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Green Section
RESEARCH YOU SHOULD KNOW
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Using subsurface drip irrigation on small tees can deliver similar turf quality to overhead sprinklers while using much less water.

SUBSURFACE DRIP IRRIGATION

REDUCES WATER USE ON TEES

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- Efficient water use is important to superintendents.
- Precisely irrigating small or isolated tees is challenging with traditional sprinklers.
- New Mexico State University scientists evaluated four subsurface drip irrigation systems on tees. Each provided similar turf quality with three to five times less water than traditional sprinklers.

Water conservation is a primary concern for superintendents, especially those in regions with limited rainfall. Many strategies and technologies are used to conserve water, but each can only be as efficient as the irrigation system allows. For example, irrigation systems without separate zones for putting greens or tees and their immediate surrounds don't account for the often vastly different irrigation requirements of these areas. Even systems with separate zones cannot perfectly irrigate only the surface intended.

Consequently, irrigation uniformity often is improved with hand watering – a practice that is routine even for golf courses with advanced irrigation systems. However, as New Mexico State University scientists have shown, subsurface drip irrigation also is a viable tool to improve irrigation precision, especially for isolated tees where irrigation overthrow is not desirable in the immediate surrounds.

Beginning in May 2016, researchers installed subsurface drip irrigation systems from four manufacturers at the Club at Las Campanas in Santa Fe, New Mexico. The systems were installed on small, championship teeing grounds with sand-based rootzones, then compared to "control" tees that were irrigated with the existing overhead sprinklers. Tee surrounds were unirrigated except for overspray from sprinklers on the control tees, which was included in water use calculations.

Drip irrigation lines were installed at a depth of 4 inches with 9- or 12-inch spacing between drip lines. Researchers used a trencher to install the drip lines either 1) by trenching through the existing creeping bentgrass turf or 2) after removing the creeping bentgrass sod from the tee surface. Sod was replaced after the latter installation scenario, and the teeing grounds in both scenarios were topdressed and irrigated with existing overhead sprinklers to complete the installation. All tees were under a typical management regime for the region, except that aeration was withheld to avoid potential damage to subsurface drip irrigation components.

Post-installation recovery was quickest when sod was removed before trenching, and there were no turfgrass quality or water use differences between the different drip line spacings. Further, there were no differences in turfgrass quality among tees irrigated with subsurface drip systems and the control tees that were irrigated with sprinklers – even though the control tees received three to five times more water because of overspray into the surrounds.

These results demonstrate the potential for water conservation by incorporating subsurface drip irrigation on golf courses, especially for small or isolated tees. However, subsurface components may be damaged during aeration or displaced with regular topdressing. These challenges deserve consideration but may not outweigh water conservation benefits.

References:

Leinauer, B., M. Serena, E. Sevostianova, B. Whitlark, J. Krause, and W. Egelhoff. 2018. Evaluating the performance of four subsurface drip irrigation systems used on creeping bentgrass tee boxes at the Las Campanas Golf Course (Santa Fe, NM). 2017 USGA Turfgrass and Environmental Research Summaries. pp. 361-367.

USGA Video – Research you should know: A new way to irrigate tees

