Syringing: an essential practice or a waste of time?
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Many consider syringing turf, especially putting greens, and essential management practice to ensure survival when air temperature exceeds 90°F. Syringing is the process of applying a small amount of water to the turf during mid-day; generally less than a \( \frac{1}{10} \) inch. When done properly, little if any of the water reaches the soil. The goal is to cool the turf during periods of intense heat stress, but does this common practice actually help?

Plants cool themselves by transpiring water through holes on their leaves (stomata). These stomata open and close depending on the plant’s water status. In well-watered plants, heat energy from the leaves is used to evaporate water during transpiration and canopy temperature is reduced. The same thing happens when people sweat. It’s an efficient cooling mechanism; still 98% of the water used by cool-season turf is used for cooling. Evaporative cooling stops when plant leaves lose access to water. This occurs when the soil is dry, the roots are compromised (root disease, high soil heat or saturated soil) or when evaporative demand very high and the plants roots can’t keep up (high temps and very low dew points). Cooling also slows when the humidity is very high. Under these conditions, canopy temperatures can quickly exceed lethal levels.

So, does syringing help? Unfortunately, the answer is most typically no. The plants are already transpiring and therefore cooling via normal transpiration. Adding small amounts of water only temporally cools the surface (Figs 1-4), and that only happens when humidity it low. This has been confirmed by researchers over three decades in North Carolina and Alabama. DiPaola (1984), Peacock and Bennett (1996) and Guertal et al. (2005) found syringing reduced canopy temperature a few degrees for a very short time (minutes). These bentgrass greens did not show any symptoms of drought stress during the experiments. Guertal et al. (2005) also reported that syringing increased soil temperature at \( \frac{1}{2} \)” depth. It’s not compelling evidence to support syringing well-watered turf. When the dew point is high and wind speed is low, the humidity just above the turf can be near 100%. This slows evaporation and limits the potential for cooling. A proven way to cool the turf canopy is to increase transpiration rate with air movement. Maximize air flow with tree pruning and use turf fans in protected areas. Consider temporary (movable) fans that can be easily removed when the weather improves.

Syringing can still be important under certain conditions. It reduces temperature when the turf has reduced access to water for transpiration and nears or displays wilt; very shallow root system (i.e. annual bluegrass in midsummer) or when roots are compromised by disease or poor soil conditions (i.e. wet soils this spring). It can also help during wet-wilt which is more likely to occur in western Nebraska. During wet-wilt, evaporation exceeds the plant’s ability to extract water from the soil. This causes the leaves to wilt and the canopy temperature to rise. Remember, the effect of syringing doesn’t last very long. Monitor canopy temperature with an infrared thermometer to decide when syringing is required.

To maximize turf health during summer, irrigate to the depth of the turf root in early morning. Transpiration is usually sufficient to cool the turf. However, turf with visible drought symptoms can rapidly heat up, and syringing can help in this case. Generally, syringing provides more piece of mind than long-term cooling, especially during high humidity. Be sure the extra effort is worth the resources.

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Figure 1. A creeping bentgrass fairway plot 7/13 at 9:49 am. Average temperatures in the boxes on right and left were 95.7 and 95.8°F.

Figure 2. A light syringing occurred at 9:50 am to the right half of the image. Notice the cool water stream going through the image.

Figure 3. Two minutes later at 9:52 am, the area that got syringed averaged 92°F while the area that wasn’t watered was still 95°F.

Figure 4. Finally, both plots were 101°F only seven minutes after the syringing application at 9:57 am. We’ll repeat this demo at field day on July 22nd.

References