

**Tenacity 4SC and Xonerate 70WDG in a
Spring-Summer Program for Selective *Poa
annua* Control (post-emergence) in
Kentucky Bluegrass Fairways**

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Why is *Poa* a problem?

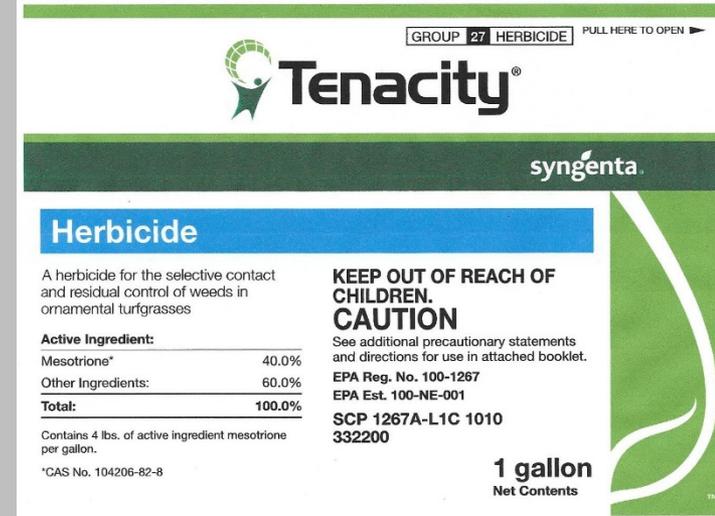
- Very competitive and over time can dominate a turfgrass stand
- Conspicuous
 - Splotchy turf (lighter green color)
 - Unsightly seedheads (mid-May through mid-June)
- Susceptible to environmental stresses
 - Heat/Cold
 - Drought
- Diseases
 - Anthracnose
 - Snow mold
- Prolific seed producer at low mowing heights
- One of the most common weeds in turf

Control Strategies

- Water management
 - deep and infrequent
- Reduce shade
- Remove clippings (remove seed)
- Growth regulators (inhibit growth or seedheads)
- Pre-emergence herbicides (late summer)
- Selective Post-emergence herbicides
 - ✓ Tenacity
 - ✓ Xonerate

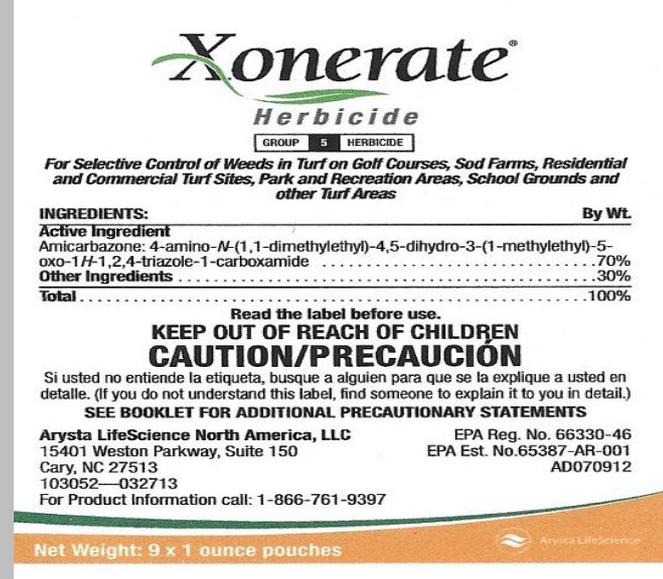
Tenacity 4SC

- Mesotrione
- Absorbed through roots and shoots.
- Unique mode of action: pigment inhibitor.
- Broadleaf and grass weeds and bentgrass.
- 4 – 8 fl oz/A. Limit 16 fl oz/A/year.
- Pre- and post-emergence (suppression) activity on *Poa annua*.



Xonerate 70WDG

- Amicarbazone
- Absorbed through roots and shoots.
- Mode of Action: PSII inhibitor.
- Broadleaf and grass weeds.
- Limit 10.25 oz/A/year.
- Do not apply to soils >7.4 pH.
- Do not apply to turf treated with mefluidide within previous 3 months.
- Do not apply to turf < 6 months old (12 months for KBG).
- Pre- and post-emergence activity on *Poa annua*.



Xonerate®
Herbicide
GROUP 5 HERBICIDE

For Selective Control of Weeds in Turf on Golf Courses, Sod Farms, Residential and Commercial Turf Sites, Park and Recreation Areas, School Grounds and other Turf Areas

INGREDIENTS: By Wt.

Active Ingredient	
Amicarbazone: 4-amino- <i>N</i> -(1,1-dimethylethyl)-4,5-dihydro-3-(1-methylethyl)-5-oxo-1 <i>H</i> -1,2,4-triazole-1-carboxamide	70%
Other Ingredients	30%
Total	100%

Read the label before use.
KEEP OUT OF REACH OF CHILDREN
CAUTION/PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)
SEE BOOKLET FOR ADDITIONAL PRECAUTIONARY STATEMENTS

Arysta LifeScience North America, LLC EPA Reg. No. 66330-46
15401 Weston Parkway, Suite 150 EPA Est. No. 65387-AR-001
Cary, NC 27513 AD070912
103052—032713
For Product Information call: 1-866-761-9397

Net Weight: 9 x 1 ounce pouches 

Study Treatments

Treatment ^a	fl oz or oz/A	Application date ^b 2013		
		May 2	May 23	June 13
1. Tenacity 4SC + Turflon Ester Ultra	5 fl oz + 16 fl oz	X	X	X
2. Tenacity 4SC + Trimmit 2SC	5 fl oz + 16 fl oz	X	X	X
3. Tenacity 4SC + Xonerate 70WDG	4 fl oz + 1 oz	X	X	X
4. Tenacity 4SC + Turflon + Trimmit	5 + 16 + 16	X	X	X
5. Tenacity 4SC + Xonerate 70WDG	5 fl oz + 2 oz	X	X	X
6. CHECK				

^aNIS (Activator 90) at 0.25% v/v included at each application.

^bApplication interval = 3 weeks

Location

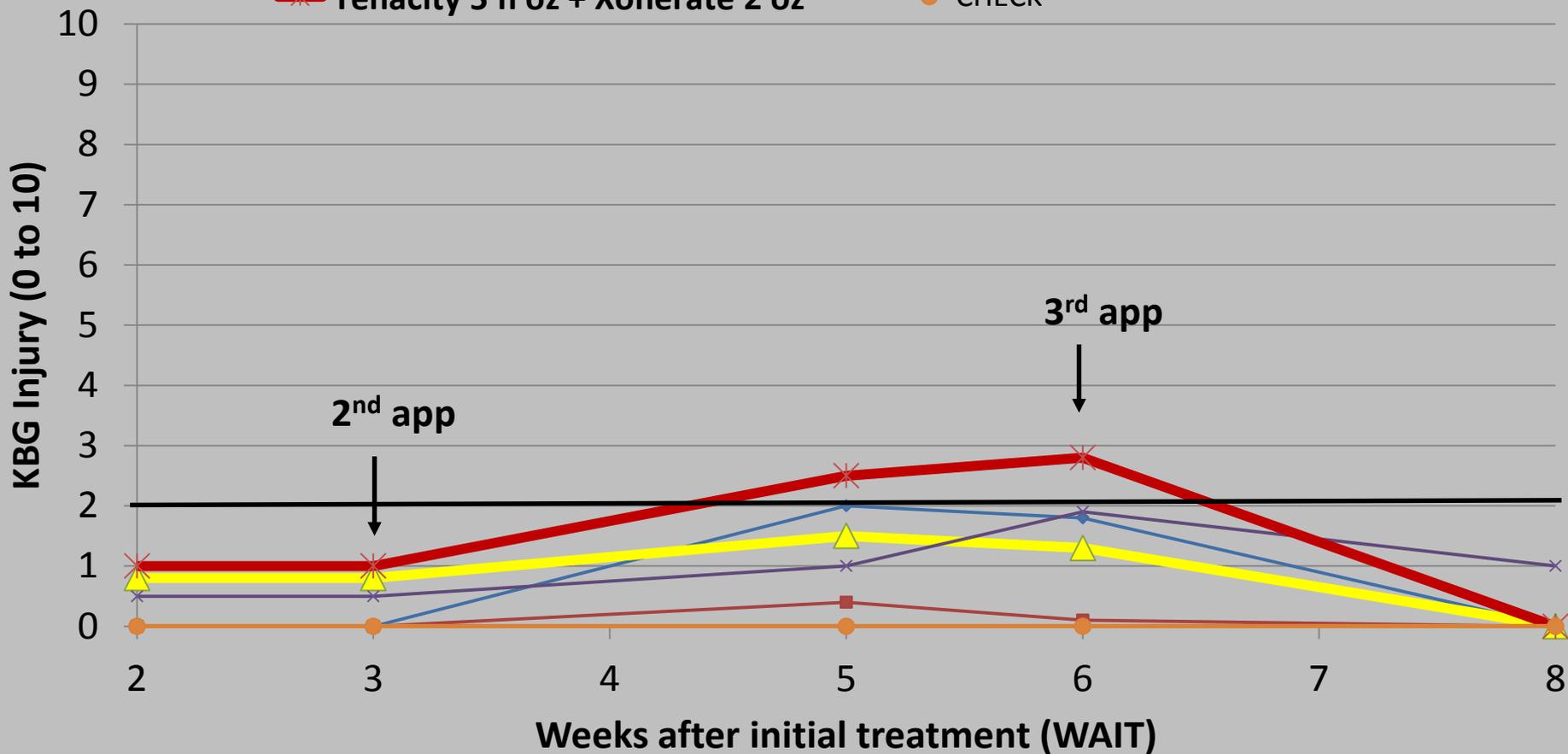
- Washington State University Palouse Ridge Golf Club (PRGC), Pullman, WA
- Kentucky bluegrass (KBG) fairway with 30 to 40% *Poa annua*

Objectives

- Assess Kentucky bluegrass and *Poa* injury
- Can Tenacity/Xonerate selectively eliminated *Poa annua* post-emergence?

Kentucky bluegrass injury

- Tenacity 5 + Turflon 16
- Tenacity 4 fl oz + Xonerate 1 oz
- Tenacity 5 fl oz + Xonerate 2 oz
- Tenacity 5 + Trimmer 16
- Ten + Turf + Trim 5 + 16 + 16
- CHECK

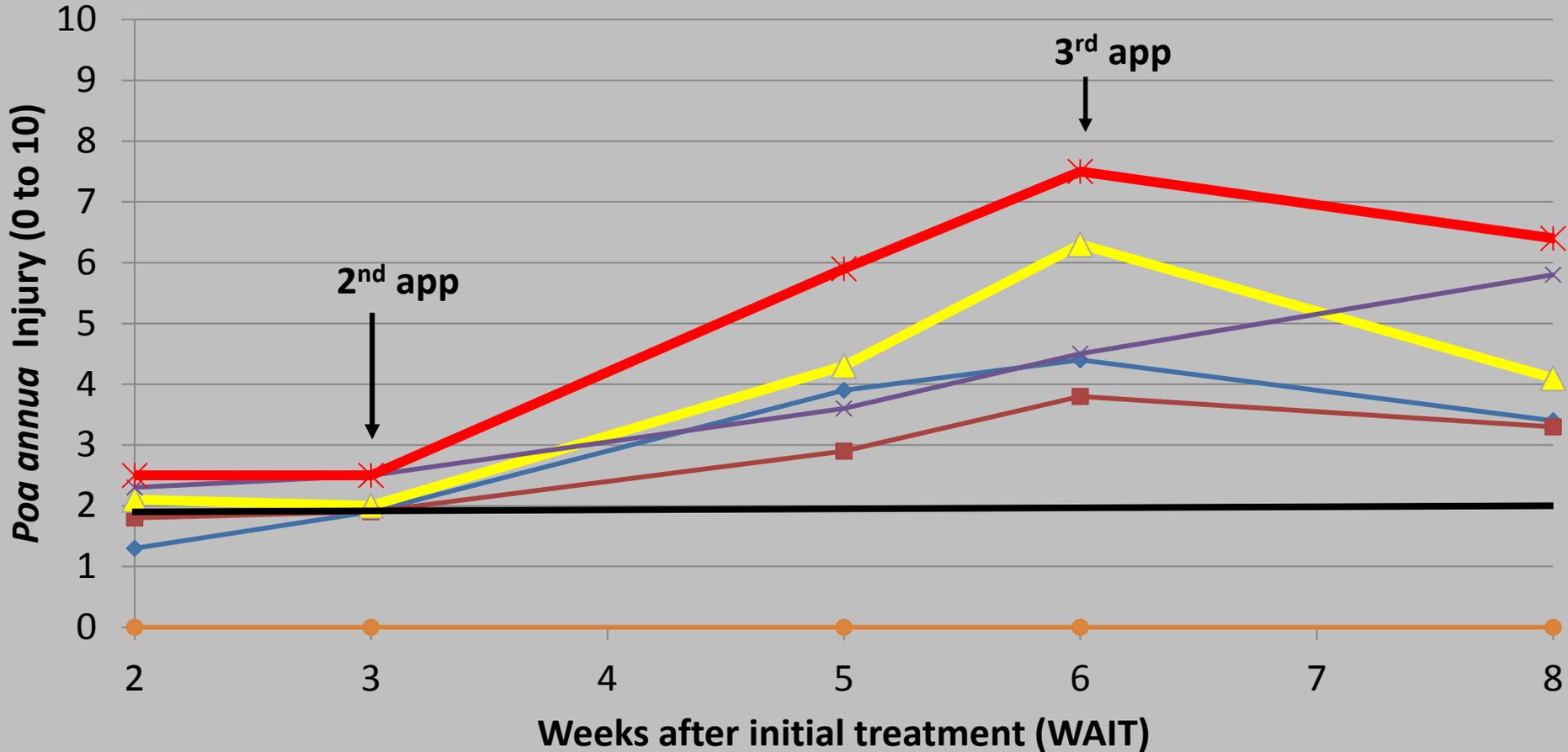


>2 = unacceptable injury

Herbicides applied: May 2, May 23, Jun 13, 2013

Poa annua injury

- Tenacity 5 fl oz + Turflon 16 fl oz
- Tenacity 4 fl oz + Xonerate 1 oz
- Tenacity 5 fl oz + Xonerate 2 oz
- Tenacity 5 fl oz + Trimmit 16 fl oz
- Ten + Turf + Trim 5 + 16 + 16
- CHECK



>2 = unacceptable injury

Herbicides applied: May 2, May 23 and June 13

2 WAIT (May 17)

Tenacity + Trimmit + Turflon

Check

Tenacity 4 fl oz/A + Xonerate 1 oz/A

5 WAIT (June 6)

Tenacity + Trimmit + Turflon

Check

Tenacity 4 fl oz/A + Xonerate 1 oz/A

8 WAIT (June 28)

Tenacity + Trimmit + Turflon

Check

Tenacity 4 fl oz/A + Xonerate 1 oz/A

12 WAIT (July 25)

Tenacity + Trimmit + Turflon

Tenacity + Turflon

Tenacity 4 fl oz/A + Xonerate 1 oz/A

Tenacity + Trimmit

2 WAIT (May 17)

Check

Tenacity 5 fl oz/A + Xonerate 2 oz/A

Tenacity + Trimmit

Tenacity 5 fl oz/A + Xonerate 2 oz/A

5 WAIT (June 6)

Check

Tenacity 5 fl oz/A + Xonerate 2 oz/A

Tenacity 5 fl oz/A + Xonerate 2 oz/A

Tenacity + Trimmit

8 WAIT (June 28)

Check

Tenacity 5 fl oz/A + Xonerate 2 oz/A

Tenacity + Trimmit

Tenacity 5 fl oz/A + Xonerate 2 oz/A

12 WAIT (July 25)

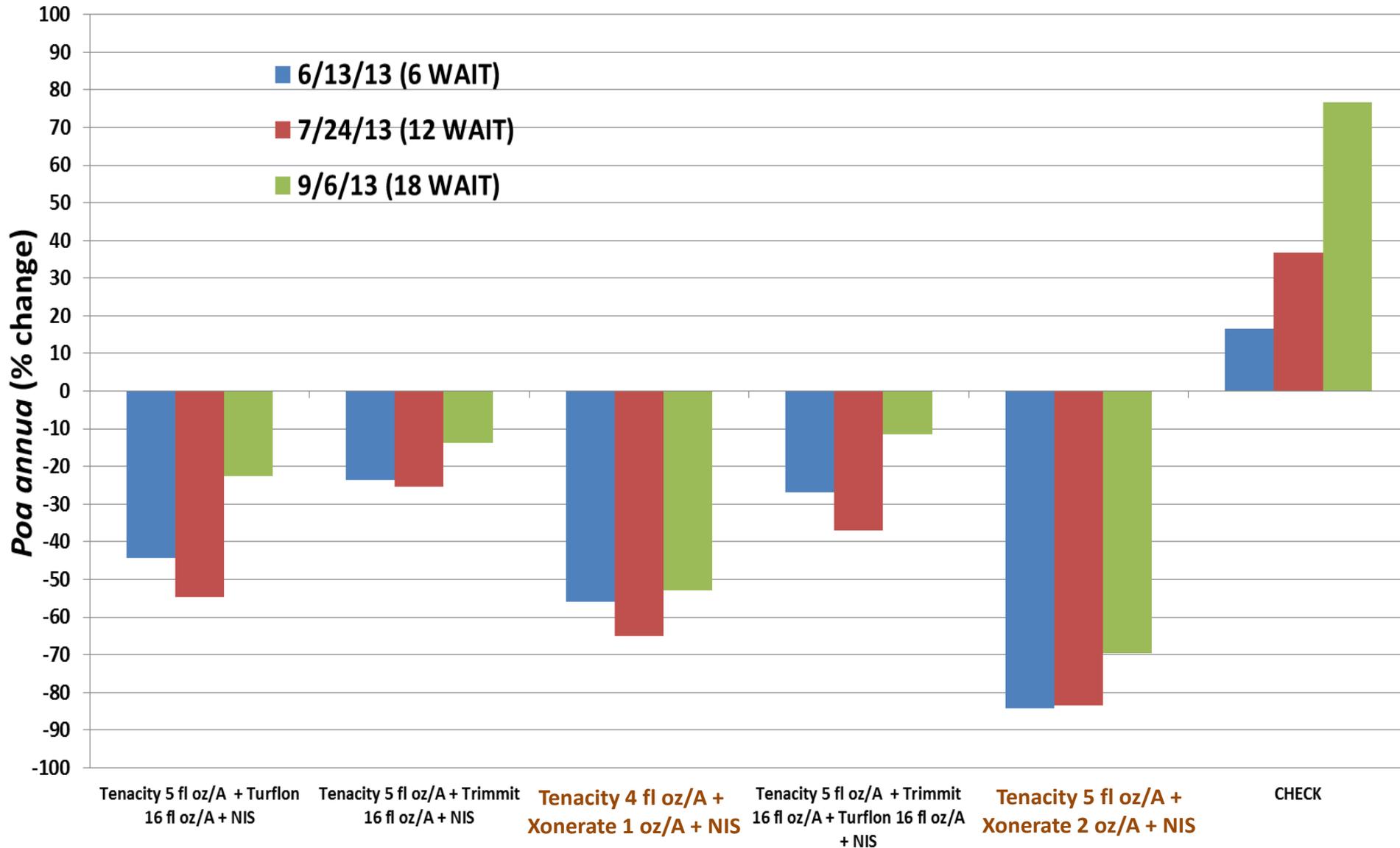
Tenacity + Trimmit

Tenacity 5 fl oz/A + Xonerate 2 oz/A

Tenacity 5 fl oz/A + Xonerate 2 oz/A

Check

Percent change of *Poa annua* in a Kentucky bluegrass stand



18 WAIT (September 6)

Tenacity 5 fl oz/A + Trimmit 16 fl oz/A + NIS

Tenacity 4 fl oz/A + Xonerate 1 oz/A + NIS

Tenacity 4 fl oz/A + Xonerate 1 oz/A + NIS

Tenacity 5 fl oz/A + Trimmit 16 fl oz/A + Turflon + NIS

Herbicides applied May 2, May 23 and June 13

18 WAIT (September 6)

CHECK

**Tenacity 5 fl oz/A + Trimmit 16 fl oz/A +
Turflon Ester Ultra 16 fl oz/A + NIS**

Tenacity 5 fl oz/A + Xonerate 2 oz/A

CHECK

Herbicides applied May 2, May 23 and June 13

Conclusions

- **Tenacity/Xonerate treatments did not eliminate *Poa* but did result in significant reductions of *Poa* in the Kentucky bluegrass stand.**
- However, the high level of *Poa* injury and depressions caused by the Tenacity 5 fl oz/A + Xonerate 2 oz/A treatment leaving pock marked fairways may result in undesirable playing conditions during the peak of the summer when play is highest. (Eventually KBG did grow into and fill these depressions by the end of the study).
- **Tenacity 4 fl oz/A + Xonerate 1 oz/A also resulted in high levels of *Poa* injury for several weeks following initial application.**
- However, this treatment did not cause *Poa* to quickly disappear thus not creating open areas (depressions) in the fairway. This may be a more desirable *Poa* control option to consider in terms of playability.
- **Complete *Poa* control was not achieved with any treatment in this study, therefore, a multi-year program may need to be looked at to possibly achieve this goal or maintain *Poa* at lower levels.**

Questions?

CHECK

Tenacity 5 fl oz/A + Trimmit 16 fl oz/A +
Turflon Ester Ultra 16 fl oz/A + NIS

Tenacity 5 fl oz/A + Xonerate 2 oz/A

CHECK

Herbicides applied May 2, May 23 and June 13