

# Trinexapac-ethyl applications and growing degree days

*Doug Soldat, Ph.D., is an associate professor of turfgrass science at the University of Wisconsin-Madison. His research has focused on turfgrass and soil problems. He can be reached at [djsoldat@wisc.edu](mailto:djsoldat@wisc.edu).*

## **Q**How did you become interested in investigating the timing of trinexapac-ethyl applications on creeping bentgrass putting greens?

It was a convergence of two separate events. The first is that Bill Kreuser, the student who conducted this research, has a very inquisitive mind for all things turfgrass management. To give you an example, Bill built a USGA green in his parents' backyard when he was 14 and was always seeking ways to improve the green's performance.

The second is that Jeff Beasley, Ph.D., and Bruce Branham, Ph.D., had just published a scientific paper that determined that the rate of trinexapac-ethyl breakdown by turfgrass plants increased as temperature increased.

We coupled Bill's enthusiasm with the finding by Drs. Beasley and Branham and tried to figure out a better way to time applications of trinexapac-ethyl than using calendar date.

## **Q**What were the outcomes of Kreuser's research?

We examined trinexapac-ethyl applied to a creeping bentgrass green on 100, 200, 400 and 800 growing degree days (GDD) Celsius versus every 28 days. The data showed that trinexapac-ethyl applications made every 200 GDD Celsius provided the best turfgrass color and quality while effectively reducing clipping yield.

In Wisconsin, it takes roughly 7 days in summer and 21 to 28 days in spring

and fall to accumulate 200 GDD Celsius. The 200 GDD Celsius threshold was calculated with a base temperature of 0 degrees Celsius, which is equal to a 360 GDD Fahrenheit threshold with a 32 degrees Fahrenheit base.

A useful spreadsheet for calculating GDD for trinexapac-ethyl applications in both degrees Fahrenheit and Celsius can be found at [www://turf.wisc.edu](http://www://turf.wisc.edu) under the GDD maps section.

## **Q**What else have you found with this line of research?

The model of 200 GDD Celsius for trinexapac-ethyl applications works only for creeping bentgrass or a mixed stand of creeping bentgrass/annual bluegrass greens. Every grass species is affected by trinexapac a little differently and this model should only be used for creeping bentgrass/annual bluegrass greens.

We found that there were no differences among the creeping bentgrass cultivars we have worked with when applying trinexapac-ethyl at 200 GDD Celsius and that rootzone construction method did not impact creeping bentgrass response to trinexapac-ethyl applied at 200 GDD Celsius.

Doubling the rate of trinexapac-ethyl from 0.125 fluid ounces/1,000 sq. ft. to 0.250 fluid ounces/1,000 sq. ft. did not increase the application interval. The threshold of 200 GDD Celsius held whether the rate of application was 0.125 fluid ounces/1,000 sq. ft. or 0.250 fluid ounces/1,000 sq. ft.

## **Q**What has been the superintendent's response to the 200 GDD Celsius trinexapac-ethyl application threshold?

First, I think many superintendents

figured this out on their own prior to our research. Weekly trinexapac-ethyl applications at low rates have been widely used on creeping bentgrass greens. All we did was refine the application schedule and made it more scientific. Second, we have received positive feedback from superintendents across the U.S. and internationally on our application timing method.

## **Q**Anything else to add?

Our experience and research shows that trinexapac-ethyl applied at 200 GDD Celsius to creeping bentgrass and annual bluegrass putting greens will not result in increased annual bluegrass populations. While somewhat controversial, our preliminary research shows that applying trinexapac-ethyl to mixed stands of creeping bentgrass and annual bluegrass on greens will slightly reduce the annual bluegrass population.

The remaining annual bluegrass appears to stand out more, giving the impression of increased populations, but in fact, we find there is less annual bluegrass present.

We also found that by applying trinexapac-ethyl at a 200 GDD Celsius interval, 33 percent less nitrogen was removed from the system through clipping removal compared to an untreated green. If you start applying trinexapac-ethyl regularly, you can get away with a bit less nitrogen and maintain the same color and quality.



Clark Throssell, Ph.D., loves to talk turf. Contact him at [clarkthrossell@bresnan.net](mailto:clarkthrossell@bresnan.net).