic around the green for minimal turf stress. When done in conjunction with tee placement, pin placement serves as a distance guide for players.

"The whole point of pin placement is that you don't come back to the same spot on the green too soon," says Bob Breen of the USGA Greens Section, who supplied us with the chart shown below.

Unfair pin settings penalize golfers and distort handicaps.

The 18 holes of a golf course should have six difficult—but fair—placements, six placements of medium difficulty and six relatively difficult placements.

No matter which plan you follow, it's likely to be thwarted some time during the season, thanks to wet weather or a dry spell. Modify as needed.

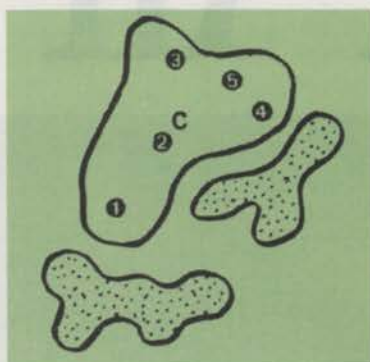
Lee Redman of Sunset Country Club, St. Louis, provided us with these two guides to pin placement.

For the guide at the right, players are instructed as follows:

1. Each day, the flag is placed in one of five zones.

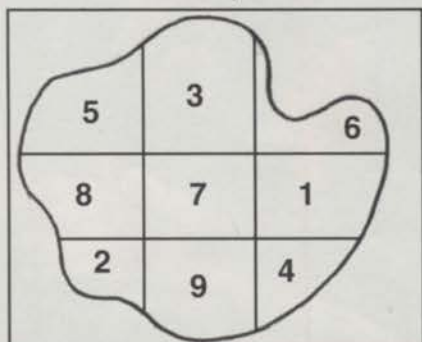
2. Check stimpmeter and flag location sign at the first tee box to know what zone is being used for that day's play.

3. All yardage measured to the center of the green (C).



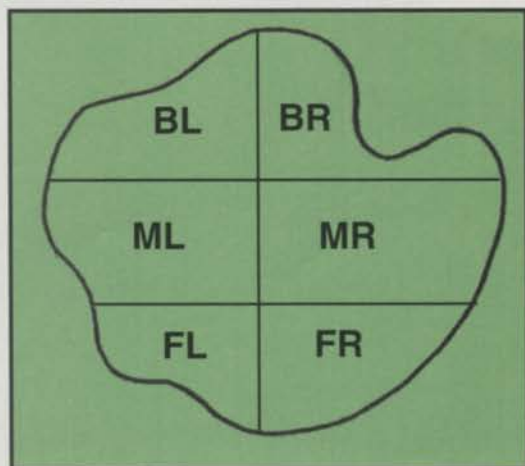
In the system shown below, the green is divided into nine quadrants. Tee markers are positioned in front, rear or center of tees.

Quadrant	Tee marker
1	Center
2	Rear
3	Front
4	Rear
5	Front
6	Front
7	Center
8	Center
9	Rear



USGA suggestion for cup location and rotation schedule*

Hole	Day					
	1	2	3	4	5	6
1	FL	BR	ML	FR	BL	MR
2	BR	ML	FR	BL	MR	FL
3	ML	FR	BL	MR	FL	BR
4	FR	BL	MR	FL	BR	ML
5	BL	MR	FL	BR	ML	FR
6	MR	FL	BR	ML	FR	BL
7	FL	BR	ML	FR	BL	MR
8	BR	ML	FR	BL	MR	FL
9	ML	FR	BL	MR	FL	BR
10	FR	BL	MR	FL	BR	ML
11	BL	MR	FL	BR	ML	FR
12	MR	FL	BR	ML	FR	BL
13	FL	BR	ML	FR	BL	MR
14	BR	ML	FR	BL	MR	FL
15	ML	FR	BL	MR	FL	BR
16	FR	BL	MR	FL	BR	ML
17	BL	MR	FL	BR	ML	FR
18	MR	FL	BR	ML	FR	BL



FL=Front left
FR=Front right
ML=Middle left
MR=Middle right
BL=Back left
BR=Back right

*For a course that is closed one day a week. If your course is open on the seventh day, start back at #1.

Courtesy USGA Greens Section

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Audubon names Collier's Reserve its first 'Signature'

■ Collier's Reserve in Naples, Fla., is the first-ever Audubon Cooperative Sanctuary Signature Golf Course.

Collier's was designed by Arthur Hills and constructed according to Audubon's rigorous planning standards and strict environmental disciplines.

Eco-friendly objectives were achieved in five areas: water conservation, wildlife conservation, habitat enhancement, energy efficiency and waste management. For instance:

● The irrigation system was completely re-designed to become a "prescription irrigation" system, adding \$130,000 to its cost. Each sprinkler head is individually chosen and placed, so that neither native vegetation nor lake/river areas would receive unneeded watering, and so the differing needs of the turf types would be met.

● Several hundred thousand native plants not required by permit were installed. More than 80 percent of the course's vegetation is native.

Tim Hiers, a nationally-recognized expert on Integrated Pest Management and a member of the **LANDSCAPE MANAGEMENT** editorial advisory board, was hired as golf course superintendent. He was formerly with John's Island Club in Vero Beach.

Initially, the Audubon and Collier's had developed a Naturalization Plan that included objectives, an analysis of existing conditions, a conceptual design plan, and an establishment and maintenance program. Site inspections continued throughout construction.

Collier's Reserve must keep up its standards because Audubon representatives will check it regularly to assure that it continues to qualify for the designation.

Six other golf course projects under construction are now seeking similar recognition. Also, the American Society of Golf Course Architects has announced its intention to use the guidelines for all future courses.



Hiers: Selected for his knowledge of Integrated Pest Management.



Once you've determined what areas on your golf course are defined as wetlands, you can take appropriate action, says Nancy Sadlon of the USGA.

USGA official says: know your wetlands

■ You might refer to that often-damp, low-lying patch of ground on your golf course as a swamp, but, more correctly, it's a wetlands. Treat it with respect.

Nancy Sadlon of the U.S. Golf Association, Far Hills, N.J., describes wetlands as unique ecosystems that:

- 1) provide wildlife habitat;
- 2) filter and break down pollutants coming from runoff;
- 3) play a role in flood protection; and
- 4) offer recreational opportunities to people.

Golf course superintendents must be aware of them because of the growing body of regulations surrounding their preservation and management.

"Some wetlands are easy to recognize. Others aren't so easy to recognize," says Sadlon. Generally they must meet the three "Hs" to be referred to as wetlands:

Hydrology—These are areas that are inundated with water for a period of time each year.

Hydric soils—Wetlands characteristically have mucky soils.

Hydrophytic plants—These areas contain plants that like to have their "feet" wet.

To identify suspected wetlands on your course, examine aerial photographs of the property, review federal and state wetland inventory maps, and check with the soil conservation service to identify hydric

soils which are strong indications of a wetland. Unsure about the permitting process of altering a wetland? Consider hiring a wetland consultant, says Sadlon.

"Before we recognized the value of wetlands, some of these areas would have been filled in to accommodate a cart path or perhaps, even, a fairway," she adds. "We have certainly seen interest and recognition of the value of wetlands increase."

Sadlon says superintendents should protect their ponds and wetlands with silt fences and vegetative buffers to minimize runoff and pollution getting into these areas.

"Something every course can do, whether it's an old course or a new course, is to recognize the value of the plant materials around the edges of the wetlands. It acts as a buff, it enhances wildlife habitat and it adds aesthetics to the golf course," she explains.

The lead agency for wetlands is the U.S. Environmental Protection Agency, but the U.S. Army Corps of Engineers regulates the "404 Program" dealing specifically with their management. Sadlon says superintendents should also be aware that wetlands can be protected by local and/or state regulations too.

Sadlon made these comments before 200 turf managers at the Michigan Turfgrass Conference this past January.

—Ron Hall

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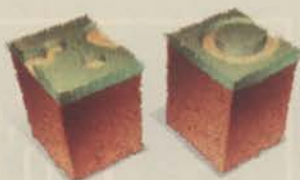


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