

Development of Tenacity 4SC, Applied in the Fall, for a fairway renovation program to eliminate *Poa annua* (post-emergence) in Kentucky bluegrass

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This study is a repeat of the same exact study conducted a year earlier at the Palouse Ridge Golf Club at WSU in Pullman, WA to determine the efficacy of Tenacity applied alone or combined with other grass weed herbicides for post-emergence control of *Poa annua* in a Kentucky bluegrass/*P. annua* fairway. Each treatment was applied at a spray rate of 25 GPA to the same plots on 16 Sept., 30 Sept., and 14 Oct. 2010 with a bicycle–wheeled CO₂ pressurized sprayer using 11002 flat fan spray nozzles at 40 psi. Prior to applying Tenacity, Barricade was applied on 8 Sept. 2010 at 1 lb ai/A to the entire study area. Individual plot size was 6' x 10'. The experimental design was a randomized complete-block with 3 replications. The percentage of *P. annua* within each plot was determined at the beginning (23 Sept. 2010) and at various time s throughout the Summer of 2010. One week following the first application of herbicides, phytotoxicity on *P. annua* and Kentucky bluegrass was rated every week, or two, up to 2 Nov. 2010. Phytotoxicity was rated from 0 to 10; with 0 = no phytotoxicity and 10 = dead turf. Phytotoxicity levels > 2 are considered unacceptable.

All treatments except Prograss alone at 32 fl oz/A resulted in phytotoxicity to *P. annua* (Fig. 1). Surprisingly, there was more phytotoxicity to *P. annua* with Tenacity alone than Tenacity tank mixed with Velocity or Prograss. These levels of phytotoxicity remained high through the last rating date 2 Nov. 2011. Figure 2 shows the phytotoxicity to the turf on 7 Oct. 2010 3 WAIT.

Velocity alone or tank mixed with Tenacity resulted in unacceptable levels of phytotoxicity to Kentucky bluegrass by approx. 3 WAIT (Figure 2).

Tenacity tank mixed with Prograss resulted in the largest reduction of *P. annua* at 83% when rated on 11 and 25 May 2011 (Table 1 and Figure 5). Tenacity alone resulted in a reduction of nearly the same, followed by the Tenacity with Velocity. Prograss alone resulted in the lowest reduction of all treatments at 13%. It is apparent that by the end of the Summer *P. annua* in the stand increases for all treatments, only Tenacity alone or Tenacity + Prograss showed a reduction in *P. annua* by Sept. 2011. This was evident in the prior study as well. Figure 3 shows the actual percentage of *P. annua* in the turfgrass stand throughout the Summer of 2011. It is hard to determine, but it appears that the Barricade application in the Fall 2010 did not provide any benefit.

With the Tenacity + Prograss and Tenacity alone treatments reducing the *P. annua* in the stand the overall turfgrass quality was increased (Figure 4).

Overall, all treatments except Prograss 32 fl oz/A resulted in high levels of *P. annua* phytotoxicity by 2 WAIT. The 3 applications of Tenacity 5 fl oz/A + Velocity 2 oz/A or Velocity alone at the 2 oz/A resulted in Kentucky bluegrass phytotoxicity above acceptable levels by 2 WAIT. The most effective treatment at reducing the percentage of *P. annua* in the fairway stand was the 3 applications of Tenacity 5 fl oz/A + Prograss 32 fl oz/A, followed closely with Tenacity alone at 5 fl oz/A.

Figure 1. The effect of late Fall applications of Tenacity alone or combined with other grass weed herbicides on *Poa annua* phytotoxicity. Palouse Ridge Golf Club #9 fairway.

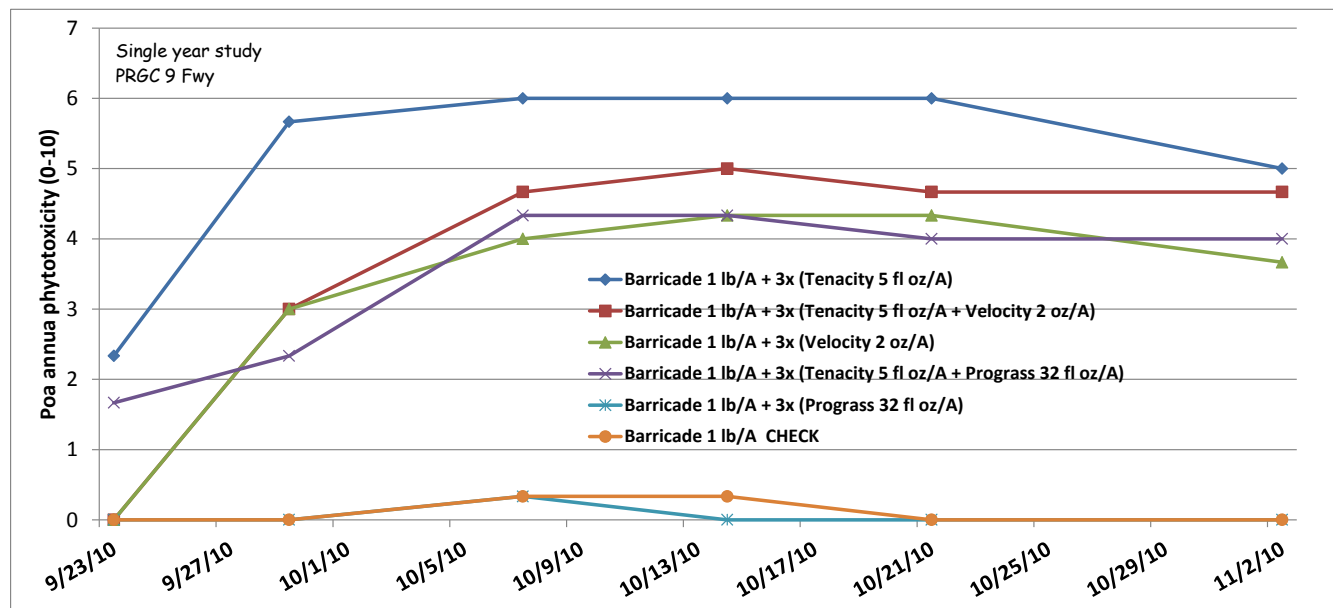


Figure 2. The effect of late Fall applications of Tenacity alone or combined with other grass weed herbicides on Kentucky bluegrass phytotoxicity. Palouse Ridge Golf Club #9 fairway.

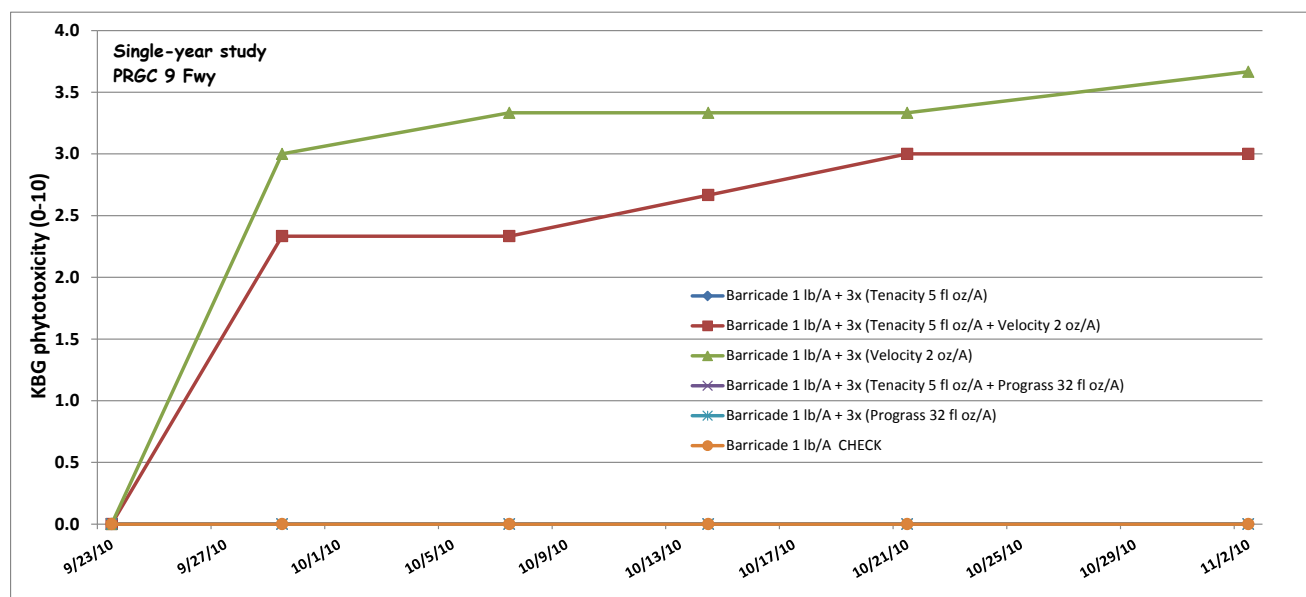


Figure 3. The percentage of *Poa annua* present in the turfgrass stand. Palouse Ridge Golf Club #9 fairway.

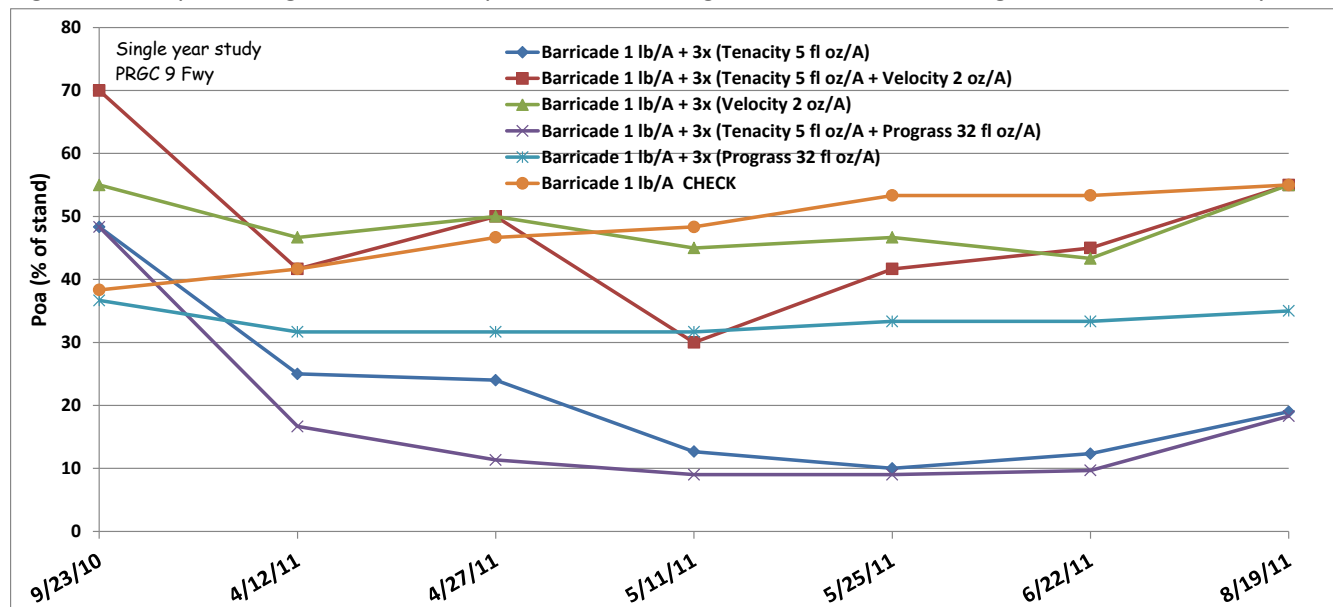


Figure 4. Turfgrass quality.

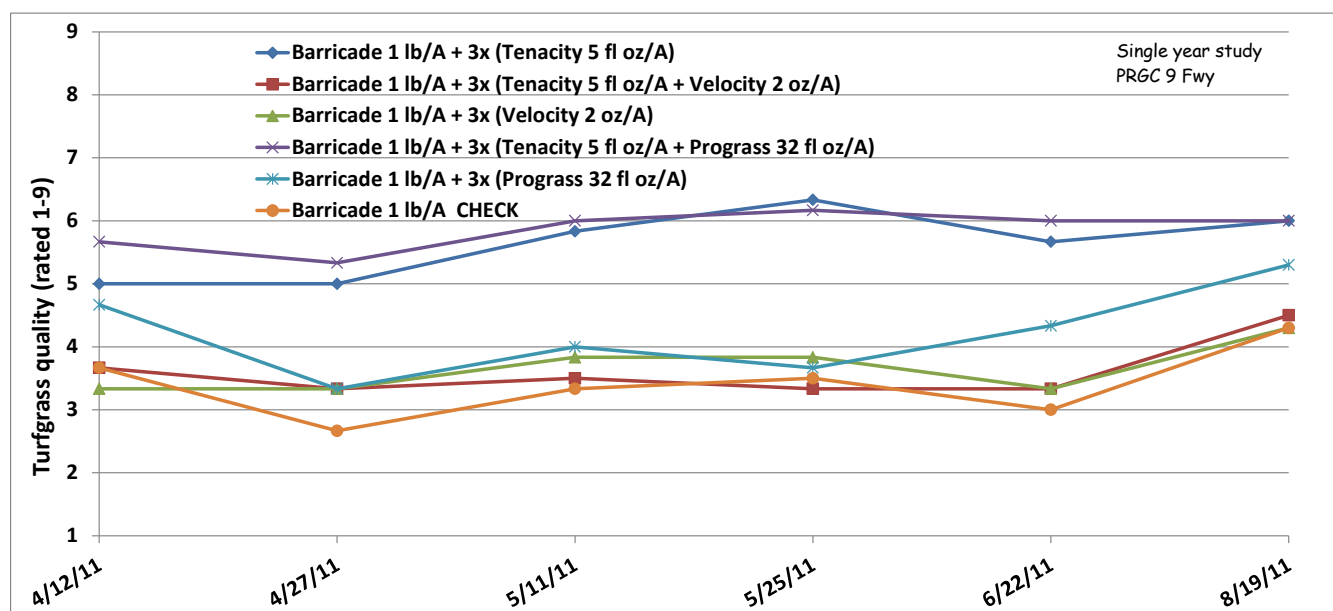


Table 1. Percentage of *Poa annua* reduction.

Treatment	<i>Poa annua</i> reduction (%)							
	9/23/10	4/12/11	4/27/11	5/11/11	5/25/11	6/22/11	8/19/11	9/7/11
Barricade 1 lb/A + 3x (Tenacity 5 fl oz/A)	0	-49.1 bc	-51.3 cd	-76.2 cd	-81.2 d	-75.8 d	-61.0 d	-38.3 bc
Barricade 1 lb/A + 3x (Tenacity 5 fl oz/A + Velocity 2 oz/A)	0	-40.9 b	-29.7 bc	-57.0 c	-41.3 c	-36.3 c	-22.0 c	2.7 ab
Barricade 1 lb/A + 3x (Velocity 2 oz/A)	0	-11.0 a	-6.6 ab	-20.8 b	-16.1 b	-20.5 bc	1.7 b	24.3 a
Barricade 1 lb/A + 3x (Tenacity 5 fl oz/A + Prograss 32 fl oz/A)	0	-68.4 c	-79.5 d	-83.1 d	-83.1 d	-82.1 d	-65.4 d	-59.8 c
Barricade 1 lb/A + 3x (Prograss 32 fl oz/A)	0	-13 a	-13.0 b	-13.0 b	-9.3 b	-9.3 b	-4.5 bc	26.2 a
Barricade 1 lb/A CHECK	0	10.4 a	21.5 a	25.2 a	39.3 a	39.3 a	43.0 a	33.3 a

Figure 5. *Poa annua* reduction

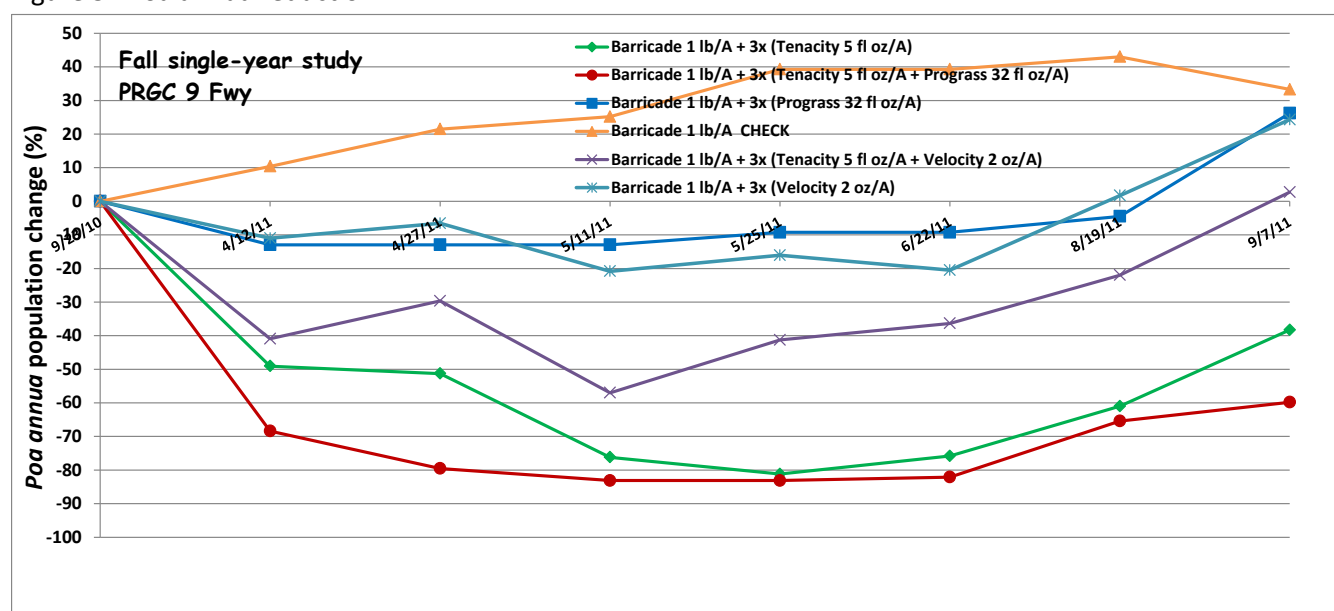


Figure 6. Phytotoxicity on 7 Oct. 2010 three weeks after initial application (WAIT). Palouse Ridge Golf Club #9 fairway.

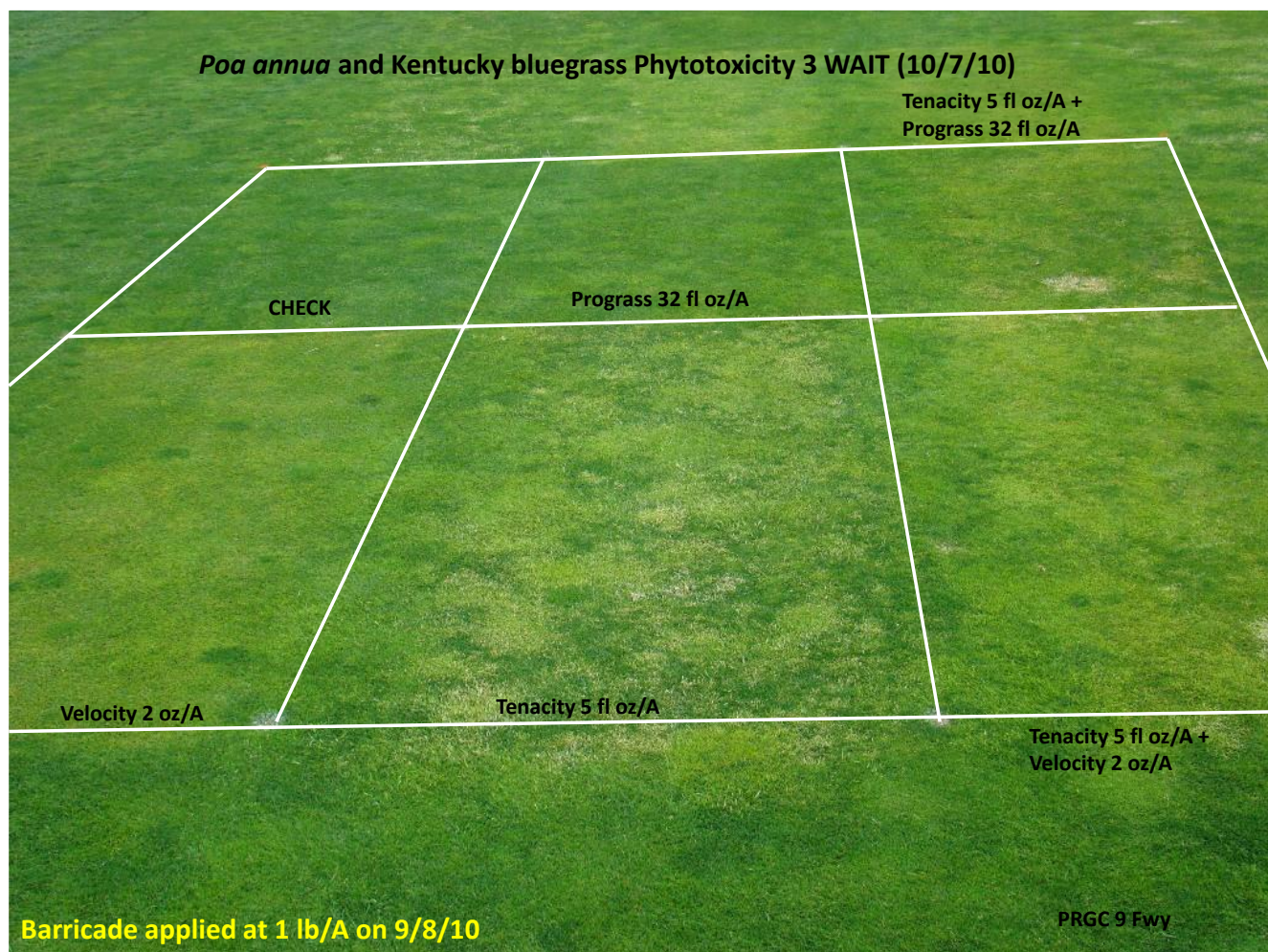


Figure 7. Tenacity treatments on 23 May 2011. Palouse Ridge Golf Club #9 fairway.

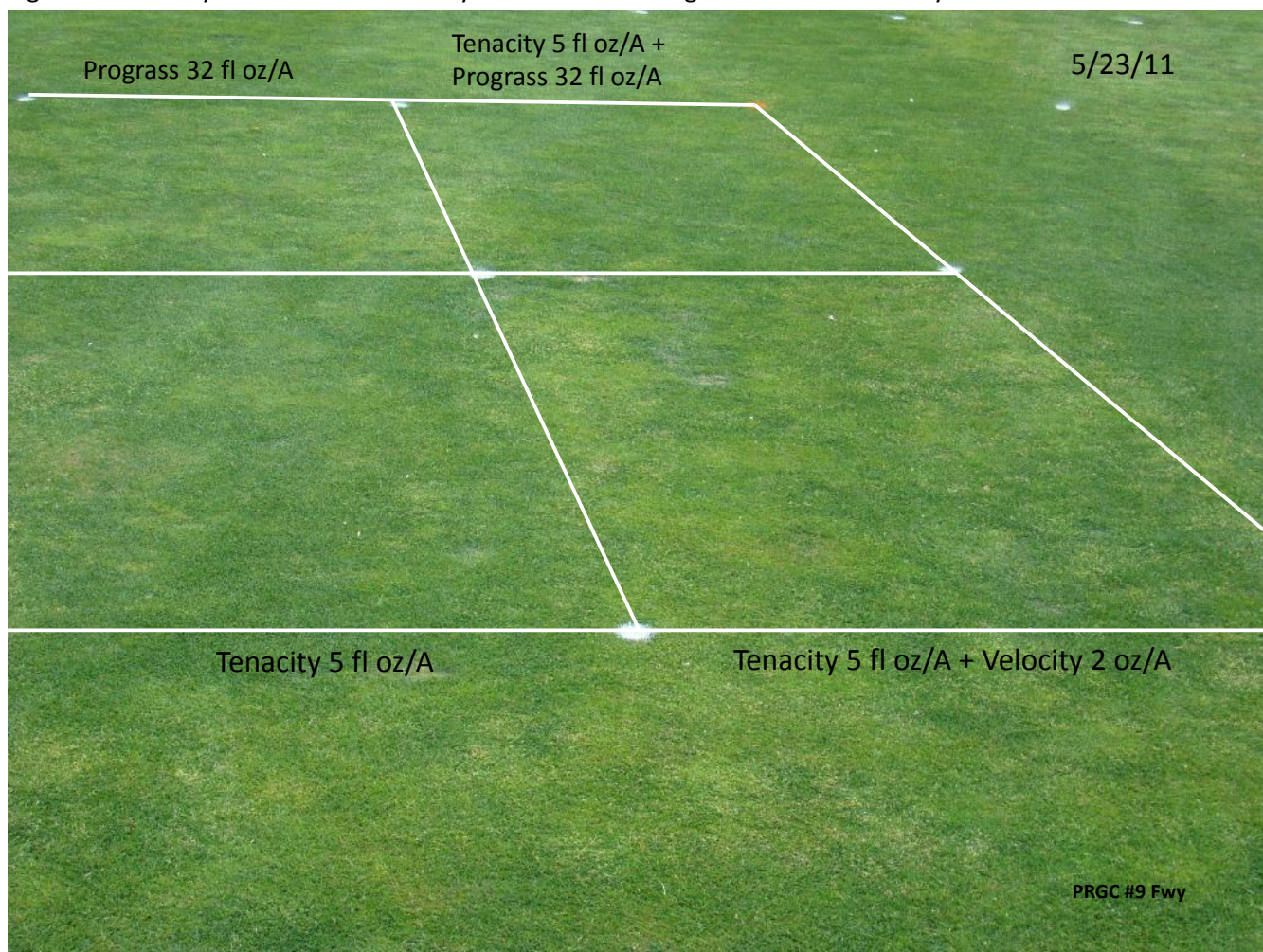


Figure 8. Tenacity treatments on 23 May 2011. Palouse Ridge Golf Club #9 fairway.

