### CORNELL UNIVERSITY TURFGRASS TIMES



## An Aspirin a Day for Heat Stress?

As the summer months progress our cool season turfgrasses begin to experience typical signs of temperature induced decline. This decline is associated with depressed rates of photosynthesis (energy production) due to its inefficiency in fixing carbon at high temperatures into useful energy. However, heat stress produces a multifaceted stress response that involves a number of metabolic activities leading to cell death.

Researchers at Rutgers University have been exploring the heat stress phenomenon for several years and have identified a number of factors that will reduce overall stress. Recently, a study was conducted investigating the application of salicylic acid (SA), the active ingredient in aspirin, for improving heat tolerance of Kentucky bluegrass.

The researchers applied several rates of SA to bluegrass growing in a greenhouse and measured a number of physiological stress responses. They found that there were significant reductions in the amount of free oxygen radicals that indicate the reduction in stress response.

Oxidative damage is well known to be a key aspect of heat stress. Other products, such as cytokinin-based products including seaweedderived fertilizers, have also been shown in the Rutgers program to reduce injury associated with heat stress. More research is needed to validate the benefits of this approach under field conditions, but the mechanism for improving this stress tolerance appears to be well understood.

From: He, Y., et al. 2005. Effects of salicylic acid on heat tolerance associated with antioxidant metabolism in Kentucky bluegrass. Crop Sci: 45:988-995.

## **Air Cooled**

Heat stress and plant moisture management often includes regular light applications of water, often called syringing. Syringing is thought to provide temporary reductions in surface temperatures thereby alleviating the stress associated with drought and heat. In southern climates, where heat stress of cool season turfgrasses is orders of magnitude greater than in northern climes, fans for air movement are often used to reduce stress.

Researchers at Auburn University have been investigating the use of syringing and air movement as a means of reducing surface temperatures of creeping bentgrass putting greens. A two-year study was conducted in Auburn, AL investigating the effect of fans alone, syringing alone and fans plus syringing on a creeping bentgrass putting green.

Soil temperatures were reduced significantly by any treatment that included fan use. Syringing alone had little to no effect on soil temperature and in some cases was shown to decrease root length density. Fans plus syringing reduced the time the soil temperature was at or above the critical temperature for injury by two to three hours compared to no cooling or syringing alone.

The use of fans does not receive the attention it deserves as a means of improving heat stress tolerance and it appears, based on this study, that syringing is overrated. A comprehensive cooling program that incorporates watering and air movement will be critical during high temperature periods.

From: Guertal, E.A., et al. 2005. Fans and syringe application for cooling bentgrass greens. Crop Sci: 45: 245-250

# Scanning the Journals

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