

What's in dew? If I were to ask my sons this question, the answer would be caffeine. But for turf, it's the moisture that appears overnight on the turf leaf blade in the absence of rain or irrigation.

Dew forms when the leaf blade cools below the dew point (temperature at which moisture changes from a vapor to a liquid). Clear, cool nights with light wind are favorable for dew formation. Under these conditions, the radiative cooling from the leaf causes water condensation on the leaf. Besides the condensation of water vapor on the leaf blade, distillation or water from nearby leaves or soil contribute to dew. Water from condensation of water vapor and distillation are not distinguishable.

A third component of dew is guttation. Plant exudates or guttation appear through hydathodes or cuts in the leaf. Plant exudates are high in organic compounds like sugar and amino acids; water from condensation lacks these carbon compounds. Guttation droplets are distinguishable from water condensation because of their larger droplet size.

Dew forms at a theoretical maximum of about 0.08 mm per hour with a normal nightly accumulation of 0.3 mm to 0.5 mm (Garratt & Segal, 1988). Of the dew formed, approximately 33 percent is because of plant exudates or guttation as measured on a creeping bentgrass golf course fairway (Williams, et. al., 1998). Dew once removed early in the morning can re-accumulate with a higher proportion, 46 percent to 77 percent, comprised of plant exudates.

Agronomically, dew is important both positively and negatively. The presence of dew often is a sign of whether turf needs water. If dew is present, generally there is moisture present in the soil. However, in turf situations where dew is absent, this can indicate inadequate soil moisture, and watering during the day might be required.

Negatively, dew and associated wetting periods have been reported to influence disease severity. The duration of how long a leaf is wet, referred to as the wetting period, has influenced the severity of anthracnose (Danneberger, 1984).

The News on Dew Is Good and Bad

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Regarding dollar spot, reducing the dew period through early morning poling or mowing has reduced dollar spot severity (Williams, 1996). Although early-morning mowing increases the potential of wounding and thus more infection points, no difference in dollar spot specifically between mowing in the evening versus the morning has been cited (Williams, 1996). It appears the reduction in the duration of the dew period from an early-morning mowing is more significant than the wounding that might occur.

However, the impact of re-accumulation of dew following mowing or poling could be a factor in disease development due to the larger proportion of the dew being comprised of guttation water. The increased proportion of guttation water following initial removal can be qualitatively determined by striking a golf ball across a putting green following mowing or whipping. The ball picks up moisture and feels "sticky" if allowed to dry. The stickiness is due to the sugar from the guttation water. Often overlooked by golf course superintendents, early-morning golfers often attribute this stickiness to application of fertilizers or pesticides.

Research at Michigan State University has found that rolling after an early-morning mowing decreases dollar spot severity. The reason might be due to the fact that the greater proportion of plant exudates comprise the re-accumulated dew providing nutritional energy source for the fungus, and thus causing disease. Knocking off the re-accumulated dew by rolling reduces the sugars available and the dew period. It might make sense to lightly irrigate the putting green after mowing to dilute the re-accumulating dew or pole to enhance drying.

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