

Comparing the Safety of Tenacity 4SC Formulation to a New 2SC Formulation on Perennial Ryegrass at Seeding

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A field study was conducted at the Washington State University Turfgrass and Agronomy Research Center (TARC), in Pullman, WA, during the summer of 2008 to evaluate the safety of Tenacity 4SC compared to a new 2SC formulation of mesotrione applied as a spray at planting and at first mowing on 'Gallery' perennial ryegrass. The research site was planted on 28 May 08 at a seeding rate of 5 lbs/M. After planting and the spray application, the research area was irrigated with several short cycles per day until the grass seed had germinated and established. After establishment the research site was irrigated to prevent stress. The spray applications at planting (28 May 08) and at first mowing (24 Jun 08) were made with a bicycle-wheeled CO₂ pressurized sprayer with 11002 flat fan spray tips at 25 GPA. The research site was mowed 2 times per week following the initial mowing with a Toro 22" rotary rear bag push mower at a mowing height of 1.5". Beginning at 2 weeks after initial treatment (WAIT) and up to 12 WAIT (20 Aug 08), percent turfgrass cover, percent weed control as a % coverage of plot, and percent weed control as compared to the check were recorded. Weeds in the study area were naturally occurring. The following weeds were present in the study area: pigweed *Amaranthus spp.*, common lambsquarter *Chenopodium album*, prickly lettuce *Lactuca serriola*, pineappleweed *Matricaria matricarioides*, mayweed chamomile *Anthemis cotula*, dandelion *Taraxacum officinale*, shepardspurse *Capsella bursa-pastoris*, witchgrass *Panicum capillare*, and barnyardgrass *Echinochloa crus-galli*. There were no weeds present at the time of planting. Phytotoxicity (turfgrass injury) was rated using a scale of 0-10, with 10 = dead turf and levels above 1.5 (15%) as unacceptable. A randomized-complete block design was used with 3 replications and individual treatment plots were 10' x 10'. There was no data taken 4 WAIT.

Percent turfgrass cover was not affected by any of the treatments at any of the ratings dates (Table 1).

Percent weed coverage of the plot area was low (< 5%) in the check. Tenacity 4SC and 2SC treatments resulted in excellent weed control (Table 2 and 3).

The 280 + 280 g ai/ha split applications of Tenacity 4SC or 2SC showed the same, but unacceptable levels of phytotoxicity 2 WAIT and 6 WAIT (2 weeks after split application) (Table 4). The 175 + 175 g ai/ha split application of Tenacity 4SC or 2SC formulation showed the same, but acceptable levels of phytotoxicity after the initial and split application.

One can conclude from this study that there was no difference between Tenacity 4SC and the 2SC formulation when applied at the same rate on perennial ryegrass at planting. No treatment affected percent turfgrass cover. All treatments provided excellent weed control. However, application of Tenacity 4SC or the 2SC formulation at 280 g ai/ha does cause unacceptable turf injury (phytotoxicity) up to 2 weeks after application.

Table 1. The effect of Tenacity 4SC formulation compared to a new 2SC formulation on percent turfgrass cover of a newly planted perennial ryegrass stand.

Treatment	Type	Tenacity Rate (g ai/ha)	Tenacity Rate (oz/A)	% Turfgrass cover				
				6/11/08 2 WAIT	7/9/08 6 WAIT	7/23/08 8 WAIT	8/6/08 10 WAIT	8/20/08 12 WAIT
CHECK		0	0	35.0	95.0	95.0	97.0	97.0
A12738 + Activator 90	4SC	175 + 175	5 + 5	35.0	95.0	95.0	96.3	97.0
A12738 + Activator 90	4SC	280 + 280	8 + 8	30.0	93.3	96.3	96.3	97.0
EXC3895 + Activator 90	2SC	175 + 175	10 + 10	35.0	95.0	95.7	97.0	97.0
EXC3895 + Activator 90	2SC	280 + 280	16 + 16	30.0	95.0	95.0	95.7	97.0
				ns	ns	ns	ns	ns

Table 2. The effect of Tenacity 4SC formulation compared to a new 2SC formulation on percent weed coverage of a newly planted perennial ryegrass stand.

Treatment	Type	Tenacity	Tenacity	Weeds (% coverage of plot area)				
		Rate (g ai/ha)	Rate (oz/A)	6/11/08 2 WAIT	7/9/08 6 WAIT	7/23/08 8 WAIT	8/6/08 10 WAIT	8/20/08 12 WAIT
CHECK		0	0	1.3 a*	5.0 a	2.3 a	2.3 a	1.0 a
A12738 + Activator 90	4SC	175 + 175	5 + 5	0 b	0.3 b	0 b	0 b	0 b
A12738 + Activator 90	4SC	280 + 280	8 + 8	0 b	0.3 b	0 b	0 b	0 b
EXC3895 + Activator 90	2SC	175 + 175	10 + 10	0 b	0.7 b	0 b	0 b	0 b
EXC3895 + Activator 90	2SC	280 + 280	16 + 16	0 b	0 b	0 b	0 b	0 b

* Values within a column followed by the same letter are not significantly different LSD $P = 0.05$.

Table 3. The effect of Tenacity 4SC formulation compared to a new 2SC formulation on percent weeds compared to the check of a newly planted perennial ryegrass stand.

Treatment	Type	Tenacity	Tenacity	% Weeds compared to check				
		Rate (g ai/ha)	Rate (oz/A)	6/11/08 2 WAIT	7/9/08 6 WAIT	7/23/08 8 WAIT	8/6/08 10 WAIT	8/20/08 12 WAIT
CHECK		0	0	100 a*	100 a	100 a	100 a	100 a
A12738 + Activator 90	4SC	175 + 175	5 + 5	0 b	3.3 b	0 b	0 b	0 b
A12738 + Activator 90	4SC	280 + 280	8 + 8	0 b	3.3 b	0 b	0 b	0 b
EXC3895 + Activator 90	2SC	175 + 175	10 + 10	0 b	6.7 b	0 b	0 b	0 b
EXC3895 + Activator 90	2SC	280 + 280	16 + 16	0 b	0.0 b	0 b	0 b	0 b

* Values within a column followed by the same letter are not significantly different LSD $P = 0.05$.

Table 4. The effect of Tenacity 4SC formulation compared to a new 2SC formulation on perennial ryegrass phytotoxicity (turf injury).

Treatment	Type	Tenacity	Tenacity	Phytotoxicity (rated 0 - 10)				
		Rate (g ai/ha)	Rate (oz/A)	6/11/08 2 WAIT	7/9/08 6 WAIT	7/23/08 8 WAIT	8/6/08 10 WAIT	8/20/08 12 WAIT
CHECK		0	0	0.0 b*	0.0 c	0 a	0 a	0 a
A12738 + Activator 90	4SC	175 + 175	5 + 5	0.3 b	1.0 b	0 a	0 a	0 a
A12738 + Activator 90	4SC	280 + 280	8 + 8	1.7 a	3.3 a	0 a	0 a	0 a
EXC3895 + Activator 90	2SC	175 + 175	10 + 10	0.0 b	1.0 b	0 a	0 a	0 a
EXC3895 + Activator 90	2SC	280 + 280	16 + 16	2.0 a	3.0 a	0 a	0 a	0 a

* Values within a column followed by the same letter are not significantly different LSD $P = 0.05$.