

Table 1. Irrigation return flow volume and concentration of contaminants in surface and subsurface irrigation return flow for Round 1 beginning July 30, 2019.

Treatment	Days After Application				
	1	2	4	8	16
Surface Irrigation Return Flow (Liters per 400 ft <sup>2</sup> Bed)					
Control	302 ± 35	179 ± 56	333 ± 27	296 ± 56	357 ± 15
DWU100	93 ± 71	64 ± 34	169 ± 70	205 ± 75	217 ± 65
DWU100-75	46 ± 23	6 ± 6	139 ± 21	145 ± 75	48 ± 24
SS CC	20 ± 20	18 ± 12	12 ± 12	30 ± 30	18 ± 10
SS Sensor	22 ± 11	4 ± 4	8 ± 8	10 ± 5	0
Subsurface Irrigation Return Flow (Liters per 400 ft <sup>2</sup> Bed)					
Control	52 ± 46	6 ± 6	26 ± 9	18 ± 9	30 ± 9
DWU100	32 ± 4	14 ± 7	46 ± 23	52 ± 16	40 ± 11
DWU100-75	34 ± 19	16 ± 4	32 ± 20	64 ± 31	68 ± 21
SS CC	34 ± 28	20 ± 20	44 ± 44	36 ± 25	22 ± 12
SS Sensor	28 ± 13	14 ± 9	32 ± 4	28 ± 7	14 ± 9
NO <sub>3</sub> Concentration (mg L <sup>-1</sup> ) in Surface Irrigation Return Flow					
Control	5.1 ± 2.8	2.8 ± 0.6	5.2 ± 2.5	4.2 ± 1.4	2.3 ± 0.8
DWU100	0.9 ± 0.5	1.4 ± 0.4	2.2 ± 0.9	1.2 ± 0.3	0.8 ± 0.2
DWU100-75	1.2 ± 0.6	0.5 ± 0.5	1.6 ± 0.2	0.9 ± 0.6	0.7 ± 0.2
SS CC	1.5 ± 1.5	1.8 ± 1.0	0.4 ± 0.4	3.4 ± 3.4	0.5 ± 0.3
SS Sensor	2.0 ± 1.4	2.1 ± 2.1	2.0 ± 2.0	7.0 ± 5.4	0
NO <sub>3</sub> Concentration (mg L <sup>-1</sup> ) in Subsurface Irrigation Return Flow					
Control	2.2 ± 2.1	2.3 ± 2.3	2.2 ± 2.1	1.9 ± 1.9	0.1 ± 0.1
DWU100	0.7 ± 0.3	0.3 ± 0.3	0.6 ± 0.2	0.2 ± 0.1	0.3 ± 0.2
DWU100-75	0.9 ± 0.7	0.1 ± 0.1	1.7 ± 0.4	1.0 ± 0.4	0.7 ± 0.2
SS CC	0.6 ± 0.5	0.2 ± 0.2	0.4 ± 0.4	0.4 ± 0.2	0.8 ± 0.7
SS Sensor	3.1 ± 2.6	2.0 ± 1.9	4.6 ± 4.4	3.4 ± 2.4	0.6 ± 0.5
PO <sub>4</sub> Concentration (mg L <sup>-1</sup> ) in Surface Irrigation Return Flow					
Control	0.3 ± 0.2	0.1 ± 0.1	0.2 ± 0.1	0.2 ± 0.1	0.1 ± 0.1
DWU100	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1
DWU100-75	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	0.2 ± 0.2	0.1 ± 0.1
SS CC	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	0.4 ± 0.4
SS Sensor	0.1 ± 0.1	0.3 ± 0.1	0.1 ± 0.1	0.3 ± 0.2	0
PO <sub>4</sub> Concentration (mg L <sup>-1</sup> ) in Subsurface Irrigation Return Flow					
Control	0.1	0.1	0.1	0.1	0.1
DWU100	0.1	0.1	0.1	0.1	0.1
DWU100-75	0.1	0.1	0.1	0.1	0.1
SS CC	0.1	0.1	0.1	0.1	0.1
SS Sensor	0.1	0.1	0.1	0.1	0.1

Acephate Concentration ( $\mu\text{g L}^{-1}$ ) in Surface Irrigation Return Flow

Control	309.2 ± 17.9	94.0 ± 15.5	29.4 ± 5.3	6.0 ± 1.9	1.1 ± 0.2
DWU100	120.8 ± 78.9	168.4 ± 92.9	29.6 ± 13.4	3.6 ± 2.6	1.9 ± 1.0
DWU100-75	193.1 ± 112.7	35.7 ± 35.6	83.3 ± 24.8	1.1 ± 0.6	0.9 ± 0.1
SS CC	111.9 ± 111.9	111.1 ± 56.2	14.2 ± 14.2	2.0 ± 2.0	0.6 ± 0.3
SS Sensor	86.6 ± 86.2	50.4 ± 50.4	17.5 ± 17.5	3.7 ± 2.1	0

Acephate Concentration ( $\mu\text{g L}^{-1}$ ) in Subsurface Irrigation Return Flow

Control	10.1 ± 9.7	61.0 ± 60.1	58.3 ± 21.1	10.7 ± 10.7	0.9 ± 0.1
DWU100	44.4 ± 19.0	37.4 ± 37.4	34.7 ± 4.5	1.3 ± 0.4	0.9 ± 0.1
DWU100-75	115.6 ± 60.2	163.3 ± 80.4	85.1 ± 30.5	12.1 ± 5.1	2.8 ± 1.7
SS CC	76.6 ± 55.1	36.1 ± 36.1	9.7 ± 9.7	4.0 ± 2.5	0.6 ± 0.3
SS Sensor	117.0 ± 63.5	47.0 ± 46.6	29.4 ± 28.5	9.4 ± 5.9	1.5 ± 1.1

Isoxaben Concentration ( $\mu\text{g L}^{-1}$ ) in Surface Irrigation Return Flow

Control	63.2 ± 29.9	36.4 ± 22.0	9.6 ± 6.5	6.9 ± 6.0	0.9 ± 0.1
DWU100	35.5 ± 21.1	68.7 ± 30.2	9.8 ± 3.7	3.6 ± 1.5	0.9 ± 0.1
DWU100-75	71.3 ± 38.9	11.7 ± 11.7	26.5 ± 11.8	2.2 ± 1.7	0.9 ± 0.1
SS CC	35.2 ± 35.2	66.1 ± 41.2	8.5 ± 8.5	5.5 ± 5.5	0.6 ± 0.3
SS Sensor	85.0 ± 42.7	28.2 ± 28.2	4.4 ± 4.4	8.9 ± 8.5	0

Isoxaben Concentration ( $\mu\text{g L}^{-1}$ ) in Subsurface Irrigation Return Flow

Control	0.6 ± 0.3	3.1 ± 3.1	4.8 ± 2.8	1.3 ± 1.3	0.9 ± 0.1
DWU100	6.0 ± 4.4	6.4 ± 6.4	8.3 ± 3.9	0.9 ± 0.1	0.9 ± 0.1
DWU100-75	27.2 ± 13.9	24.4 ± 12.2	19.4 ± 9.5	2.2 ± 0.8	0.9 ± 0.1
SS CC	14.4 ± 14.0	11.0 ± 11.0	4.0 ± 4.0	0.6 ± 0.3	0.6 ± 0.3
SS Sensor	52.7 ± 7.1	26.6 ± 13.5	10.2 ± 1.7	1.0 ± 0.1	1.3 ± 0.8

Triflumizole Concentration ( $\mu\text{g L}^{-1}$ ) in Surface Irrigation Return Flow

Control	87.6 ± 14.8	28.6 ± 1.2	18.6 ± 3.3	2.0 ± 0.7	1.1 ± 0.2
DWU100	26.6 ± 19.5	41.8 ± 18.0	17.5 ± 4.3	2.1 ± 0.6	0.9 ± 0.1
DWU100-75	36.0 ± 26.6	0.3 ± 0.3	29.4 ± 4.6	1.6 ± 0.8	1.3 ± 0.4
SS CC	10.9 ± 10.9	9.9 ± 5.5	3.6 ± 3.6	1.3 ± 1.3	0.6 ± 0.3
SS Sensor	12.5 ± 12.1	4.7 ± 4.7	4.3 ± 4.3	1.6 ± 0.8	0

Triflumizole Concentration ( $\mu\text{g L}^{-1}$ ) in Subsurface Irrigation Return Flow

Control	0.6 ± 0.3	0.3 ± 0.3	0.9 ± 0.1	0.5 ± 0.5	0.9 ± 0.1
DWU100	0.9 ± 0.1	0.5 ± 0.5	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1
DWU100-75	0.9 ± 0.1	0.9 ± 0.1	3.5 ± 2.6	0.9 ± 0.1	0.9 ± 0.1
SS CC	1.1 ± 0.7	2.7 ± 2.7	2.7 ± 2.7	0.6 ± 0.3	0.6 ± 0.3
SS Sensor	1.2 ± 0.3	3.3 ± 2.9	5.2 ± 4.3	1.1 ± 0.2	0.6 ± 0.3

Bifenthrin Concentration ( $\mu\text{g L}^{-1}$ ) in Subsurface Irrigation Return Flow

Control	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1
DWU100	0.6 ± 0.3	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1
DWU100-75	0.6 ± 0.3	0.3 ± 0.3	0.9 ± 0.1	0.6 ± 0.3	0.9 ± 0.1

SS CC	$0.3 \pm 0.3$	$0.6 \pm 0.3$	$0.3 \pm 0.3$	$0.3 \pm 0.3$	$0.6 \pm 0.3$
SS Sensor	$0.6 \pm 0.3$	$0.3 \pm 0.3$	$0.3 \pm 0.3$	$0.6 \pm 0.3$	0

Bifenthrin Concentration ( $\mu\text{g L}^{-1}$ ) in Subsurface Irrigation Return Flow

Control	$0.6 \pm 0.3$	$0.3 \pm 0.3$	$0.9 \pm 0.1$	$0.5 \pm 0.5$	$0.9 \pm 0.1$
DWU100	$0.9 \pm 0.1$	$0.5 \pm 0.5$	$0.9 \pm 0.1$	$0.9 \pm 0.1$	$0.9 \pm 0.1$
DWU100-75	$0.9 \pm 0.1$	$0.9 \pm 0.1$	$0.9 \pm 0.1$	$0.9 \pm 0.1$	$0.9 \pm 0.1$
SS CC	$0.6 \pm 0.3$	$0.3 \pm 0.3$	$0.3 \pm 0.3$	$0.6 \pm 0.3$	$0.6 \pm 0.3$
SS Sensor	$0.9 \pm 0.1$	$0.6 \pm 0.3$	$0.9 \pm 0.1$	$0.9 \pm 0.1$	$0.6 \pm 0.3$

Table 2. Irrigation return flow volume and concentration of contaminants in surface and subsurface irrigation return flow for Round 2 beginning August 19, 2019.

Treatment	Days After Application				
	1	2	4	8	16
	Surface Irrigation Return Flow (Liters per 400 ft <sup>2</sup> Bed)				
Control	246 ± 55	349 ± 23	144 ± 81	330 ± 49	379
DWU100	191 ± 53	217 ± 66	125 ± 36	253 ± 126	279 ± 95
DWU100-75	52 ± 25	40 ± 22	12 ± 12	218 ± 113	40 ± 29
SS CC	30 ± 15	79 ± 46	22 ± 22	368 ± 11	97 ± 54
SS Sensor	141 ± 59	10 ± 10	0	379 ± 0	54 ± 16
	Subsurface Irrigation Return Flow (Liters per 400 ft <sup>2</sup> Bed)				
Control	32 ± 17	22 ± 12	24	153 ± 49	83 ± 25
DWU100	50 ± 16	50 ± 12	38 ± 11	183 ± 69	58 ± 20
DWU100-75	68 ± 21	64 ± 21	32 ± 5	220 ± 80	109 ± 42
SS CC	62 ± 62	68 ± 62	0	8 ± 8	20 ± 20
SS Sensor	20 ± 14	18 ± 9	6 ± 6	76 ± 33	42 ± 24
	NO <sub>3</sub> Concentration (mg L <sup>-1</sup> ) in Surface Irrigation Return Flow				
Control	0.67 ± 0.30	1.60 ± 0.28	0.95 ± 0.36	0.95 ± 0.06	0.44 ± 0.07
DWU100	0.50 ± 0.02	1.05 ± 0.26	0.79 ± 0.17	0.43 ± 0.06	0.42 ± 0.08
DWU100-75	1.05 ± 0.30	0.98 ± 0.74	0.43 ± 0.43	0.91 ± 0.70	0.37 ± 0.19
SS CC	1.20 ± 0.81	0.84 ± 0.73	0.34 ± 0.34	1.25 ± 1.10	0.62 ± 0.49
SS Sensor	3.72 ± 1.49	3.87 ± 3.87	0	2.96 ± 1.03	1.42 ± 0.60
	NO <sub>3</sub> Concentration (mg L <sup>-1</sup> ) in Subsurface Irrigation Return Flow				
Control	0.54 ± 0.49	1.18 ± 1.18	0.71 ± 0.59	0.54 ± 0.10	0.23 ± 0.04
DWU100	1.04 ± 0.95	2.45 ± 2.30	1.00 ± 0.91	1.05 ± 0.96	2.17 ± 2.05
DWU100-75	0.76 ± 0.18	1.64 ± 0.34	0.96 ± 0.54	0.94 ± 0.53	0.61 ± 0.20
SS CC	0.09 ± 0.09	0.39 ± 0.22	0	0.04 ± 0.04	0.04 ± 0.04
SS Sensor	0.78 ± 0.59	1.11 ± 1.11	0.11 ± 0.11	2.03 ± 0.75	1.01 ± 0.52
	PO <sub>4</sub> Concentration (mg L <sup>-1</sup> ) in Surface Irrigation Return Flow				
Control	0.10 ± 0.03	0.07 ± 0.02	0.11 ± 0.11	0.07 ± 0.04	0.03 ± 0.01
DWU100	0.07 ± 0.02	0.05 ± 0.01	0.02 ± 0.01	0.05 ± 0.01	0.04 ± 0.01
DWU100-75	0.21 ± 0.08	0.08 ± 0.04	0	0.04 ± 0.03	0.04 ± 0.02
SS CC	0.40 ± 0.22	0.07 ± 0.05	0.05 ± 0.05	0.08 ± 0.01	0.08 ± 0.04
SS Sensor	0.49 ± 0.07	0.13 ± 0.13	0	0.11 ± 0.04	0.16 ± 0.05
	PO <sub>4</sub> Concentration (mg L <sup>-1</sup> ) in Subsurface Irrigation Return Flow				
Control	0.09 ± 0.04	0.11 ± 0.11	0.27 ± 0.24	0.06 ± 0.03	0.05 ± 0.01
DWU100	0.05 ± 0.03	0.04 ± 0.03	0.02 ± 0.01	0.02 ± 0.01	0.03 ± 0.01
DWU100-75	0.11 ± 0.06	0.09 ± 0.04	0.04 ± 0.01	0.03 ± 0.02	0.03 ± 0.01
SS CC	0.04 ± 0.04	0.27 ± 0.26	0	0.01 ± 0.01	0.01 ± 0.01
SS Sensor	0.28 ± 0.17	0.06 ± 0.06	0.10 ± 0.10	0.04 ± 0.02	0.02 ± 0.01

Acephate Concentration ( $\mu\text{g L}^{-1}$ ) in Surface Irrigation Return Flow

Control	668.7 $\pm$ 17.8	80.0 $\pm$ 15.0	7.5 $\pm$ 1.5	17.9 $\pm$ 5.3	0.9
DWU100	493.7 $\pm$ 188.1	95.8 $\pm$ 55.1	20.3 $\pm$ 19.4	7.6 $\pm$ 6.2	0.9
DWU100-75	771.1 $\pm$ 188.7	76.0 $\pm$ 43.8	0.8 $\pm$ 0.8	7.5 $\pm$ 4.0	0.6 $\pm$ 0.3
SS CC	319.2 $\pm$ 202.1	55.1 $\pm$ 39.3	2.9 $\pm$ 2.9	44.6 $\pm$ 28.2	0.6 $\pm$ 0.3
SS Sensor	553.9 $\pm$ 54.5	39.5 $\pm$ 39.5	0	31.4 $\pm$ 12.6	1.2 $\pm$ 0.3

Acephate Concentration ( $\mu\text{g L}^{-1}$ ) in Subsurface Irrigation Return Flow

Control	120.7 $\pm$ 65.6	140.6 $\pm$ 140.6	30.2 $\pm$ 8.4	7.0 $\pm$ 1.6	8.8 $\pm$ 5.5
DWU100	61.4 $\pm$ 7.6	45.6 $\pm$ 15.5	6.2 $\pm$ 2.8	7.3 $\pm$ 6.4	1.1 $\pm$ 0.2
DWU100-75	339.3 $\pm$ 209.1	108.1 $\pm$ 42.7	32.1 $\pm$ 7.6	7.7 $\pm$ 6.8	6.1 $\pm$ 3.5
SS CC	45.7 $\pm$ 45.7	23.7 $\pm$ 13.0	0	2.9 $\pm$ 2.9	0.3 $\pm$ 0.3
SS Sensor	133.3 $\pm$ 132.9	14.3 $\pm$ 14.3	1.1 $\pm$ 1.1	6.3 $\pm$ 4.3	0.3 $\pm$ 0.3

Prodiamine Concentration ( $\mu\text{g L}^{-1}$ ) in Surface Irrigation Return Flow

Control	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	1.1 $\pm$ 0.2
DWU100	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1
DWU100-75	0.9 $\pm$ 0.1	0.6 $\pm$ 0.3	0.3 $\pm$ 0.3	0.6 $\pm$ 0.3	0.6 $\pm$ 0.3
SS CC	0.6 $\pm$ 0.3	0.6 $\pm$ 0.3	0.3 $\pm$ 0.3	0.9 $\pm$ 0.1	0.6 $\pm$ 0.3
SS Sensor	0.9 $\pm$ 0.1	0.3 $\pm$ 0.3	0	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1

Prodiamine Concentration ( $\mu\text{g L}^{-1}$ ) in Subsurface Irrigation Return Flow

Control	0.6 $\pm$ 0.3	0.5 $\pm$ 0.4	0.9 $\pm$ 0.1	1.0 $\pm$ 0.1	0.9 $\pm$ 0.1
DWU100	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1
DWU100-75	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1
SS CC	0.3 $\pm$ 0.3	0.6 $\pm$ 0.3	0	0.3 $\pm$ 0.3	0.3 $\pm$ 0.3
SS Sensor	0.6 $\pm$ 0.3	0.5 $\pm$ 0.4	0.3 $\pm$ 0.3	0.9 $\pm$ 0.1	0.6 $\pm$ 0.3

Bifenthrin Concentration ( $\mu\text{g L}^{-1}$ ) in Surface Irrigation Return Flow

Control	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1
DWU100	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1
DWU100-75	0.9 $\pm$ 0.1	0.6 $\pm$ 0.3	0.3 $\pm$ 0.3	0.6 $\pm$ 0.3	0.6 $\pm$ 0.3
SS CC	0.6 $\pm$ 0.3	0.6 $\pm$ 0.3	0.3 $\pm$ 0.3	0.9 $\pm$ 0.1	0.6 $\pm$ 0.3
SS Sensor	0.9 $\pm$ 0.1	0.3 $\pm$ 0.3	0	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1

Bifenthrin Concentration ( $\mu\text{g L}^{-1}$ ) in Subsurface Irrigation Return Flow

Control	0.6 $\pm$ 0.3	0.5 $\pm$ 0.4	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1
DWU100	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1
DWU100-75	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1
SS CC	0.3 $\pm$ 0.3	0.6 $\pm$ 0.3	0	0.3 $\pm$ 0.3	0.3 $\pm$ 0.3
SS Sensor	0.6 $\pm$ 0.3	0.5 $\pm$ 0.4	0.3 $\pm$ 0.3	0.9 $\pm$ 0.1	0.6 $\pm$ 0.3

Mefenoxam Concentration ( $\mu\text{g L}^{-1}$ ) in Surface Irrigation Return Flow

Control	46.8 $\pm$ 3.2	4.7 $\pm$ 0.7	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1
DWU100	29.6 $\pm$ 12.8	6.3 $\pm$ 3.0	1.5 $\pm$ 0.6	0.9 $\pm$ 0.1	0.9 $\pm$ 0.1

DWU100-75	59.6 ± 15.7	3.7 ± 2.4	0.3 ± 0.3	0.6 ± 0.3	0.6 ± 0.3
SS CC	28.8 ± 20.6	4.6 ± 4.2	0.4 ± 0.4	8.2 ± 7.3	0.6 ± 0.3
SS Sensor	42.6 ± 2.9	2.4 ± 2.4	0	5.2 ± 3.1	0.9 ± 0.1

Mefenoxam Concentration ( $\mu\text{g L}^{-1}$ ) in Subsurface Irrigation Return Flow

Control	1.8 ± 1.4	9.5 ± 9.5	1.4 ± 0.5	0.9 ± 0.1	0.9 ± 0.1
DWU100	0.9 ± 0.1	1.2 ± 0.3	0.9 ± 0.1	0.9 ± 0.1	0.9 ± 0.1
DWU100-75	17.2 ± 14.6	7.1 ± 2.5	4.0 ± 2.7	0.9 ± 0.1	0.9 ± 0.1
SS CC	1.9 ± 1.9	0.6 ± 0.3	0	0.3 ± 0.3	0.3 ± 0.3
SS Sensor	9.4 ± 8.9	0.5 ± 0.5	0.3 ± 0.3	1.1 ± 0.2	0.6 ± 0.3