

## Drainage tips from superintendents, irrigation experts and builders

Old course, new course. It matters not. "You add drainage every year—forever," said Terry Buchen, superintendent at Double Eagle Club in Galena, Ohio, and one of eight master greenkeepers in the world.

The challenges are more difficult, if not more frequent, on old tracks.

On a new course a superintendent has the luxury of a 6- or 8-inch main line drains. Four-inch drainage lines tie into all these main line drains from the greens and bunkers. Any laterals added to the main lines are usually 4-inch. "It's so easy to add drains here," Buchen said. "Every low spot on our course has a catch basin and we just have to tie into those. Or we can tie into a green or bunker drain."

But, superintendents at older or flat course don't have that luxury. "The flatter the course, without main-line drains and catch basins, you have to add more and more lateral drains," he said. "And the older courses have worse soil types."

Also, older facilities are more apt to have the 18-inch-long Orangeburg tiles, which are prone to break and clog up with tree roots.

Buchen passed along the following tips, along with superintendent Bob Mitchell of The Greenbriar in White Sulphur Springs, W. Va., irrigation consultant Larry Rogers of Lakewood, Colo., Golf Course Builders Association of America President Jim Kirchdorfer of Louisville, Ky., and course architect Jan Beljan of Jupiter, Fla.

- "The best long-term solution for anything," Rogers said, is to gravity-drain the water somewhere out of play.

- Shade is a very big factor. Trim trees where necessary.

- Thatch, especially in the roughs which aren't verticut, can cause wet areas. Dethatch.

- Vertidrain problem areas, Mitchell said. Since Vertidrain makes a deeper cavity, "you might hit a sandy layer below" the water that will allow it to drain. "It's simple—if you're that lucky."

- Walk the course during a heavy rain. Go out with galoshes, umbrella and paint gun. Use paint that's safe on turf and mark where you want catch basins and drain lines. "You've got to know where the water's going to know where the best place is to put in drain lines," Buchen said. "I still do it at least once a month just to see if everything's working."

- "Use PVC pipe," said Buchen. "It's the best. It's much better, more long-lasting, stands up to roots and doesn't crack. It should be cleaned out with rotor-roooter."

"Most use Advanced Drainage Systems (ADS). It is cheaper and good, too, but you can't use rotor-roooter with it, and it can cause problems if you have trees

nearby."

- Using the ultra-light ADS, be certain to sink the top of the pipe at least 12 to 18 inches deep. Otherwise, the pipe will slowly come to the surface in 5 to 10 years. With PVC pipe, go at least 12 inches deep, and preferably 18 to 24 inches.

- Use a surveyor's transit and a rod to make sure the slope of a pipe will have flow. It must have a minimum 1 to 2 percent slope, or fall.

- Find the drain lines by putting a No. 14 irrigation wire as a locator wire in each trench, and using an electric wire locator. (Each irrigation line has a wire in it but drainage lines do not.) Tie the end of the wire to a catch basin so that additional future lines can easily be hooked up to the catch basin.

On an old course, do this when adding new drainage. Use a 100-foot plumber's snake, stick it in the pipe and hook up a wire

locator or use a metal detector.

- Be sure before fighting with nature, that anything that has been introduced, such as irrigation, is properly spaced and is operating correctly. "Spacing is site-determined but should be uniform on a course," Rogers said. "You can design hole-to-hole, but it's poor design to put fairways at 65-foot center, greens 85 and roughs 90. Your applications efficiencies are going down the tube."

- If there are no as-built blueprints, look for records, start to develop records of drainage systems, even to the point of overlaying them on irrigation as-builts. "If you're installing a new irrigation system, there's no better time than now to be watching what's hit, where it's hit, and making records of that," Rogers said. "You can hire a rotor-roooter company who can go down with a lens and track

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## Every year, without fail, drainage should be added somewhere

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age," said course architect Jan Beljan of Fazio Golf Course Designers, Inc. in Jupiter, Fla. "It's like work around your house. You build a house and think you're all done. But you're not done, you're never done."

Maintenance equipment and golf cars can create ruts and "when you've created ruts you've created an impounding area," she said. "Then you have compaction and you have to add drainage."

Then there's the turf itself. "Once you get a good, established turf that people are playing on, it gets tight enough on top that water is hindered as far as its ability to go through the soil," Mitchell said. "So it is easy to see it laying on top in wet areas. The same half-inch of rain that last year went right through the ground, this year will stand on top for awhile before it soaks in."

"Everything is tied into water management, i.e. drainage," said

Terry Buchen, superintendent at Double Eagle Club in Galena, Ohio. "It's the most important thing we do. Grass must not be too wet or too dry. You can have a \$50 million irrigation system, but if you don't have drainage, it's not going to be right."

Then why not install enough drainage to begin with?

"Undoubtedly, when a course is built, architects will give some consideration to drainage," Mitchell said. "But when it

comes to nickels and dimes, something has to suffer. And, unfortunately, it's drainage."

Referring to Greenbriar's croquet courts, where he installed drainage tiles in 15-foot and 12-foot centers, Mitchell said: "But we don't do those things on tees and fairways. If you ask, 'Can we afford it?' you have to analyze what it costs you to have the course wet — how many times you have to reseed, how many ruts you make in the ground

when carts go over wet areas... "So I don't know that we can afford to put drainage on fairways on 12-, or 15-, or 20-foot centers like we do on greens. But certainly we can afford to do a lot more than is being done, and offset that cost by what we would otherwise pay in rectifying the problems."

A major factor in the problem of drainage is that nobody really knows what is happening beneath the surface of a golf course — or in your own backyard.

"We have no science where anyone can figure it out," said Jim Kirchdorfer, president of Irrigation Supply Co. and of the Golf Course Builders Association of America. "A lot of the time the original topographical maps for golf courses aren't correct... Plus, you're dealing with nature. You're changing the flow of water and where it pockets and settles, and you're putting grass on it... It might be different soils, irrigation patterns, water from a subdivision.

"You move soil and water bleeds out of a different area."

"Springs come up, plates shift," agreed Rogers. "Your soil structures are changing when you do massive dirt movement. Then you apply irrigation and you have the complexity of the soil makeup itself. You're going to have some change. It's not uncommon that you will ultimately double whatever the engineer has planned for drainage when the course is constructed..."

"Mountains are a whole new breed. You can easily triple it there."

Ultimately, said Mitchell, "No matter how much drainage you put in, you're still going to be short-sighted in some places. You could analyze the soil type, and couple that with the elevation changes, and by that someone who really knows drainage might be able to put a good system in a new golf course. It's possible. But I don't think it is being done."

### Drainage tips

Continued from previous page and trace where your drains are."

- Find out where existing drainage is and if it is feasible to tie into the main lines. If elevation is such that water will not drain, the superintendent may have to run electricity out and install sump pumps.

- Install still wells, digging pits and filling them with gravel for the water to drain to.

- Add channel drains to areas compacted by vehicles entering and exiting cart paths.

- Use the oval-shaped ADS. Grass above a drain tile often turns brown because the soil drains so well. This pipe requires a narrower cut. Instead of a 6-inch trench, this elongated pipe requires only a 3- or 4-inch trench and therefore less grass to grow over it.

- Use lighter-weight equipment, which doesn't cause as much harm.

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