

# Due to DEW

Summer means overnight humidity, dew and disease pressure. Here are ways to prevent that morning moisture from destroying your turf. By Katie Tuttle

**A**s the summer weather starts to heat up, superintendents across the country are turning some of their focus to the turf diseases that come with the change in temperature and weather conditions; diseases such as dollar spot (*Sclerotinia homoeocarpa*) and brown patch (*Rhizoctonia solani*), which can be detrimental to the turf.

“All pathogenic fungi can facilitate themselves very well in moist conditions,” says Carmen Magro, Chief Agronomist at Agronomy Management Solutions. “Anytime there’s free moisture on the leaves, infections can take place as soon as there’s an opportunity for that infection to get in that plant.”

Because of this, it’s suggested that course superintendents

initiate a regular dew removal routine. There is plenty of research out there to support the idea that dew removal directly links to a potential decrease of diseases, such as dollar spot and brown patch. Because of this, it might be beneficial for superintendents to consider adding a dew removal program to their summer maintenance if they don’t already implement one.

There are multiple ways courses can remove dew from both the fairway and putting greens. The first is to use a surfactant. Another way is by syringing, or using a backpack sprayer with tap water to simulate irrigation. However, this may not be your best option.

“It seems kind of odd that you would remove water with water,” says Magro. “It’s not exactly environmentally the right



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This image illustrates a dew layer on a putting green. Notice how the dew encapsulates the entire leaf blade in many parts. This layer allows a medium for pathogenic fungi to move around, reproduce and lead to increased disease pressure on the underlying turfgrass.

“On warm nights, when we have cooler weather and dryer weather, we see less disease pressure because diseases mainly thrive in warm or hot weather with moist conditions,”

– says *Carmen Magro, Agronomy Management Solutions.*

thing to do.”

A third technique courses can use to remove dew is by dragging rubber hoses across the fairway and putting greens.

While some courses also mow, and it's actually recommended as a technique, Magro says this might not be a good idea either. His reason is that the blades of grass grow a waxy layer used to seal off wounds and protect the plant from diseases.

“When we mow it, we cut into that layer and we open up a channel to get into the vascular system of the plant,” he says. “If there's a lot of moisture on the leaves, and if there are pathogens floating around, it's an entry point for that pathogen.”

These four techniques were all tested in a 1993 study out of the University of Kentucky. The testing was to determine which technique had the least amount of moisture remaining after treatment, and which technique resulted in a reduction of dollar spot on the turf. Another technique used in the study was to roll large, sponge-covered rollers over the grass, similar to the rollers used to remove water from tennis courts. The assumption was that they would be just as effective in dew removal.

The almost two month study found that rolling and mowing were the most effective at removing the dew from the turf. Despite what Magro said about mowing, the study

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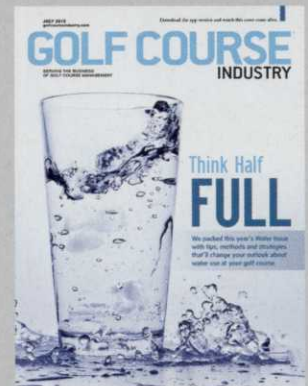
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also found that mowing the dew reduced dollar spot by 78 percent on the fairway and 43 percent on the putting green. On the putting green, the clippings were collected, whereas the clippings were returned on the fairway. The other four techniques tried also reduced dollar spot on the fairway, but not as significantly. On the putting green, the research didn't see a significant reduction in dollar spot from the other four techniques.

Of course, dollar spot as a result of dew also depends on the location of your golf course. A disease has to have an environment to thrive in, so if your course's envi-

ronment isn't ideal, you may not see this problem at all.

"On warm nights, when we have cooler weather and dryer weather, we see less disease pressure because diseases mainly thrive in warm or hot weather with moist conditions," says Magro. "[A course in Phoenix] could be growing the same creeping bentgrass that a course in New York is growing, but the same grasses will contract diseases in the eastern states that they'll never see out in Phoenix. It's not to say that you can't see them out there, it's just not as prevalent because the conditions aren't there for that



## MANAGING DEW: Key techniques

As mentioned in the article, there are many different ways that courses can remove dew from fairways and putting greens. Below is a list comprised of techniques mentioned by Carmen Magro, the study by the University of Kentucky, and the study by Delvalle, Landschoot, and Kaminski.

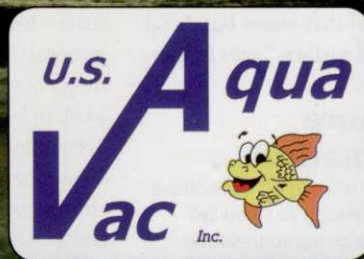
- Wetting agent – a nonionic surfactant was applied once per week during the experiments."
- Syringing – A backpack sprayer with tap water was used to simulate irrigation on these small plots."
- Dragging with hoses – Both the putting green and the fairway were dragged with a 3/8-inch-diameter rubber hose."
- Mowing – Clippings were collected on the putting green test but returned on the fairway test."
- Rolling – The plots were rolled with a sponge-covered roller to absorb leaf surface moisture. The roller drum was 24 inches in diameter and was covered with a 3/4 -inch-thick sponge, which was compressed at the top of the drum by a smaller solid roller to deposit the moisture into a catch pan in the interior of the drum."
- Dew was removed...by driving a Toro ReelMaster 5400-D across the dew removal treatment plots prior to mowing, with mowing units lowered and resting on the turf but reels disengaged."
- Going out and whipping off the dew with dew poles."

According to the University of Kentucky study, it might also be in your best interests to do a combination of these treatments on your course, such as dragging fairways with hoses or syringing early in the morning on the days that your staff doesn't mow.

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disease to grow."

It's not just dew that causes a problem. In fact, the largest problem is caused by guttation water, moisture which comes directly from the plant. Guttation water is the result of photosynthesis and contains a lot of sugars, which contains compounds that pathogens may use as nitrogen and carbon sources, causing bacteria and fungi to thrive. That's why it's beneficial to remove the dew before you mow, because it's not just plain, clean water.

"During [a plant's restoration period], the plant will exude, or release moisture through the leaves, through little pores in the leaves, and that water builds up on the leaf surface," says Magro.

### For more information...

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"The combination of that and dew adds a lot of moisture for diseases to facilitate themselves and these pathogens can reproduce and grow."

A 2010 study done by Tanner Delvalle, Peter Landschoot, Ph.D. and John Kaminski, Ph.D found that not only can dew removal decrease diseases, but it can also result in an improvement of your fungicide program. This information may make it more tempting for superintendents to take the time and money to increase dew removal on their course, especially if the improvement in your fungicide program could result in money saved.

According to the study, "results showed that daily dew removal and increasing mowing frequency from 2 to 6 days per week in late summer resulted in a reduction of dollar spot and improvement in the performance of chlorothalonil, propiconazole, and iprodione fungicides." However, it also stated that "Daily dew removal in late summer reduced dollar spot regardless of mowing frequency or fungicide products."

"From a disease management perspective, removing dew appears to be more cost effective than increasing mowing frequency," the study says.

Something for superintendents to consider is that dew removal doesn't just affect disease control.

"It's likely most superinten-

### Watch it

In this short video, the maintenance crew at Sun Valley's Trail Creek golf course, Sun Valley, Idaho, remove the dew from fairway No. 1 in preparation for a golf tournament. Using a specially prepared hose connected to the two vehicles the grounds workers drag each fairway to remove the thick dew.

Enter the [youtu.be/4eMmKFjgpAM](http://youtu.be/4eMmKFjgpAM) into your Web browser to watch the video now.

dents use this practice more for improving playing conditions (reduction in surface wetness) and dispersal of grass clippings and earthworm castings, than for disease suppression."

Another benefit could be an overall savings to the cost of your disease prevention programs, although the study states that it cannot guarantee that.

"Although results of this study do not provide enough information to establish a definite

economic benefit from dew removal practices, they do suggest that dollar spot severity can be reduced when daily dew removal is practiced on fungicide-treated turf...There is no guarantee this practice will pay for itself through a reduction in fungicide use, but it's likely you will have less dollar spot and improved playing conditions." **GCI**

Katie Tuttle is GCI's associate editor.



It's beneficial to remove the dew before you mow.