

## Testing of Herbicides in Ornamental Bulbs (2005-06)

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One ornamental bulb study was conducted at WSU NWREC during 2006: an Aquacap/Pyramin and new herbicide trial. Plant material for this study was kindly donated by Washington Bulb Co. and funds were provided by the BASF and the Washington Commission for Pesticide Registration.

### Results:

'Dutch Master' daffodil, 'Ile de France' tulip, and 'Blue Diamond' iris were planted in October, 2005 and various rates and timings of Aquacap and Pyramin were applied (preemergence, November and January). Other products tested were Dimension (dithiopyr), Callisto (mesotrione), Everest (flucarbazone), Granite (penoxsulam), KIH-485, and V-10142. Roundup was mixed with the products at both timings to kill emerged weeds at the time of application. Weed control was rated February 10, March 23, May 4, and June 2, and flower height and number were measured at full bloom (March 20, April 19, and May 16 for daffodil, tulip, and iris, respectively). Bulbs will be harvested this summer and yield parameters determined. The statistical design for this trial was a randomized complete block design with three replicates. Means were separated using Fisher's Protected LSD ( $P = 0.05$ ). Results are presented in Tables 1 through 4.

Weed control has been outstanding with most treatments through early May (Table 1). Only four treatments are less than 90% as of May 5: Aquacap alone (fall or spring) and Everest (fall)(Table 1). Products began to lose their efficacy by June, with Aquacap ranging from 79 to 86% control, Pyramin at 74 to 88 % control, and the six combinations from 78 to 89% control. Of the new products at the June evaluation, V-10142, Dimension, Granite, and Callisto performed the best (85% or better weed control).

No visible injury to daffodil or iris was apparent (data not shown), while slight foliar injury to tulip was noted from V-10142 application (5% in February and 13% in March) and Granite (6% in March)(Table 1). No further injury was noted on tulip or other bulb foliage after the March evaluation. Tulip flower height was significantly reduced only by V-10142 (14 inches compared to 17 inches for non-treated tulips)(Table 2). No herbicide resulted in reduced flower number of daffodil, tulip, or iris and no herbicide reduced daffodil or iris flower height.

Bulb production was not significantly affected by herbicide application (Table 3), nor did harvested bulb differ in count or weight in any size class (data not shown).

Based on these data, all these herbicides and combinations remain good candidates for continued testing. V-10142 may need to be reduced from the 2.1 oz rate to prevent tulip foliar and flower height injury, however.

Table 1. Tulip injury and weed control in ornamental bulbs treated with various herbicides.

Treatment <sup>a</sup>	Rate <sup>a</sup>	Timing <sup>a</sup>	Tulip injury		Weed control			
			Feb 10	Mar 23	Feb 10	Mar 23	May 4	June 2
	Product/a		%	%	%	%	%	%
1. Aquacap	4.2 pts	Fall	0	0	99	98	90	86
2. Aquacap	4.2 pts	Spring	0	0	98	97	85	79
3. Pyramin	3.7 lbs	Fall	0	0	100	100	92	74
4. Pyramin	3.7 lbs	Spring	0	0	100	100	99	88
5. Aquacap + Pyramin	4.2 pts + 3.7 lbs	Fall + Fall	0	0	100	100	94	78
6. Aquacap + Pyramin	4.2 pts + 3.7 lbs	Spring + Spring	0	0	99	100	100	89
7. Pyramin fb Aquacap	3.7 lbs + 4.2 pts	Fall fb Spring	0	0	100	100	97	79
8. Aquacap fb Pyramin	4.2 pts fb 3.7 lbs	Fall + Spring	0	0	100	100	99	86
9. (Aquacap + Pyramin) fb (Aquacap + Pyramin)	(2.1 pts + 1.8 lbs) fb (2.1 pts + 1.8 lbs)	(Fall) fb (Spring)	0	0	100	100	99	84
10. (Aquacap + Pyramin) fb (Aquacap + Pyramin)	(4.2 pts + 3.7 lbs) fb (4.2 pts + 3.7 lbs)	(Fall) fb (Spring)	0	0	100	100	97	80
11. Untreated check	---	---	0	0	98	95	81	0
12. Dimension	2 pts	Fall	0	0	100	100	99	92
13. Callisto	8 fl.oz	Fall	0	0	100	100	95	85
14. Everest	0.6 oz	Fall	0	0	100	99	81	36
15. KIH-485	2 oz	Fall	5	13	99	99	94	84
16. Granite	1.4 fl.oz	Fall	0	6	100	100	99	91
17. V-10142	2.1 oz	Fall	0	0	100	100	99	95
LSD <sub>0.05</sub>	---	---	1	2	2	3	8	16

<sup>a</sup>fb = “followed by” (e.g., sequential application of herbicides). All treatments were mixed with 0.75 lbs ae glyphosate/acre to control emerged weeds. “Fall” applications were made November 17, 2005; “spring” applications were made PRE January 24, 2006.

Table 2. Flower number and height of ornamental bulbs treated with various herbicides.

Treatment <sup>a</sup>	Rate <sup>a</sup> product/a	Timing <sup>a</sup>	Daffodil		Tulip		Iris	
			Number per plot	Height inches	Number per plot	Height inches	Number per plot	Height inches
1. Aquacap	4.2 pts	Fall	29	13	35	17	32	21
2. Aquacap	4.2 pts	Spring	27	13	34	16	33	21
3. Pyramin	3.7 lbs	Fall	27	14	36	17	33	22
4. Pyramin	3.7 lbs	Spring	28	13	35	16	34	21
5. Aquacap + Pyramin	4.2 pts + 3.7 lbs	Fall + Fall	31	13	35	17	32	21
6. Aquacap + Pyramin	4.2 pts + 3.7 lbs	Spring + Spring	28	13	35	16	34	21
7. Pyramin fb Aquacap	3.7 lbs + 4.2 pts	Fall fb Spring	27	13	36	17	33	21
8. Aquacap fb Pyramin	4.2 pts fb 3.7 lbs	Fall + Spring	29	14	35	17	32	21
9. (Aquacap + Pyramin) fb (Aquacap + Pyramin)	(2.1 pts + 1.8 lbs) fb (2.1 pts + 1.8 lbs)	(Fall) fb (Spring)	30	14	37	17	33	21
10. (Aquacap + Pyramin) fb (Aquacap + Pyramin)	(4.2 pts + 3.7 lbs) fb (4.2 pts + 3.7 lbs)	(Fall) fb (Spring)	29	13	36	17	31	21
11. Untreated check	---	---	28	13	36	17	32	22
12. Dimension	2 pts	Fall	30	13	35	17	32	21
13. Callisto	8 fl.oz	Fall	27	13	36	17	33	21
14. Everest	0.6 oz	Fall	30	13	34	16	34	21
15. KIH-485	2 oz	Fall	27	13	35	17	34	22
16. Granite	1.4 fl.oz	Fall	30	13	34	16	32	20
17. V-10142	2.1 oz	Fall	29	13	35	14	35	21
LSD <sub>0.05</sub>	---	---	ns	ns	ns	1	ns	ns

<sup>a</sup>fb = "followed by" (e.g., sequential application of herbicides). All treatments were mixed with 0.75 lbs ae glyphosate/acre to control emerged weeds. "Fall" applications were made November 17, 2005; "spring" applications were made PRE January 24, 2006.

Table 3. Yield of ornamental bulbs treated with various herbicides.

Treatment <sup>a</sup>	Rate <sup>a</sup> product/a	Timing <sup>a</sup>	Daffodil			Tulip			Iris		
			total wt. kg/plot	total no. no./plot	avg. wt g/bulb	total wt. kg/plot	total no. no./plot	avg. wt g/bulb	total wt. kg/plot	total no. no./plot	avg. wt g/bulb
1. Aquacap	4.2 pts	Fall	4.06	31	134	1.77	152	11.6	1.50	185	8.1
2. Aquacap	4.2 pts	Spring	3.49	29	120	1.79	144	12.4	1.60	189	8.5
3. Pyramin	3.7 lbs	Fall	3.55	29	124	1.80	155	11.6	1.55	188	8.3
4. Pyramin	3.7 lbs	Spring	3.37	28	121	1.69	142	11.9	1.58	180	8.7
5. Aquacap + Pyramin	4.2 pts + 3.7 lbs	Fall + Fall	3.51	29	121	1.84	147	12.5	1.49	177	8.5
6. Aquacap + Pyramin	4.2 pts + 3.7 lbs	Spring + Spring	3.46	28	124	1.78	149	12.1	1.49	177	8.4
7. Pyramin fb Aquacap	3.7 lbs + 4.2 pts	Fall fb Spring	3.49	29	122	1.74	142	12.2	1.58	190	8.3
8. Aquacap fb Pyramin	4.2 pts fb 3.7 lbs	Fall + Spring	3.84	31	124	1.80	154	11.7	1.54	173	8.9
9. (Aquacap + Pyramin) fb (Aquacap + Pyramin)	(2.1 pts + 1.8 lbs) fb (2.1 pts + 1.8 lbs)	(Fall) fb (Spring)	3.89	30	129	1.85	154	12.0	1.57	181	8.7
10. (Aquacap + Pyramin) fb (Aquacap + Pyramin)	(4.2 pts + 3.7 lbs) fb (4.2 pts + 3.7 lbs)	(Fall) fb (Spring)	3.73	29	129	1.77	150	11.8	1.38	170	8.1
11. Untreated check	---	---	3.34	30	113	1.74	145	12.0	1.59	188	8.4
12. Dimension	2 pts	Fall	3.90	30	129	1.68	140	12.1	1.62	183	8.9
13. Callisto	8 fl.oz	Fall	3.42	27	127	1.81	150	12.1	1.57	183	8.6
14. Everest	0.6 oz	Fall	3.45	30	114	1.79	157	11.5	1.50	188	8.0
15. KIH-485	2 oz	Fall	3.30	29	113	1.52	148	10.1	1.62	191	8.5
16. Granite	1.4 fl.oz	Fall	3.74	31	121	1.58	157	10.1	1.45	177	8.2
17. V-10142	2.1 oz	Fall	3.75	31	123	1.73	149	11.7	1.55	187	8.3
LSD <sub>0.05</sub>	---	---	ns	ns	ns	ns	ns	ns	ns	ns	ns

<sup>a</sup>fb = “followed by” (e.g., sequential application of herbicides). All treatments were mixed with 0.75 lbs ae glyphosate/acre to control emerged weeds. “Fall” applications were made November 17, 2005; “spring” applications were made PRE January 24, 2006.