2007 Evaluation of Sensitivities of Annual Bedding Plants to Mesotrione (Tenacity) Herbicide

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Final Report

Introduction

The purpose of this trial was to evaluate the sensitivity of four species of annual bedding plants to Mesotrione (Tenacity) herbicide. The initial treatments were applied 24 hours before planting. A second application was made six weeks later over the top of the plants.

Materials and Methods

The trial was initiated on May 16th at the Lewis-Brown Horticulture Farm in Corvallis, Oregon. Treatments were applied between 2:15 and 3:15 p.m. and four species of annuals were planted (4 plants of each species per plot) the following day. A second application was made on June 29 th.

The treatments are listed below:

		Rate
Trt #	Treatment	lbs ai/A
1	Check	na
2	Tenacity (EXC877 0.116 gr)	0.125
3	Tenacity (EXC877 0.116 gr)	0.250
4	Tenacity (EXC877 0.116 gr)	0.500
5	Tenacity (A12738 (480 GA/L)	0.250

Annual Bedding Plants Used:

Common Name	Scientific Name
White Alyssum	*Lobularia maritima* 'White'
Coleus 'Wizard Mix'	*Coleus x hybridus* 'Wizard Mix'
Marigold 'Inca Yellow'	*Tagetes erecta* 'Inca Yellow'
Blue Salvia 'Victoria'	*Salvia farinacea* 'Victoria'

The bedding plants were chosen because of their widespread use and vigorous growth pattern, and were purchased from Peoria Gardens, Inc, a well respected grower and wholesale supplier of annuals and perennials. They can be found online at www.peoriagardens.com (541) 753-8519.

The Alyssum, Coleus, and Marigolds were all purchased as 6-packs which have 48 plants per flat. Unfortunately, the 6-packs of the Salvia were sold out, and therefore, the next

largest size was purchased – 4 inch pots, which are much larger plants and have 18 plants per flat.

The site had been used as a rose bed for many years and horse compost had been added periodically over the top to suppress weeds. Before the trial was initiated, the roses were removed and 3 inches of horse compost was added and then thoroughly tilled into the existing silty clay loam soil/horse compost mix (pH around 6.0). After the plants were planted, a methylene based nitrogen fertilizer was applied by hand.

Treatments 2 through 4 were applied with a shaker can and a 5 X 5 plot box with 3 foot high sides. Eight ounces of "Turface MVP" (a 100% calcined clay product) was added to each treatment to bulk up the treatments and improve uniformity of application. (www.profileproducts.com)

Treatment 5 was applied with a CO_2-powered sprayer using TeeJet 80015 nozzles at 30 psi producing a total spray volume of one gallon per 1,000 square feet.

The plants were individually hand watered for the first week to prevent a hydrophobic root ball that can occur with container-grown plants. After the first week, all the plots were irrigated with a RainBird irrigation system using landscape (5000) heads.

Injury ratings were made on the following dates: June 5th, June 29th, July 13th, July 27th, and September 12th. Each plot contained 16 plants, 4 from each species. The injury ratings for each species were averaged producing one injury rating for each plot for each species. Data for each species was separated for each date and were subjected to analysis of variance using a randomized complete block design with 4 replications. Differences between means were determined by LSD at the 5% level.

Results – See Table 1:

The Salvia was least sensitive to the mesotrione herbicide which was likely the result of these plants being much bigger at planting. However, there was significant injury and it was correlated with rate. 16 percent of Salvia plants died as a result of the treatments as of end of the trial - September 12th.

The most sensitive plants were the Alyssum followed closely by the Coleus. By June 29th, treatments 4 and 5 had killed all the Alyssum and nearly all had died in treatment 3. By the end of the trial, only 3 out of 64 treated plants survived (all in treatment 2). The Coleus plants were a little slower to die but by the end of the trial, only 4 of the treated plants survived.

The Marigolds were only marginally less sensitive than the Coleus. By the end of the trial, only 12 of the 64 treated plants survived.

The Effect of the Second Application

It is difficult to know precisely whether the second application killed plants that were already going to die, but you can look at the data on June 29th and make some educated guesses. It is likely that the Alyssum, Coleus, and Marigold would have had similar results (i.e. they would have died) if the second application had not been made.

The Salvia is a little more difficult to interpret. The two lower granular rates and the liquid (trt 5) only produced slight injury – 2.2 and below – and they would likely have survived. The high rate had an average injury rating of 4.8, but some of the individual plants had injury as high as 7. It is impossible to know whether or not they would have survived.

Other Observations Related to Preemergent Activity of Mesotrione

Some additional observations were made which were not within the scope of this trial but which may be useful information.

In terms of preemergent control, the plots treated with the high rate of Mesotrione had far fewer annual bluegrass plants, as well as, broadleaf weeds, than all the other treatments. The high rate of Mesotrione (0.5 lbs ai/A) appeared to control common purslane, where the lower rates did not.

The weeds that germinated during the trial included, **common purslane (*Portulaca oleracea*), annual bluegrass (*Poa annua*), and members of the Asteracea family.**

Table 1: Injury Ratings: 1 – 9; 1 = no injury, 9 = dead

***Lobularia maritima* 'White'**

Trt #	**White Alyssum** Treatment	Rate lbs ai/A	**6/5** Avg	**6/29** Avg	**7/13** Avg	**7/27** Avg	**9/12** Avg
1	Check	na	1.0	1.3	1.3	1.8	1.9
2	Tenacity (EXC877 0.116 gr)	0.125	3.6	7.4	7.9	7.8	7.5
3	Tenacity (EXC877 0.116 gr)	0.250	4.3	8.8	8.8	9.0	9.0
4	Tenacity (EXC877 0.116 gr)	0.500	6.4	9.0	9.0	9.0	9.0
5	Tenacity (A12738 (480 GA/L)	0.250	5.5	9.0	9.0	9.0	9.0
		LSD @ .05	**1.8**	**1.0**	**0.9**	**1.0**	**1.4**

***Coleus x hybridus* 'Wizard Mix'**

Trt #	**Coleus 'Wizard Mix'** Treatment	Rate lbs ai/A	**6/5** Avg	**6/29** Avg	**7/13** Avg	**7/27** Avg	**9/12** Avg
1	Check	na	1.2	1.0	1.0	1.0	1.1
2	Tenacity (EXC877 0.116 gr)	0.125	3.3	5.9	7.1	7.7	7.8
3	Tenacity (EXC877 0.116 gr)	0.250	6.1	8.5	8.9	9.0	9.0
4	Tenacity (EXC877 0.116 gr)	0.500	7.2	8.4	9.0	9.0	9.0
5	Tenacity (A12738 (480 GA/L)	0.250	6.3	7.9	8.9	9.0	9.0
		LSD @ .05	**1.3**	**1.8**	**1.7**	**1.5**	**1.5**

***Tagetes erecta* 'Inca Yellow'**

Trt #	**Marigold 'Inca Yellow'** Treatment	Rate lbs ai/A	**6/5** Avg	**6/29** Avg	**7/13** Avg	**7/27** Avg	**9/12** Avg
1	Check	na	1.0	1.0	1.0	1.4	1.0
2	Tenacity (EXC877 0.116 gr)	0.125	2.9	6.7	7.8	7.9	7.7
3	Tenacity (EXC877 0.116 gr)	0.250	3.8	7.4	8.3	8.8	8.4
4	Tenacity (EXC877 0.116 gr)	0.500	5.1	8.1	8.8	9.0	9.0
5	Tenacity (A12738 (480 GA/L)	0.250	4.4	7.4	8.7	8.9	8.6
		LSD @ .05	**0.8**	**0.7**	**0.5**	**1.1**	**1.2**

***Salvia farinacea* 'Victoria'**

Trt #	**Salvia 'Victoria'** Treatment	Rate lbs ai/A	**6/5** Avg	**6/29** Avg	**7/13** Avg	**7/27** Avg	**9/12** Avg
1	Check	na	1.0	1.0	1.0	1.0	1.0
2	Tenacity (EXC877 0.116 gr)	0.125	1.8	1.3	2.4	1.6	1.3
3	Tenacity (EXC877 0.116 gr)	0.250	3.1	2.2	3.8	3.7	3.4
4	Tenacity (EXC877 0.116 gr)	0.500	3.9	4.8	6.0	6.4	5.8
5	Tenacity (A12738 (480 GA/L)	0.250	2.9	1.8	4.6	4.7	4.8
		LSD @ .05	**0.9**	**0.9**	**1.3**	**2.5**	**3.2**