



Building greens the right way helps keep the course beautiful.

Building Greens The Wrong Way Is Not Right

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ABOUT A YEAR and a half ago the GREEN SECTION RECORD carried the article "Building Greens The Right Way; It's Easier Than You Think." Tulsa Country Club superintendent Harold Neal described how his club took steps to insure five new greens were built exactly according to USGA Specifications. Unfortunately, this kind of dedication is not always practiced. Many memberships believe their greens are "Specification Greens," but after close investigation, they often find the construction procedure was modified by someone in some manner. The modifications most frequently include:

1. The deletion of the two-inch coarse sand layer.
2. Deletion of the four-inch gravel base.
3. Deletion of the fumigation process.
4. On-site mixing of the soil components.
5. Complete elimination or excessive spacing of the drain tile.
6. Improperly sized material, including excessive percentages of fine sand, silt, clay, or organic matter.
7. Improper organic matter that breaks down and forms nearly impervious barriers.

Recently the Turf Advisory Service visited a relatively new golf club in Colorado where the most-often-found modification — on-site mixing — has made the maintenance of good turf difficult, and at times impossible. On-site mixing is the most-often-made mistake concerning construction of USGA greens. It is easy to delude oneself and believe mixing materials on the green surface with a roto-tiller is just as good as off-site mixing with a soil blending process. It isn't true. Architects and contractors often mention cost savings to the club as the justification for on-site mixing. In reality, they should



(Above left) Each season, poor internal drainage made the greens very difficult to manage.

(Above right) Excavating revealed a rootzone that suggested on-site mixing — note the concentration of the organic matter in the upper six inches.

(Right) Profiles from different parts of the same green revealed totally different rootzones.

(Opposite page) Photos from nine years earlier proving on-site mixing was practiced.



be concerned with building the green properly, as specified.

There are significant agronomic disadvantages to on-site mixing. As most are aware, the key principle of the USGA green is the perched water table. Water will not move from the topmix into the underlying coarse sand layer and subsequently into the gravel drainage blanket below until each successive layer reaches field capacity (all available pore spaces filled). Once field capacity is reached, the drainage process begins, and excess moisture is drained from the root zone.

Obviously, any additional layers throughout the profile will create additional perched water tables and decrease the infiltration rate through the profile. It therefore becomes critical that the topmix is homogeneous throughout its depth.

On-site mixing cannot achieve this goal. An operator using a tiller must exercise great care not to allow the tiller to dig into the underlying coarse sand or gravel blanket. Compounding this difficulty, many contractors create undulations in a green with the topmix

rather than with the subgrade. This leads to great variances in the depth of the mix. Not only does this adversely affect the movement of water through the profile, but also the tiller operator tends to keep the machine very high to avoid penetrating the shallow areas of the mix.

Before building a green, individual samples of the sand, soil, and organic matter that are to comprise the final topmix must be submitted to a soils laboratory for analysis. The lab will determine the percentage of each component necessary to achieve the time-tested USGA specifications. If the goal is an 85/15 ratio of sand to organic matter, the only way to achieve these proportions throughout the depth of the mix is to mix off-site. Even then, it is recommended that a sample, following mixing, be again submitted to the lab to insure proper proportions.

The accompanying photographs of the construction process at the Colorado golf course depict both the on-site mixing and the results that occurred a few years later. In this case, combining on-site mixing with sand that exceeds USGA

percentages of very fine sand, silt, and clay has resulted in greens that simply will not drain. Tests by Agri-Systems of Texas laboratory revealed that the infiltration rate was practically zero. The very expensive process of building these greens will have to be repeated before they will provide the type of putting surface one should expect throughout the season.

On-site mixing is neither a money saver nor a budget buster. It really proves tremendously expensive if it becomes necessary to rebuild all the greens after just a season or two. If you are the superintendent at such a course, the expense may be the least of your worries. As Harold Neal's article indicates, building greens the right way *is* easier than you think. It is best for your club and your program. Building greens the wrong way is dangerous to your reputation. There is an old saying concerning airplanes: "If it's flying right, don't run out and try to fix it." It applies to building greens as well. The USGA specifications have stood the test of time. Why gamble with someone else's modifications?

