

GOLF COURSE CONSTRUCTION: GROW-IN PHILOSOPHIES

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ONE OF THE MOST specialized and least understood challenges ever faced by a golf course superintendent is overseeing the construction and subsequent grow-in of a new golf course. In this unique area of turfgrass management, there is a lot of art to go along with the science.

The Double Eagle Club in Galena, Ohio (north of Columbus), was designed by Jay Morrish and Tom Weiskopf. It was constructed by the Wadsworth Golf Construction Company of Plainfield, Illinois, using cool-season grasses. Double Eagle was grown-in during 1991 and opened for play in 1992. In the following article I would like to share some of the trials and tribulations of being an owner's representative and golf course superintendent at the Double Eagle Club, as well as discuss points experienced from the grow-in of 10 other golf courses.

Overview

It is safe to say that:

1. After the initial seeding and when the sprinklers are turned on for the first watering, the most critical time during grow-in is the *first three weeks!*
2. Growing-in newly planted turf will require *up to 10 times* more fertilization (for a limited period of time) than an existing golf course practicing routine maintenance.
3. Preventative fungicide applications should be applied at higher rates, with shorter intervals between applications, as recommended by the pesticide label.
4. The common goal of the owner, architect, contractor, and superintendent always is to grow-in the turf with minimal soil erosion as fast as agronomically possible.

The grow-in budget usually is the determining factor.

Fairways

Penntrio creeping bentgrass was planted at 2 pounds pure live seed (PLS) per 1,000 square feet with a Brillion Turf-Maker Seeder. The soil physical analysis indicated a silt loam composition for the 6- to 8-inch depth of topsoil. Soil nutrient tests revealed deficiencies in N-P-K, a soil pH range of 6 to 7, and acceptable minor nutrient levels. Atrazine levels were checked, even though the property had not been farmed in eight years, and minimal amounts were detected. After experimenting with high rates of N-P-K during prior grow-ins, we decided to go with Scott's Pro-Turf fertilizer, a homogeneous product that is safe for young turf.

Grassing of the practice area early allowed the membership to hit balls while waiting for the course to open for initial play.



Our goals and concerns were:

1. A heavy pre-plant fertilizer application was needed because of the frequent irrigation cycles used. In addition, granular Subdue also was applied to control damping-off.

2. My experience has been that fertigation should be used only as a supplement to a granular fertilizer program, especially during periods of excessive rainfall and/or cool temperatures when the sprinklers are not used very often.

3. The heavy, granular pre-plant fertilizer application was sufficient to last for the *first three weeks*. After this period, the irrigation cycle was "backed off," allowing for additional granular applications to keep the grow-in proceeding at a fast pace. We then initiated a granular fertilizer program with a push-type rotary spreader. Once the turf was far enough along and the soil firm enough, a truckster/tractor-mounted spreader was used, usually after the three- to five-week period and beyond.

4. A second Subdue granular preventative fungicide application usually was made during the initial three-week period, using push-type rotary spreaders. The soil and turf were too soft and weak to allow any type of heavy spray equipment. All subsequent preventative spray applications were made with a walk-behind spray boom or truckster-mounted 100-gallon sprayer with a rear-mounted boom.

5. All sloped areas were straw mulched, with the material blown into place and then "crimped" in with tractor-drawn and push-type crimper implements.

The new turf was mowed with a light-weight triplex utility unit for the first few mowings, using solid rollers front and rear. Mowing was done in the afternoons *only*, and the clippings were not collected. After the first few mowings, a five-plex mower, with solid rollers front and rear, was used with the grass catchers. In catching the clippings early on, the golf course was kept firm, with a minimum amount of thatch present. In this case, a fairway topdressing program was initiated from the start. The solid rollers, both front and rear, were changed to the Whiele rollers as soon as the turf was knitted-in and matured enough.

In my opinion, one of the many "secrets" to a successful grow-in is the timing of the first mowing. Allow the grass blades to "leaf-out" to the two- to three-leaf stage before initiating the very first cut. If the new turf is cut too short on the first mowing, the new grass will be severely set back.

Roughs

Roughs were seeded with a blend of bluegrass, perennial ryegrass, and fine fescue at 4 pounds PLS per 1,000 square feet and

fertilized similarly to the fairway program. No preventative fungicide program was needed. Seed germination was earlier than normal due to the extra nutrient boost, and the new turf was successfully established. Sod was used around all sand bunkers adjacent to fairways, greenside bunkers, one to five strips around each tee, and where needed around green banks. For easier access, the new sod, which closely matched the seed specs, was not initially mowed until three weeks after seeding when the water was backed off.

The roughs were fertilized and straw mulched similarly to the fairways, and the water was decreased at the same time. All new sod was mown with rotary mowers with grass catchers and then raked to collect extra clippings. Self-propelled rotaries were used until the seeded turf was sufficiently rooted to handle riding equipment.

Greens

The greens were seeded in two directions with a drop seeder using Pennlinks creeping bentgrass at 2 pounds PLS per 1,000 square feet. A riding sand bunker rake with knobby tires was driven over the surface to compact and firm the seedbed. The depressions from the tires help keep moisture in the soil longer and do not have any long-term effects on the smoothness of the green. The depressions flatten out over time from irrigation, rainfall, and the rolling action of the mowers, and they totally disappear after the first heavy topdressing. It is amazing how much seed germinates in the tire depressions!

The root zone mixture was 85% sand and 15% Canadian sphagnum peat moss. An intermediate layer was not needed after thorough testing of all subgrade materials. It is always a good idea to run a nutrient soil test of the root zone mix. Initial nutrient levels of the seedbed mixture indicated N-P-K levels were deficient and many minor nutrients also were low. Nutrient levels were initially corrected with Scott's STEP granular material, and another application was made during the 10th week after initial seeding.

Beginning with the third week, we used "The Sandwich" method of grow-in whereby the turf was topdressed each week to bring the turf level *up*, and the mowers were subsequently lowered each week to bring the turf level *down*.

The greens were much easier to fertilize in comparison with the fairways and roughs, as cart paths were nearby and the greens did not footprint appreciably because of the 15 inches per hour initial infiltration rate. Preventative fungicide applications were similar to the fairways, utilizing granular products for the first two applications.



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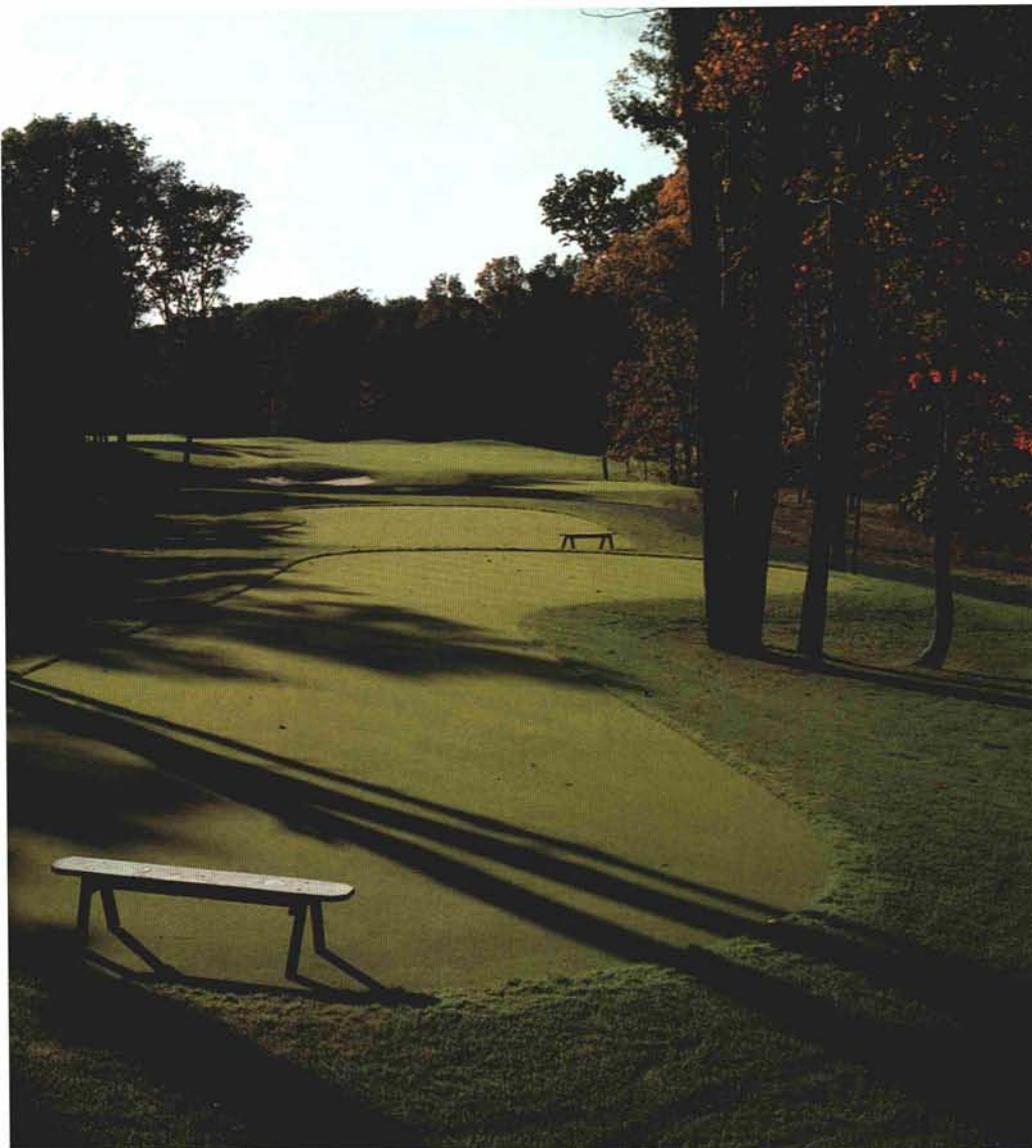
Tees

Penncross creeping bentgrass was seeded at 2 pounds PLS per 1,000 square feet similarly to the greens. The root zone mix was the same as the greens, but was at a depth of six inches. No subgrade gravel or drainage tile was used since the subsurface of the soil was sloped 2% to the rear. The root zone mix was graded perfectly level for what we felt were ideal playing conditions. [Editor's note: We sometimes see tees constructed with a slight front-to-back slope.] Fertilization, pesticide applications, and topdressing programs were similar to greens.

Some Thoughts for a Successful Grow-in

Fertilization

The first three weeks of heavy watering makes it very difficult to fertilize greens,



Even with the utmost in precautionary measures, some trees may die along golf holes for up to five years after initial construction.

tees, and especially fairways and roughs. Use a safe, homogeneous fertilizer product that is a proven winner and that you are *personally familiar with*. You must know how it will release the major nutrients. Trying to test unfamiliar or unproven products during grow-in is very difficult and risky at best. Fertigation works as a supplement to granular fertilizers.

Keep the phosphorus and potassium levels high to promote top growth and root development and to help prevent disease. During the initial 10- to 12-week period, determine when to begin a routine maintenance fertilizer schedule. The heavy fertilizer applications during the rapid grow-in period can be overdone, causing excessive thatch. Micronutrients should be added during the initial seeding using a granular material to guard against excessive leaching, especially on sand-based greens and tees. (*Remember, grow-in fertilization is just the opposite of routine maintenance!*)

Fungicides

The initial fungicide application prior to turning on the sprinklers for the first time *must* be a *granular* systemic fungicide. In my opinion, using a liquid and spraying bare soil is not very effective. A second application of the same product should be made two to three weeks later, usually when the turf is well established and after decreasing the frequent irrigation cycles. All subsequent pesticide applications can be sprayed, as the turf usually can handle the weight and traffic of a 100-gallon truckster-mounted boom sprayer on the fairways and a walk-behind boom on greens and tees. Using treated grass seed does help, but the granular fungicide program must be used. This is the only product formulation that can withstand the frequent irrigation and lush turf growth.

Pythium/damping-off is the main disease of concern with the high fertilizer rates. I have always used my "gut feeling" regarding

preventative broad-spectrum fungicide applications and have *never* used them until after the three- to four-week period. There never seems to be any reason to justify their use in the early stages of grass development. If you feel that a broad spectrum systemic/contact fungicide is needed, be careful. Some granular fungicides of this nature are not safe for use on newly planted turf.

Watering Practices

Watering only during the daylight hours works best. "Wake up the new turf with a drink in the morning, and put it to bed with water at dusk." This old saying is so very true. A good rule-of-thumb is to water every two to three hours with one to three turns of the sprinkler head during each cycle. The biggest mistakes made during grow-in are with watering practices, where the soil is not kept wet enough due to concerns about erosion. To properly water a new seedbed, a small amount of erosion usually occurs.

Once the seed is wet for the first time, *it cannot be allowed to dry out even for the shortest period of time*. It is best to water *only* with individual field controllers. One person should water semi-automatically on a few holes and watch for over-watering and under-watering, and turn off stuck sprinkler heads immediately. Except for initial testing, do not use the master irrigation controller for any type of watering during grow-in. A person must be there to properly monitor the soil and turf.

Irrigation System Testing

Flush and test each sprinkler and all piping for as long as is practical to help eliminate sprinkler head malfunctions. Most leaks and stuck sprinkler heads can be eliminated by flushing during installation and once again before grassing begins.

Mulching

The best results with grassing have been witnessed when fairways and roughs are mulched with hay or straw, depending on what is locally available, to keep the soil moist and to help guard against unnecessary soil erosion. The mulch should not be spread so thick that the new turf is smothered. It should be "tucked" in with a tractor and hand-operated devices. Talk to the local supplier about possible weed seed contamination in the straw; the cleaner, the better.

Preemergent Herbicides

Consider using Siduron preemergent herbicide, with a starter-type fertilizer as the carrier, on the bentgrass fairways. I have seen anywhere from fair to excellent results achieved for a two- to three-week period against weed seed germination. Do not be



Proper fertilization, preventative fungicide applications, proper water cycles, and mulching of slopes are critical for a successful grow-in.

alarmed if annual weeds germinate after the Siduron wears off. The desired turf will be strong enough to compete against the weeds, and the weeds can be sprayed out easily after the turf is established.

Equipment

Again, stay with proven winners as it pertains to any equipment purchases for the grow-in. I always have purchased equipment I was personally familiar with because malfunctions can be disastrous. I have used “demos” of unfamiliar equipment, but it is difficult, at best, to spend much time evaluating the equipment. Grow-in is a very busy time.

Take extra precautions against the construction dust. Air filters on all equipment should be cleaned and checked many times throughout the day. Also, change engine oil frequently.

Mowing

For the first mowing, let the grass blades “leaf out” by letting the turf grow about

50% higher than the desired first mowing height. Always use solid rollers, front and rear, until the turf is established. The grass blades should be at least in the two- to three-leaf stage before the first cut is initiated. Grow-in is made particularly challenging by the many different mowing heights encountered at the same time as greens, tees, fairways, and roughs are in different stages of maturity. We label individual mowers with the machine’s precise mowing height to avoid confusion and costly mistakes.

Seeding Rates

Use the pure live seed (PLS) method for all seeding rates: $\text{Purity} \times \text{Germination} = \text{Pure Live Seed \%}$. Divide the PLS figure into the desired seeding rate to determine the actual seeding rate needed for 100% PLS. Work with the contractor to double check all seeding rates and equipment calibrations. If a different type of seed is used with any seeding equipment, blow the seeders out with air to avoid undesired seed contamination.

Bunkers

Consider installing the bunker sand and sodding around the bunkers at the same time, just prior to seedbed preparation. Coordination of hand-watering the sod is important to properly water the newly sodded turf without washing soil into the newly placed bunker sand. For ease of irrigation, install a quick-coupler valve next to all areas that are going to be sodded. Algae may appear on the surface of the bunker sand during the first three weeks of watering, but will disappear after the irrigation cycles are reduced.

Drainage Grates

Sodding around drainage grates, both in the fairways and the roughs, is recommended. The addition of hay or straw bales or a silt fence is an extra precautionary measure to keep the drains from becoming “silted over” with eroded soil. Straw mulch placed away from the catch basins will further ensure better results.

Construction Progress

The last 5% of the construction phase is the busiest time. On average, up to one hole a day can be totally finished and turned over to the superintendent for his/her grow-in expertise. Have all equipment, materials, chemicals, and fertilizers on hand well before each hole is completed.

Teamwork

The owner, architect, contractor, and superintendent must all work as a team to achieve the desired objective — the opening of the new course. Leave your ego at home and communicate and help each other out during the busy times, especially during irrigation testing and subsequent grassing. Strive for a good, professional relationship *before* and *after* the construction is completed, and you will sleep better at night.

Summary

The fascination of the game of golf is that no two courses are alike. This holds true for building and growing-in a new golf course as well as playing the game. In this article I’ve attempted to detail a number of the techniques used to grow-in golf courses with which I have been associated. Obviously, there are other ways to do things. Nonetheless, I hope this article helps the turfgrass manager with one of the greatest and most rewarding challenges in our profession.