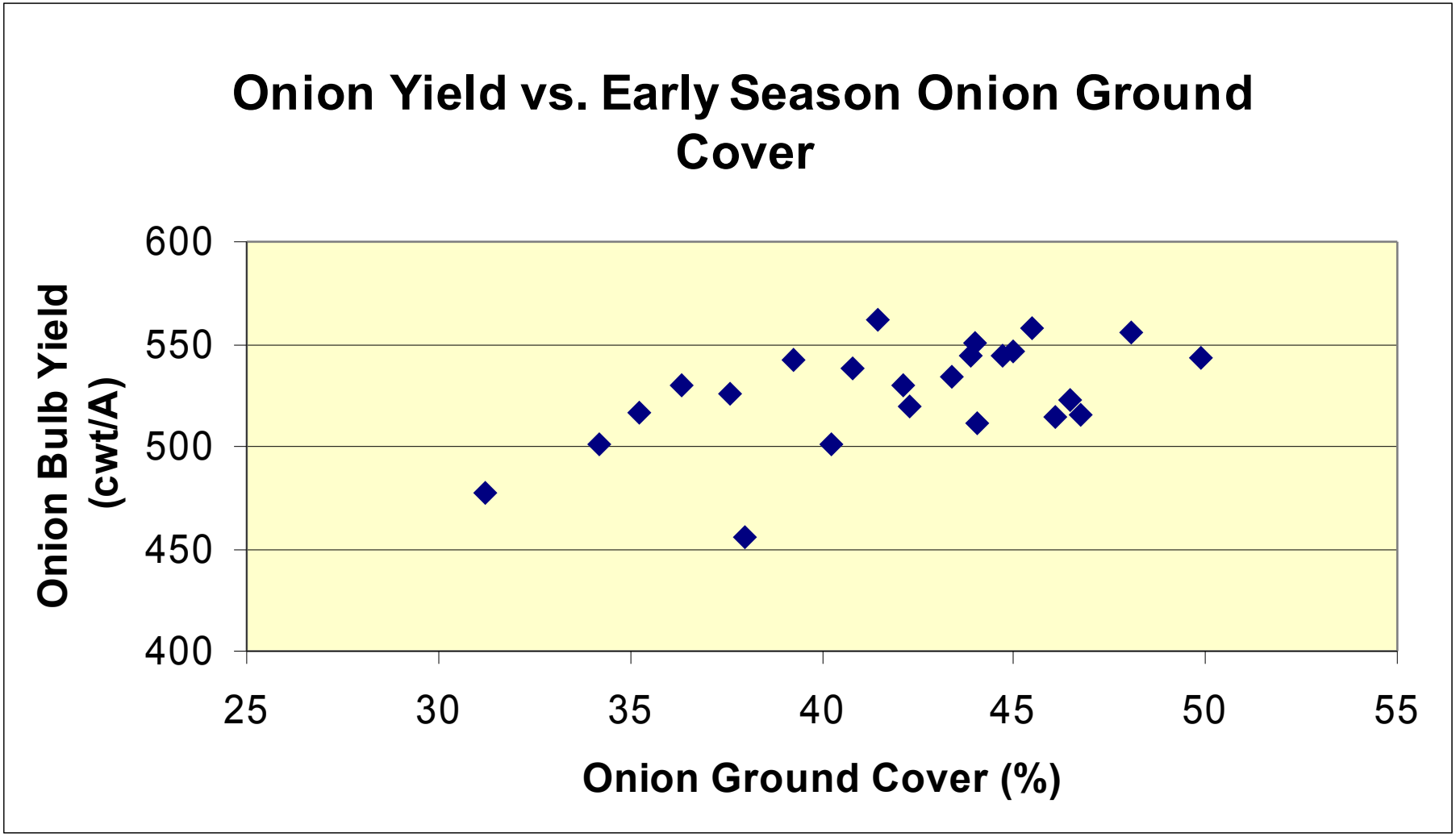
Weed Control Trials in Onions

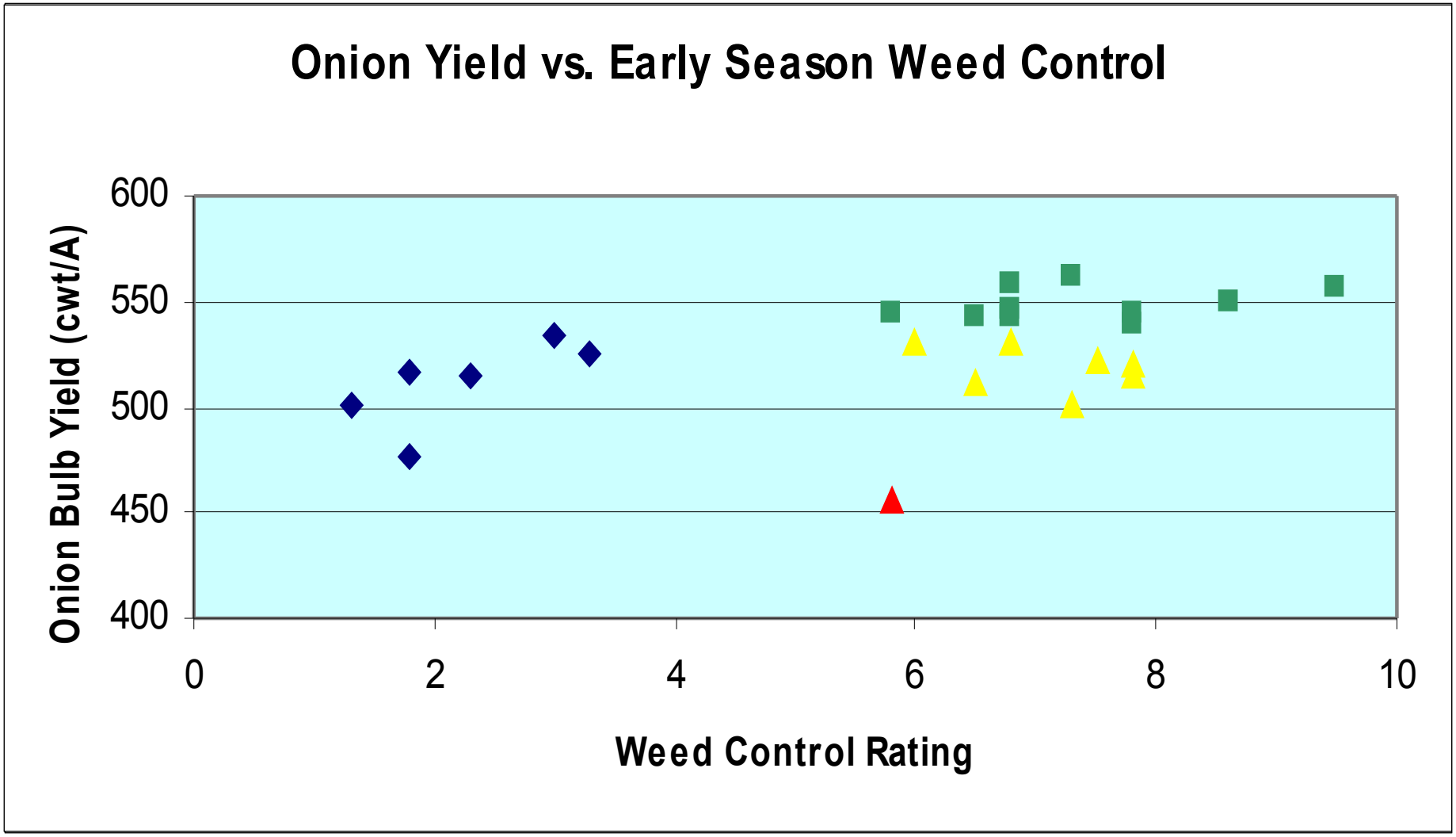
Disclaimer regarding pesticides information:

This report includes **research results** involving pesticides. **It does not contain recommendations** for their use, nor does it imply that the uses discussed herein have been registered. Pesticides must be registered by appropriate federal and state agencies before they can be recommended.

Commercial companies and products are mentioned in this publication solely for the purpose of providing specific information. Mention of a company or product does not constitute a guarantee by the University of California or an endorsement over products of other companies not mentioned.

	Application Timing, Date, and Onion Growth Stage					
	2 True Leaf Applied: 5/26/04		3 True Leaf Applied: 6/3/04		4 True Leaf Applied: 6/11/04	
Treatment Number	Herbicide	Rate	Herbic	Rate	Herbicic	Rate
1	Goal	2 oz/a	Goal	2 oz/a	Goal	6 oz/a
2	Goal	4 oz/a	Goal	4 oz/a	Goal	4 oz/a
3	Goal	6 oz/a			Goal	6 oz/a
4	Goal	8 oz/a			Goal	4 oz/a
5	Buctril	1 pt/a				
6	Buctril	1.5 pt/a				
7	Prowl	3.6 pt/a				
8	Prowl	4.8 pt/a				
9	Goal + Buctril	2 oz/a + .5 pt/a	Goal	2 oz/a	Goal	6 oz/a
10	Goal + Buctril	3 oz/a + .5 pt/a	Goal	3 oz/a	Goal	6 oz/a
11	Goal + Buctril	4 oz/a + .5 pt/a	Goal	4 oz/a	Goal	4 oz/a
12	Goal + Buctril	2 oz/a + 1 pt/a	Goal	2 oz/a	Goal	6 oz/a
13	Goal + Buctril	3 oz/a + 1 pt/a	Goal	3 oz/a	Goal	6 oz/a
14	Goal + Buctril	4 oz/a + 1 pt/a	Goal	4 oz/a	Goal	4 oz/a
15	Goal + Prowl	3 oz/a + 3.6 pt/a	Goal	3 oz/a	Goal	6 oz/a
16	Goal + Prowl	4 oz/a + 3.6 pt/a	Goal	4 oz/a	Goal	4 oz/a
17	Goal + Prowl	6 oz/a + 3.6 pt/a			Goal	6 oz/a
18	Goal + Prowl	3 oz/a + 4.8 pt/a	Goal	3 oz/a	Goal	6 oz/a
19	Goal + Prowl	4 oz/a + 4.8 pt/a			Goal	6 oz/a
20	Goal + Prowl	6 oz/a + 4.8 pt/a			Goal	6 oz/a
21	Outlook	18 oz/a				
22	Outlook	21 oz/a				
23	Untreated					
24	Untreated					


Onion Yield vs. Early Season Onion Ground Cover
Onion Bulb Yield (cwt/A)
600
550
500
450
400
25
30
35
40
45
50
55
Onion Ground Cover (%)


Onion Yield vs. Early Season Weed Control
Onion Bulb Yield (cwt/A)
600
550
500
450
400
0
2
4
6
8
10
Weed Control Rating

Continuing Issues

- Need improved consistency/crop safety
- Need to control very early emerged weed seedlings
- Need season long weed control
- Need some residual soil activity
- Need to translate results to chemigation

Chemigation Studies

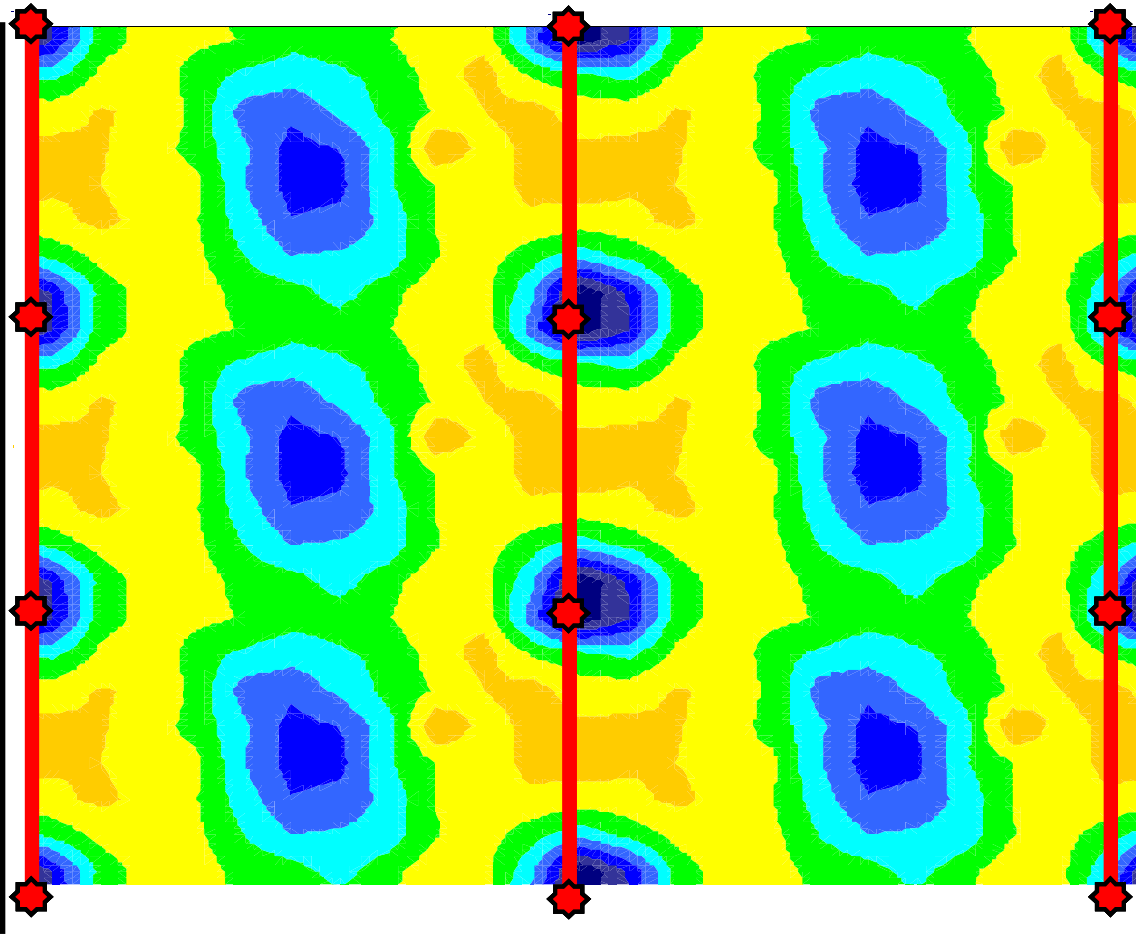

2
6
8
10
12
14
16

		Aplication Date and Onion Gropwth Stage			
		6/1	6/6	6/9	6/13
#	Herbicides	Flag leaf to 1 true leaf	1.5 leaf	2 leaf	3 leaf
1	Goal XL	Goal XL @ 2oz/A	Goal XL @ 2oz/A		Goal @ 4 oz
2	Goal XL		Goal XL @ 4oz/A	Goal @ 4oz/A	Goal @ 6 oz
3	Goal + Buctril		Goal XL @ 4oz/A + Buctril @ 4 oz/A	Goal @ 4oz/A	Goal @ 6 oz
4	Outlook + Goal	Outlook @ 21 oz/A + Goal XL @ 2oz/A	Goal XL @ 2oz/A		Goal @ 4 oz
5	Outlook + Goal		Goal XL @ 4oz/A + Outlook @ 21 oz/A	Goal @ 4oz/A	Goal @ 6 oz
6	Outlook + Goal + Buctril		Goal XL @ 4oz/A + Buctril @ 4 oz/A + Outlook @ 21 oz/A	Goal @ 4oz/A	Goal @ 6 oz
7	Prowl + Goal	Prowl @ 4 pts/A + Goal XL @ 2oz/A	Goal XL @ 2oz/A		Goal @ 4 oz
8	Prowl + Goal + Outlook	Prowl @ 4 pts/A + Goal XL @ 2oz/A + Outlook @ 10.5 oz/A	Goal XL @ 2oz/A		Goal @ 4 oz + Outlook @ 10.5 oz/A
9	UTC (hand weeded weekly)				
10	UTC				

		Aplication Date and Onion Gropwth Stage				
		6/1	6/6	6/9	6/13	6/26
#	Herbicides	Flag leaf to 1 true leaf	1.5 leaf	2 leaf	3 leaf	Weed Control Rating (10=complete control)
1	Goal XL	Goal XL @ 2oz/A	Goal XL @ 2oz/A		Goal @ 4 oz	9.8
2	Goal XL		Goal XL @ 4oz/A	Goal @ 4oz/A	Goal @ 6 oz	8.7
3	Goal + Buctril		Goal XL @ 4oz/A + Buctril @ 4 oz/A	Goal @ 4oz/A	Goal @ 6 oz	8.5
4	Outlook + Goal	Outlook @ 21 oz/A + Goal XL @ 2oz/A	Goal XL @ 2oz/A		Goal @ 4 oz	9.5
5	Outlook + Goal		Goal XL @ 4oz/A + Outlook @ 21 oz/A	Goal @ 4oz/A	Goal @ 6 oz	9.6
6	Outlook + Goal + Buctril		Goal XL @ 4oz/A + Buctril @ 4 oz/A + Outlook @ 21 oz/A	Goal @ 4oz/A	Goal @ 6 oz	8.6
7	Prowl + Goal	Prowl @ 4 pts/A + Goal XL @ 2oz/A	Goal XL @ 2oz/A		Goal @ 4 oz	8.9
8	Prowl + Goal + Outlook	Prowl @ 4 pts/A + Goal XL @ 2oz/A + Outlook @ 10.5 oz/A	Goal XL @ 2oz/A		Goal @ 4 oz + Outlook @ 10.5 oz/A	10.0
9	UTC (hand weeded weekly)					10.0
10	UTC					1.0

		Aplication Date and Onion Gropwth Stage					
		6/1	6/6	6/9	6/13	6/26	
#	Herbicides	Flag leaf to 1 true leaf	1.5 leaf	2 leaf	3 leaf	Weed Control Rating (10=complete control)	Onion Yield (cwt/A)
1	Goal XL	Goal XL @ 2oz/A	Goal XL @ 2oz/A		Goal @ 4 oz	9.8	323
2	Goal XL		Goal XL @ 4oz/A	Goal @ 4oz/A	Goal @ 6 oz	8.7	318
3	Goal + Buctril		Goal XL @ 4oz/A + Buctril @ 4 oz/A	Goal @ 4oz/A	Goal @ 6 oz	8.5	328
4	Outlook + Goal	Outlook @ 21 oz/A + Goal XL @ 2oz/A	Goal XL @ 2oz/A		Goal @ 4 oz	9.5	307
5	Outlook + Goal		Goal XL @ 4oz/A + Outlook @ 21 oz/A	Goal @ 4oz/A	Goal @ 6 oz	9.6	317
6	Outlook + Goal + Buctril		Goal XL @ 4oz/A + Buctril @ 4 oz/A + Outlook @ 21 oz/A	Goal @ 4oz/A	Goal @ 6 oz	8.6	296
7	Prowl + Goal	Prowl @ 4 pts/A + Goal XL @ 2oz/A	Goal XL @ 2oz/A		Goal @ 4 oz	8.9	324
8	Prowl + Goal + Outlook	Prowl @ 4 pts/A + Goal XL @ 2oz/A + Outlook @ 10.5 oz/A	Goal XL @ 2oz/A		Goal @ 4 oz + Outlook @ 10.5 oz/A	10.0	322
9	UTC (hand weeded weekly)					10.0	313
10	UTC					1.0	0

Figure 2. Visual representation of chemical distribution in a field resulting from chemication through solid set sprinklers. In this typical example, impact sprinklers with 7/64" nozzles were used with sprinklers spaced 40' along the lateral and 60 feet between laterals. Red lines illustrate location of the lateral pipe and the red stars indicate sprinkler head locations. The colors code for the percentage of chemical applied in each area of the field. Note some areas received as little as 50 % of the target application and other areas received nearly 200% of the average or target application. Improvements in sprinkler system design (sprinkler type and spacing) can greatly improve distribution uniformity and reduce over and under application



Percentage of Target Chemical Applied

50-70 70-90 90-110 110-130 130-150 150-170 170-190 190-200

2007 Tulelake Herbicide Chemigation Trial in Dehydrator Onions

Treatment #	Herbicide Application					
	1 true leaf 5/24/07	2 true leaf 6/4/07				
1	Goal @ 2 oz/A	Goal @ 4 oz/A				
2	--	Goal @ 4 oz/A				
3	Goal @ 1 oz/A Outlook @ 5.25 oz/A Prowl @ 2 pt/A	Goal @ 2 oz/A Outlook @ 5.25 oz/A				
4	Goal @ 1.5 oz/A Outlook @ 7.9 oz/A Prowl @ 3 pt/A	Goal @ 3 oz/A Outlook @ 7.9 oz/A				
5	Goal @ 2 oz/A Outlook @ 10.5 oz/A Prowl @ 4 pt/A	Goal @ 4 oz/A Outlook @ 10.5 oz/A				
6	Goal @ 3 oz/A Outlook @ 15.75 oz/A Prowl @ 6 pt/A	Goal @ 6 oz/A Outlook @ 15.75 oz/A				
7	Goal @4 oz/A Outlook @ 21 oz/A Prowl @ 8 pt/A	Goal @ 8 oz/A Outlook @ 21 oz/A				
8	Goal @ 2 oz/A Outlook @ 10.5 oz/A	Goal @ 4 oz/A Outlook @ 10.5 oz/A				
9	Goal @ 2 oz/A Prowl @ 4 pt/A	Goal @ 4 oz/A				
10	Prowl @ 4 pt/A	Goal @ 4 oz/A Outlook @ 21 oz/A				
11	Hand Weeded Control					
12	Non-weeded Control					
		Mean				
		LSD (0.05)				
		CV%				

2007 Tulelake Herbicide Chemigation Trial in Dehydrator Onions

Treatment #	Herbicide Application		Weed Control Rating (0-10, 10=100% control)			
	1 true leaf 5/24/07	2 true leaf 6/4/07	6/4/07	6/18/07		
1	Goal @ 2 oz/A	Goal @ 4 oz/A	9.0	9.3		
2	--	Goal @ 4 oz/A	1.0	7.8		
3	Goal @ 1 oz/A Outlook @ 5.25 oz/A Prowl @ 2 pt/A	Goal @ 2 oz/A Outlook @ 5.25 oz/A	6.5	7.0		
4	Goal @ 1.5 oz/A Outlook @ 7.9 oz/A Prowl @ 3 pt/A	Goal @ 3 oz/A Outlook @ 7.9 oz/A	6.5	8.0		
5	Goal @ 2 oz/A Outlook @ 10.5 oz/A Prowl @ 4 pt/A	Goal @ 4 oz/A Outlook @ 10.5 oz/A	8.3	8.9		
6	Goal @ 3 oz/A Outlook @ 15.75 oz/A Prowl @ 6 pt/A	Goal @ 6 oz/A Outlook @ 15.75 oz/A	9.1	10.0		
7	Goal @4 oz/A Outlook @ 21 oz/A Prowl @ 8 pt/A	Goal @ 8 oz/A Outlook @ 21 oz/A	9.5	10.0		
8	Goal @ 2 oz/A Outlook @ 10.5 oz/A	Goal @ 4 oz/A Outlook @ 10.5 oz/A	7.8	8.6		
9	Goal @ 2 oz/A Prowl @ 4 pt/A	Goal @ 4 oz/A	8.3	9.1		
10	Prowl @ 4 pt/A	Goal @ 4 oz/A Outlook @ 21 oz/A	1.8	8.4		
11	Hand Weeded Control		1.8	9.3		
12	Non-weeded Control		0.5	0.0		
		Mean	5.82	8.02		
		LSD (0.05)	1.57	0.89		
		CV%	18.69	7.67		

2007 Tulelake Herbicide Chemigation Trial in Dehydrator Onions

Treatment #	Herbicide Application		Weed Control Rating (0-10, 10=100% control)		Weeding Time (Man Hours/A)	
	1 true leaf 5/24/07	2 true leaf 6/4/07	6/4/07	6/18/07	6/20/07	
1	Goal @ 2 oz/A	Goal @ 4 oz/A	9.0	9.3	10.3	
2	--	Goal @ 4 oz/A	1.0	7.8	18.8	
3	Goal @ 1 oz/A Outlook @ 5.25 oz/A Prowl @ 2 pt/A	Goal @ 2 oz/A Outlook @ 5.25 oz/A	6.5	7.0	34.7	
4	Goal @ 1.5 oz/A Outlook @ 7.9 oz/A Prowl @ 3 pt/A	Goal @ 3 oz/A Outlook @ 7.9 oz/A	6.5	8.0	16.6	
5	Goal @ 2 oz/A Outlook @ 10.5 oz/A Prowl @ 4 pt/A	Goal @ 4 oz/A Outlook @ 10.5 oz/A	8.3	8.9	14.8	
6	Goal @ 3 oz/A Outlook @ 15.75 oz/A Prowl @ 6 pt/A	Goal @ 6 oz/A Outlook @ 15.75 oz/A	9.1	10.0	4.6	
7	Goal @4 oz/A Outlook @ 21 oz/A Prowl @ 8 pt/A	Goal @ 8 oz/A Outlook @ 21 oz/A	9.5	10.0	4.5	
8	Goal @ 2 oz/A Outlook @ 10.5 oz/A	Goal @ 4 oz/A Outlook @ 10.5 oz/A	7.8	8.6	13.3	
9	Goal @ 2 oz/A Prowl @ 4 pt/A	Goal @ 4 oz/A	8.3	9.1	12.9	
10	Prowl @ 4 pt/A	Goal @ 4 oz/A Outlook @ 21 oz/A	1.8	8.4	20.5	
11	Hand Weeded Control		1.8	9.3	10.4*	
12	Non-weeded Control		0.5	0.0	---	
		Mean	5.82	8.02	14.7	
		LSD (0.05)	1.57	0.89	62.1	
		CV%	18.69	7.67	13.1	

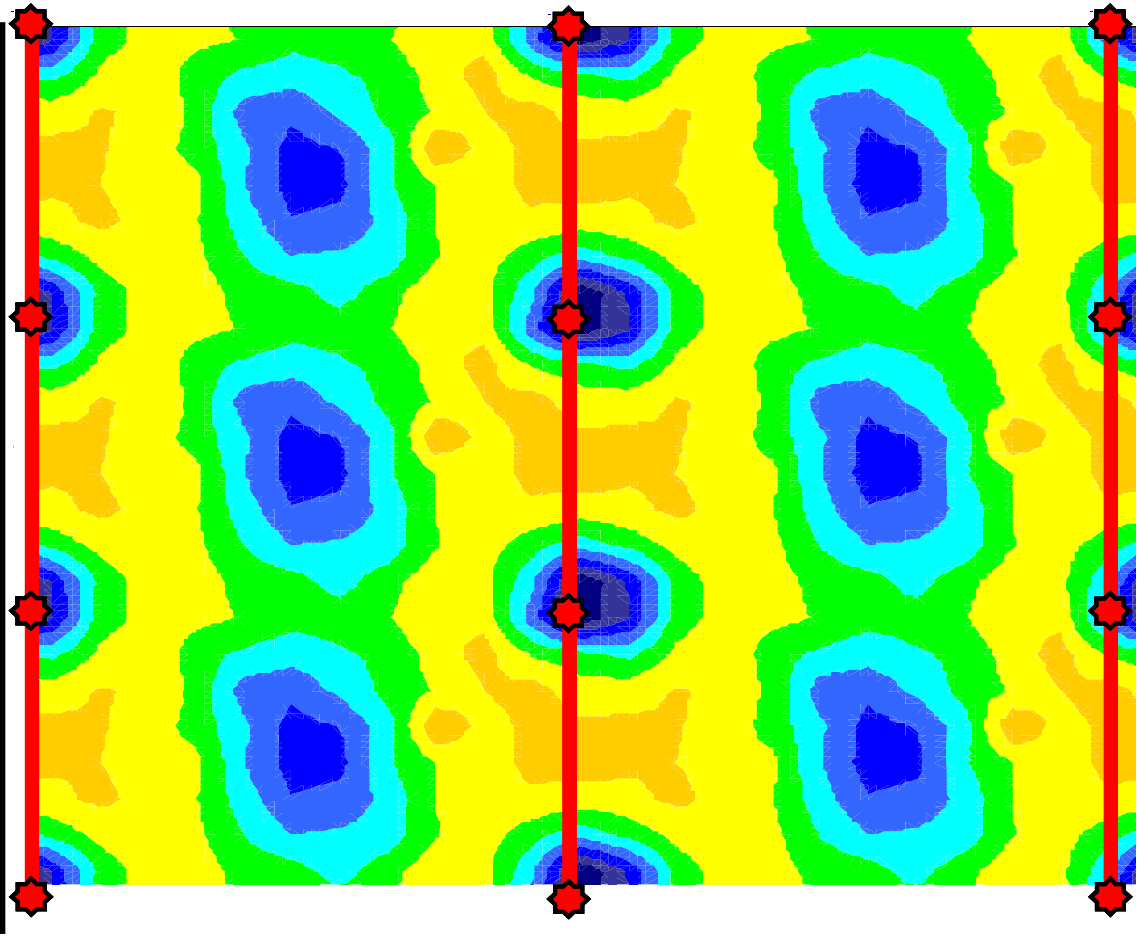
2007 Tulelake Herbicide Chemigation Trial in Dehydrator Onions

Treatment #	Herbicide Application		Weed Control Rating (0-10, 10=100% control)		Weeding Time (Man Hours/A)	Yield (cwt/A)
	1 true leaf 5/24/07	2 true leaf 6/4/07	6/4/07	6/18/07	6/20/07	10/4/07
1	Goal @ 2 oz/A	Goal @ 4 oz/A	9.0	9.3	10.3	358
2	--	Goal @ 4 oz/A	1.0	7.8	18.8	380
3	Goal @ 1 oz/A Outlook @ 5.25 oz/A Prowl @ 2 pt/A	Goal @ 2 oz/A Outlook @ 5.25 oz/A	6.5	7.0	34.7	354
4	Goal @ 1.5 oz/A Outlook @ 7.9 oz/A Prowl @ 3 pt/A	Goal @ 3 oz/A Outlook @ 7.9 oz/A	6.5	8.0	16.6	336
5	Goal @ 2 oz/A Outlook @ 10.5 oz/A Prowl @ 4 pt/A	Goal @ 4 oz/A Outlook @ 10.5 oz/A	8.3	8.9	14.8	330
6	Goal @ 3 oz/A Outlook @ 15.75 oz/A Prowl @ 6 pt/A	Goal @ 6 oz/A Outlook @ 15.75 oz/A	9.1	10.0	4.6	341
7	Goal @4 oz/A Outlook @ 21 oz/A Prowl @ 8 pt/A	Goal @ 8 oz/A Outlook @ 21 oz/A	9.5	10.0	4.5	372
8	Goal @ 2 oz/A Outlook @ 10.5 oz/A	Goal @ 4 oz/A Outlook @ 10.5 oz/A	7.8	8.6	13.3	380
9	Goal @ 2 oz/A Prowl @ 4 pt/A	Goal @ 4 oz/A	8.3	9.1	12.9	339
10	Prowl @ 4 pt/A	Goal @ 4 oz/A Outlook @ 21 oz/A	1.8	8.4	20.5	375
11	Hand Weeded Control		1.8	9.3	10.4*	340
12	Non-weeded Control		0.5	0.0	---	---
		Mean	5.82	8.02	14.7	355
		LSD (0.05)	1.57	0.89	62.1	NS
		CV%	18.69	7.67	13.1	12.37

2007 Tulelake Herbicide Chemigation Trial in Dehydrator Onions

Treatment #	Herbicide Application		Weed Control Rating (0-10, 10=100% control)		Weeding Time (Man Hours/A)	Yield (cwt/A)
	1 true leaf 5/24/07	2 true leaf 6/4/07	6/4/07	6/18/07	6/20/07	10/4/07
1	Goal @ 2 oz/A	Goal @ 4 oz/A	9.0	9.3	10.3	358
2	--	Goal @ 4 oz/A	1.0	7.8	18.8	380
3	Goal @ 1 oz/A Outlook @ 5.25 oz/A Prowl @ 2 pt/A	Goal @ 2 oz/A Outlook @ 5.25 oz/A	6.5	7.0	34.7	354
4	Goal @ 1.5 oz/A Outlook @ 7.9 oz/A Prowl @ 3 pt/A	Goal @ 3 oz/A Outlook @ 7.9 oz/A	6.5	8.0	16.6	336
5	Goal @ 2 oz/A Outlook @ 10.5 oz/A Prowl @ 4 pt/A	Goal @ 4 oz/A Outlook @ 10.5 oz/A	8.3	8.9	14.8	330
6	Goal @ 3 oz/A Outlook @ 15.75 oz/A Prowl @ 6 pt/A	Goal @ 6 oz/A Outlook @ 15.75 oz/A	9.1	10.0	4.6	341
7	Goal @4 oz/A Outlook @ 21 oz/A Prowl @ 8 pt/A	Goal @ 8 oz/A Outlook @ 21 oz/A	9.5	10.0	4.5	372
8	Goal @ 2 oz/A Outlook @ 10.5 oz/A	Goal @ 4 oz/A Outlook @ 10.5 oz/A	7.8	8.6	13.3	380
9	Goal @ 2 oz/A Prowl @ 4 pt/A	Goal @ 4 oz/A	8.3	9.1	12.9	339
10	Prowl @ 4 pt/A	Goal @ 4 oz/A Outlook @ 21 oz/A	1.8	8.4	20.5	375
11	Hand Weeded Control		1.8	9.3	10.4*	340
12	Non-weeded Control		0.5	0.0	---	---
		Mean	5.82	8.02	14.7	355
		LSD (0.05)	1.57	0.89	62.1	NS
		CV%	18.69	7.67	13.1	12.37

Figure 2. Visual representation of chemical distribution in a field resulting from chemication through solid set sprinklers. In this typical example, impact sprinklers with 7/64" nozzles were used with sprinklers spaced 40' along the lateral and 60 feet between laterals. Red lines illustrate location of the lateral pipe and the red stars indicate sprinkler head locations. The colors code for the percentage of chemical applied in each area of the field. Note some areas received as little as 50 % of the target application and other areas received nearly 200% of the average or target application. Improvements in sprinkler system design (sprinkler type and spacing) can greatly improve distribution uniformity and reduce over and under application



Percentage of Target Chemical Applied

50-70 70-90 90-110 110-130 130-150 150-170 170-190 190-200