

2009 Adjuvant Evaluation Trial

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Methods: Trial No. 1: Trial was established at the Spence Research Station. Six shaped 40 inch wide beds were irrigated on May 21. The trial area was irrigated twice a week through the evaluation period. All treatments were applied on June 11 (See Table 1). Each plot was one 40-inch bed wide x 20 feet. All treatments were applied on June 11 and were applied with a CO₂ backpack sprayer at 30 psi using one pass of an 8008E nozzle that applied the equivalent of 34 gallons of water per acre. Temperature at application was 58F and winds were at 3 mph. Evaluations included visual estimates of weed control on a 0 – 10 scale with 0 = no weed control and 10 = complete weed control. The main weeds at the site were shepherd's purse, burning nettle, malva and common purslane. Shepherd's purse was the most difficult to control and provided an excellent test species for the efficacy of the materials. Plots were rated on June 12 (1 day after treatment – DAT); June 15 (4 DAT); June 18 (7 DAT); June 26 (25 DAT); and July 2 (32 DAT).

Trial No. 2: Trial was established at the Spence Research Station and was a follow up study to Trial No. 1 to evaluate the potential of Scythe for use as an adjuvant to Goal Tender. Six shaped 40 inch wide beds were irrigated on July 16. The trial area was irrigated twice a week through the evaluation period. All treatments were applied on August 13 and all applications were applied as described above in Trial No. 1. Temperature at application was 60F and wind was 1 mph. Evaluations and weed spectrum were as described above. Plots were rated on August 14 (1 day after treatment – DAT); August 17 (4 DAT); and August 19 (6 DAT).

Results: Trial No. 1: Goal Tender at 0.125 and 0.25 lb a.i./A without added adjuvant was effective on malva, nettle and purslane (Table 1), as both rates had killed these weeds by four days after application. Shepherd's purse provided a difficult-to-control weed that helped to flush out the differences between the treatments. In general all adjuvants improved the efficacy of Goal Tender up through 7 DAT (Table 2); after this date differences in overall weed control were more difficult to detect although some difference in shepherd's purse control could be seen. Scythe at 9.0% was particularly effective on shepherd's purse initially, but the level of control declined by June 18 (7 DAT) as weeds began to resprout; however, this observation caused us to consider conducting an additional trial to test the efficacy of Scythe an adjuvant for Goal Tender. On the final evaluation date (July 2, 32 DAT) there was a clear trend indicating that Goal Tender at 4.0 ounces was weaker than all treatments with added adjuvant (Table 3); in addition, Goal Tender at 8.0 ounces was more effective than the 4.0 ounce rate and there was no improvement with the addition of adjuvant.

Trial No. 2: This trial indicated that there was improved control of weeds with all adjuvants over Goal Tender alone at 4.0 ounces/A on August 17 and 19 (Table 4). Goal Tender + Scythe at 6 and 9.0% had better control of shepherd's purse than all Goal Tender + adjuvant treatments.

Table 1. Trial No. 1. Weed control ratings on two dates

Treatments	Lb ai/A	Material/A	June 12					June 15				
			Shepherd's Purse	Malva	Nettle	Purslane	Overall weeds	Shepherd's Purse	Malva	Nettle	Pursane	Overall weeds
Goal Tender	0.125	4.0 oz	4.00	8.50	9.00	9.50	6.00	4.25	10.00	10.00	10.00	7.50
Goal Tender Activator 90	0.125 0.25%	4.0 oz	5.00	9.25	9.75	10.00	7.50	6.50	10.00	10.00	10.00	8.63
Goal Tender Kinetic	0.125 0.25%	4.0 oz	5.25	9.25	9.75	9.50	7.75	6.25	10.00	10.00	10.00	8.88
Goal Tender Agri-dex COC	0.125 1.0%	4.0 oz	5.25	9.25	9.75	9.75	7.88	5.00	10.00	10.00	10.00	8.50
Goal Tender MSO	0.125 1.0%	4.0 oz	5.00	9.50	9.75	10.00	7.75	5.25	10.00	10.00	10.00	8.25
Goal Tender Dyne-amic	0.125 0.5%	4.0 oz	5.25	9.00	9.75	10.00	7.25	5.50	10.00	10.00	10.00	8.50
Goal Tender	0.25	8.0 oz	4.75	9.00	9.75	9.50	7.50	5.25	10.00	10.00	10.00	8.00
Goal Tender Activator 90	0.25 0.25%	8.0 oz	5.50	9.25	9.75	10.00	7.75	6.00	10.00	10.00	10.00	8.63
Goal Tender Kinetic	0.25 0.25%	8.0 oz	6.00	9.75	9.75	9.75	8.25	7.25	10.00	10.00	10.00	8.88
Goal Tender Agri-dex COC	0.25 1.0%	8.0 oz	5.75	9.50	9.75	10.00	8.25	5.75	10.00	10.00	10.00	8.75
Goal Tender MSO	0.25 1.0%	8.0 oz	5.75	9.25	9.75	10.00	8.00	5.75	10.00	10.00	10.00	8.50
Goal Tender Dyne-amic	0.25 0.5%	8.0 oz	6.00	9.75	9.75	10.00	8.38	6.50	10.00	10.00	10.00	9.00
Goal 2XL	0.125	8.0 oz	5.25	9.25	10.00	10.00	7.88	5.25	10.00	10.00	10.00	8.25
Goal 2XL Activator 90	0.125 0.25%	8.0 oz	6.25	9.75	10.00	10.00	8.38	7.75	10.00	10.00	10.00	9.13
Goal 2XL	0.25	16.0 oz	5.75	9.75	10.00	10.00	8.00	6.25	10.00	10.00	10.00	8.75
Goal 2XL Activator 90	0.25 0.25%	16.0 oz	6.25	10.00	10.00	10.00	8.75	8.00	10.00	10.00	10.00	9.25
Scythe	9.0%		8.80	9.80	9.50	10.00	9.40	9.40	10.00	10.00	10.00	9.60
Untreated	----	----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pr>Treat			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
LSD _{0.05}			0.65	0.65	0.70	0.41	0.93	1.38	NA	NA	NA	0.77
Tukey _{0.05}			1.18	1.18	1.28	0.75	1.70	2.52	NA	NA	NA	1.40

Table 2. Trial No. 1. Weed control ratings on two dates

Treatments	Lb ai/A	Material/A	June 18					June 26				
			Shepherd's Purse	Malva	Nettle	Purslane	Overall weeds	Shepherd's Purse	Malva	Nettle	Purslane	Overall weeds
Goal Tender	0.125	4.0 oz	7.63	10.00	10.00	10.00	8.75	8.88	10.00	10.00	10.00	9.13
Goal Tender Activator 90	0.125 0.25%	4.0 oz	8.25	10.00	10.00	10.00	9.00	9.40	10.00	10.00	10.00	9.40
Goal Tender Kinetic	0.125 0.25%	4.0 oz	8.38	10.00	10.00	10.00	9.18	9.38	10.00	10.00	10.00	9.38
Goal Tender Agri-dex COC	0.125 1.0%	4.0 oz	8.63	10.00	10.00	10.00	9.25	9.13	10.00	10.00	10.00	9.25
Goal Tender MSO	0.125 1.0%	4.0 oz	8.38	10.00	10.00	10.00	9.25	9.18	10.00	10.00	9.75	9.57
Goal Tender Dyne-amic	0.125 0.5%	4.0 oz	8.25	10.00	10.00	10.00	9.00	9.08	10.00	10.00	10.00	9.33
Goal Tender	0.25	8.0 oz	8.75	10.00	10.00	10.00	9.25	9.75	10.00	10.00	10.00	9.75
Goal Tender Activator 90	0.25 0.25%	8.0 oz	8.25	10.00	10.00	10.00	9.13	9.48	10.00	10.00	10.00	9.48
Goal Tender Kinetic	0.25 0.25%	8.0 oz	9.00	10.00	10.00	10.00	9.65	9.78	10.00	10.00	10.00	9.78
Goal Tender Agri-dex COC	0.25 1.0%	8.0 oz	9.20	10.00	10.00	10.00	9.63	9.78	10.00	10.00	10.00	9.78
Goal Tender MSO	0.25 1.0%	8.0 oz	8.55	10.00	10.00	10.00	9.25	9.60	10.00	10.00	10.00	9.60
Goal Tender Dyne-amic	0.25 0.5%	8.0 oz	9.13	10.00	10.00	10.00	9.68	9.78	10.00	10.00	10.00	9.78
Goal 2XL	0.125	8.0 oz	8.63	10.00	10.00	10.00	9.20	9.25	10.00	10.00	10.00	9.25
Goal 2XL Activator 90	0.125 0.25%	8.0 oz	8.93	10.00	10.00	10.00	9.48	9.75	10.00	10.00	10.00	9.75
Goal 2XL	0.25	16.0 oz	9.13	10.00	10.00	10.00	9.45	9.75	10.00	10.00	10.00	9.75
Goal 2XL Activator 90	0.25 0.25%	16.0 oz	9.08	10.00	10.00	10.00	9.53	9.78	10.00	10.00	10.00	9.78
Scythe	9.0%		9.00	9.30	9.30	9.30	9.20	8.40	8.80	8.80	8.50	8.40
Untreated	----	----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pr>Treat			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
LSD _{0.05}			1.47	0.50	0.50	0.50	0.68	0.67	0.42	0.50	0.46	0.53
Tukey _{0.05}			2.68	0.92	0.92	0.92	1.24	1.22	0.77	0.92	0.85	0.97

Table 3. Trial No. 1. Weed control ratings on one date

Treatments	Lb ai/A	Material/A	July 2				
			Shepherd's Purse	Malva	Nettle	Purslane	Overall weeds
Goal Tender	0.125	4.0 oz	8.88	10.00	10.00	10.00	9.05
Goal Tender Activator 90	0.125 0.25%	4.0 oz	9.45	10.00	10.00	10.00	9.58
Goal Tender Kinetic	0.125 0.25%	4.0 oz	9.25	10.00	10.00	10.00	9.28
Goal Tender Agri-dex COC	0.125 1.0%	4.0 oz	9.15	10.00	10.00	10.00	9.13
Goal Tender MSO	0.125 1.0%	4.0 oz	9.33	10.00	10.00	10.00	9.45
Goal Tender Dyne-amic	0.125 0.5%	4.0 oz	9.45	10.00	10.00	10.00	9.33
Goal Tender	0.25	8.0 oz	9.78	10.00	10.00	10.00	9.78
Goal Tender Activator 90	0.25 0.25%	8.0 oz	9.35	10.00	10.00	10.00	9.35
Goal Tender Kinetic	0.25 0.25%	8.0 oz	9.80	10.00	10.00	10.00	9.80
Goal Tender Agri-dex COC	0.25 1.0%	8.0 oz	9.80	10.00	10.00	10.00	9.80
Goal Tender MSO	0.25 1.0%	8.0 oz	9.60	10.00	10.00	10.00	9.48
Goal Tender Dyne-amic	0.25 0.5%	8.0 oz	9.78	10.00	10.00	10.00	9.78
Goal 2XL	0.125	8.0 oz	9.25	10.00	10.00	10.00	9.25
Goal 2XL Activator 90	0.125 0.25%	8.0 oz	9.80	10.00	10.00	10.00	9.80
Goal 2XL	0.25	16.0 oz	9.70	10.00	10.00	10.00	9.70
Goal 2XL Activator 90	0.25 0.25%	16.0 oz	9.80	10.00	10.00	10.00	9.80
Scythe	9.0%		8.00	8.80	8.80	8.50	8.30
Untreated	----	----	0.00	0.00	0.00	0.00	0.00
Pr>Treat			<0.001	<0.001	<0.001	<0.001	<0.001
LSD _{0.05}			0.70	0.42	0.50	0.43	0.67
Tukey _{0.05}			1.28	0.77	0.92	0.79	1.23

Table 4. Trial No. 2. Weed control ratings on three dates.

Treatment	Lbs a.i./A	Material/A	Aug 14	August 17				August 19			
			Overall	Malva	Purslane	S. Purse	Overall Weeds	Malva	Purslane	S. Purse	Overall Weeds
Goal Tender	0.125	4.0 oz	4.7	8.7	9.0	4.0	5.0	9.0	9.0	4.7	5.3
Goal Tender Activator 90	0.125 0.25%	4.0 oz	5.7	10.0	10.0	5.0	6.3	10.0	10.0	5.3	6.3
Goal Tender Kinetic	0.125 0.25%	4.0 oz	6.3	10.0	10.0	5.0	7.0	10.0	10.0	6.3	6.7
Goal Tender Agri-dex COC	0.125 1.0%	4.0 oz	6.7	9.7	10.0	5.0	6.7	10.0	10.0	5.7	6.0
Goal Tender MSO	0.125 1.0%	4.0 oz	6.0	10.0	10.0	5.0	6.3	10.0	10.0	5.0	6.3
Goal Tender Dyne-amic	0.125 0.5%	4.0 oz	6.0	10.0	9.7	5.0	6.7	10.0	10.0	5.0	6.0
Goal Tender Scythe	0.125 1.0%	4.0 oz	6.7	10.0	10.0	5.0	6.7	10.0	10.0	6.3	7.3
Goal Tender Scythe	0.125 2.0%	4.0 oz	7.0	10.0	10.0	5.3	6.7	10.0	10.0	7.7	8.0
Goal Tender Scythe	0.125 3.0%	4.0 oz	7.3	10.0	10.0	7.0	7.7	10.0	10.0	7.7	8.3
Goal Tender Scythe	0.125 6.0%	4.0 oz	7.3	10.0	10.0	7.7	8.3	10.0	10.0	8.3	9.0
Goal Tender Scythe	0.125 9.0%	4.0 oz	7.7	10.0	10.0	8.3	8.7	10.0	10.0	8.7	9.0
Scythe	3%		4.7	3.0	3.3	2.7	3.0	3.0	3.0	2.7	2.7
Scythe	6%		7.3	5.3	5.3	5.0	5.3	5.7	5.7	4.0	5.7
Scythe	9%		8.0	8.0	8.0	6.3	7.3	8.3	7.7	5.3	7.3
Untreated	----		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pr>Treat			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pr>Block			0.495	0.164	0.482	0.009	0.012	0.164	0.482	0.009	0.012
LSD _{0.05}			1.5	1.3	1.2	1.1	1.2	1.3	1.2	1.1	1.3

Photos of treatments on June 12, 2009



Goal Tender (GT) 4 oz



GT 4 oz + Activator 90



GT 4 oz + Kinetic



GT 4 oz + Agri-dex COC



GT 4 oz + MSO



GT 4 oz + Dyne-amic



GT 8 oz



GT 8 oz + Activator 90



GT 8 oz + Kinetic



GT 8 oz + Agri-dex COC



GT 8 oz + MSO



GT 8 oz + Dyne-amic



G2XL 8 oz



G2XL 8 oz + Activator 90



G2XL 16 oz



G2XL 16 oz + Activator 90



Scythe 9%



Untreated

Photos of treatments on June 15, 2009



GT 4 oz



GT 4 oz + Activator 90



GT 4 oz + Kinetic



GT 4 oz + Agri-dex COC



GT 4 oz + MSO



GT 4 oz + Dyne-amic



GT 8 oz



GT 8 oz + Activator 90



GT 8 oz + Kinetic



GT 8 oz + Agri-dex COC



GT 8 oz + MSO



GT 8 oz + Dyne-amic



G2XL 8 oz



G2XL 8 oz + Activator 90



G2XL 16 oz



G2XL 16 oz + Activator 90



Scythe 9%



Untreated