



## Necrotic Ring Spot Resistance in Kentucky Bluegrass

by Doug Brede, Ph.D.

Necrotic ring spot is a serious disease for turfgrass sod producers. No one knows that fact better than the Thayer turf farm in Rathdrum, Idaho. The Thayer farm had been a fixture along the Rathdrum highway since the company was incorporated in 1966. At one point the business was so successful that George and his family even hosted a TPI/ASPA summer field day on their farm back in the early 1980's.

***"The most resistant Kentucky bluegrasses to NRS in the NTEP include Award and Beyond."***

But all that success began unraveling in the early 1990's as whispers circulated around local and regional landscape trade shows that the Thayer sod product was infested with what landscapers were calling "neurotic rings."

Necrotic ring spot (NRS) is a stealthy disease that can devastate a home lawn yet is usually invisible in the sod production field. It is a progressive disease that takes two years before its first symptoms appear. Sod farmers get the blame when customers see rings appearing on their sodded lawn, but their neighbors' seeded lawns are clear.

"NRS is the most destructive disease of Kentucky bluegrass in Colorado," notes Ned Tisserat, pathologist and professor at Colorado State Univ. *Continued p. 2*

***The amazing power of varietal resistance: A susceptible bluegrass on the left is riddled with NRS, while a resistant one is unaffected.***



## Winter Overseeding Trials on Jacklin Seed's Gly-Rye™

by Christian Baldwin, Ph.D.

Over the winter of 2011/12, we initiated research trials on seven golf courses in the Phoenix, AZ area, one in La Quinta, CA, and a trial in cooperation with Dr. Scott McElroy at Auburn University in Alabama. Managing all these research trials when you're based 2,000 miles away in Idaho is a daunting challenge and requires a tremendous amount of cooperation. Therefore, **a big thanks to each superintendent who planted these trials!**



***Paul McGinnis, golf course superintendent at Pebblecreek Golf Club overseeded his entire course with the Gly-Rye's. Pictured above is a par 3 hole on October 27, 2011***

All of the research sites were under maintenance similar to the rest of the golf course. Depending on the course, **Gly-Rye's** were planted either in the rough, fairway, or driving range tee box (See table). The objectives were to determine glyphosate rates for *Poa annua* control and timing of application for maximum **Gly-Rye** safety.

### **Auburn, Alabama results**

**December treatments:** December applications resulted in unacceptable injury. Research in Northern climates has also observed injury following an application in cold weather.

**January treatments:** Two applications three weeks apart at the 3.6oz/A rate provided *Continued p. 2*

### **Phoenix area cooperators**

Superintendent	Golf Course	Location (AZ)	Research Area
Paul McGinnis	Pebblecreek GC	Goodyear	Driving range tee
Mick Twitto	Whirlwind GC	Chandler	Driving range tee
Kenny Watkins	Firerock CC	Fountain Hills	Rough
Bill Kostas	CC at DC Ranch	Scottsdale	Rough
Mark Clark	Troon Golf and CC	Scottsdale	Driving range tee
Cory Wood	Legend Trail	Scottsdale	Fairway
Brad Bird	Desert Mtn Cochise	Scottsdale	Driving range tee

### NRS, continued

Around the world I have seen NRS symptoms in Japan and China, and Penn State professor Peter Landschoot has identified the fungus on plants collected in Italy and Sardinia.

### Identifying NRS

NRS starts as a single grass seedling infected by a thread from the *Ophiosphaerella korrae* fungus living in the soil. As the seedling grows, the fungus spreads along its roots, colonizing nearby plants. Once the infection reaches a diameter of about 4 to 6 inches, symptoms begin to appear – first as reddish-brown rings, and later as sunken dead patches. Symptoms commonly intensify in late July or August during periods of summer stress, forming the classic frog-eye tan ring with a green center.

Initially, the only thing visible above ground to tip you off to NRS is the occasional red leaf, which signals root problems below. Identification requires digging up plants at the edge of the dead grass and examining roots. Affected roots appear dark brown and covered with black fungal strands. Thatch in affected areas may decompose, giving rise to a sunken appearance.

Recovery from NRS requires a healthy fertility program, otherwise the rings seem to hang around forever. Slow-release products, like those featured in **BEST™** fertilizer, seem most effective according to recent research at Utah State Univ.

### Varietal resistance

As with many pests, crop rotation can help lessen the disease load in a turf production field. But make sure you rotate it to the *right* crop! Wheat, as it turns out, is an alternate host of the NRS fungus. That helps explain some of the problems encountered on the Thayer farm. When NRS was contracted, they rotated affected parcels into wheat and then back into grass. Unfortunately they didn't realize wheat was a secondary host.

Strike Three came when Thayer's choice of a grass variety was susceptible to NRS.

"I truly believe there is varietal resistance in Kentucky bluegrass," says Dick Smiley, professor at Oregon State University's Pendleton Station and a pioneering NRS pathologist. Smiley's trials showed broad differences among bluegrass varieties in resistance and susceptibility.

According to Massachusetts and Michigan data, the most resistant Kentucky bluegrasses to NRS in the 2000/05 NTEP include **Award** and **Beyond** ([www.ntep.org](http://www.ntep.org)). Other page-one varieties for NRS resistance are **EverGlade**, **Impact**, **Nu Destiny**, and **Rugby II**.

*This article is a condensation of one that appears in the May/June 2012 edition of TPI TurfNews.* 

### Overseeding, continued

100% *Poa annua* control, with less than 20% injury to the **Gly-Rye's**.

*February treatments:* Two applications at the highest application rate (28oz/A) resulted in less than 30% **Gly-Rye** injury. Keep in mind, this is 4 times the rate that we recommend. A single application at the lower rates provided marginal *Poa annua* control, while 2 applications at greater than 3.6oz/A provided season long control.

*Transition:* Regardless of treatment, no bermudagrass injury or spring green-up delays were noted.

### Phoenix results

*February treatments:* The 4oz/A rate did a poor job of killing *Poa*, however, there was suppression of seed-heads at this rate. The 8oz/A rate marginally controlled *Poa*, while the 16oz/A rate completely controlled *Poa*. No injury to the **Gly-Rye** was observed.

*March treatments:* *Poa* control was past its peak, even at the highest rate. This indicates timing is crucial for control. Applying glyphosate right before *Poa annua* flowers will result in excellent control. In the Phoenix area this year, *Poa annua* started to flower in mid-February. No injury to the **Gly-Rye's** was observed.

*February + March treatment:* At the 8oz/A rate, two applications spaced 4 weeks apart showed better *Poa* control compared to just one application. At the 16oz/A rate, nearly 100% *Poa* control was observed at both one and two applications. No **Gly-Rye** injury was observed following sequential applications.

*Transition:* Any impacts on transition will be noted in mid-June.

### Summary and recommendations

- ✓Glyphosate applied to the **Gly-Ryes** is an excellent post-emergence option for the late-season flush of *Poa*.
- ✓As noted in the Auburn University trial, late season glyphosate applications do not negatively impact bermudagrass spring transition.
- ✓Avoid glyphosate applications in November, December, and January above 4oz/A (4 lb./gal formulation), due to cold sensitivity.
- ✓The first glyphosate should be applied prior to *Poa annua* flowering.
- ✓If an 8oz/A rate is used it will require two applications one month apart to completely control *Poa*.
- ✓A single 16oz/A application rate provided season long *Poa annua* control.

### **Phoenix Area Field Day, May 1<sup>st</sup>, 2012**

For turfgrass managers in the Phoenix area, Jacklin Seed, in conjunction with Simplot Partners, will be hosting a field day, touring the research trials at the Country Club at DC Ranch, Troon Golf and Country Club, and Desert Mountain Cochise. For information, e-mail Dr. Baldwin prior to April 27 at [christian.baldwin@simplot.com](mailto:christian.baldwin@simplot.com)