How Much Water Is Needed To Flush a USGA Putting Green?

By John Daniels, agronomist, Central Region | June 16, 2017

Periodic flushing of putting green root zones is necessary for golf courses using irrigation water with high concentrations of dissolved

Salt buildup in root zones poses a serious threat to turfgrass health. In soils with high permeability and good drainage, such as a USGA putting green, excess salts can be leached out of the root zone with heavy irrigation. Routine testing with a portable salinity meter will help determine when leaching is necessary and a soil test will recommend if any amendments are needed. However, many turf managers do not fully appreciate the volume of water required to flush salts from putting green root zones.

Consider the following example:

A 12-inch deep root zone that conforms to USGA recommendations and has 20 percent air-filled porosity would require 200 cubic feet of water per 1,000 square feet to become saturated. This is equivalent to 1,496 gallons of water per 1,000 square feet. If a golf course has 3.2 acres of putting greens, it would require 208,530 gallons to flush all putting green root zones. In other words, 2.4 inches of water would be needed across the putting surfaces to reach saturation.

If a putting green is 5,000 square feet and has four sprinkler heads, each with an output of 24 gallons per minute, the sprinklers would need to run for 78 minutes to deliver the amount of water needed to flush the root zone. If the sprinklers on the putting green have a distribution uniformity of 75 percent, the runtime would have to be increased to 104 minutes in order to achieve the needed 2.4 inches of water across the putting surface. Keep in mind that limitations in irrigation system flow as well as the infiltration rate may necessitate a cycle-soak program to effectively deliver this amount of water.

Note that these values are only an example; the actual volume of water needed to saturate a soil profile will vary from course to course. Furthermore, additional water may be necessary to move harmful salts completely through the profile. Monitor the drainage outfall to confirm whether or not enough water has been applied to flush a given putting green. When the electrical conductivity of the drainage water is similar to the irrigation water, leaching has been successful. Many courses find it necessary to irrigate over two consecutive nights to apply enough water to get the desired leaching effect.

Golf courses using irrigation water with minimal amounts of soluble salts and those in climates with ample rainfall may never need to flush their putting greens. Conversely, facilities using recycled water sources and those in arid climates often need to include periodic flushing as part of their irrigation management.

The article, "Flushing Greens: More Than Just Heavy Watering," provides detailed information about flushing putting greens and additional tips for success. For more information about managing salinity at your facility, contact your local USGA agronomist.

Central Region Agronomists:

Bob Vavrek, regional director – bvavrek@usga.org

John Daniels, agronomist – jdaniels@usga.org

Zach Nicoludis, agronomist – znicoludis@usga.org

Information on the USGA's Course Consulting Service

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