Average Application Efficiencies
for Center Pivots in Eastern Oregon and Washington

IRZ Consulting has been involved in improving water management on irrigated farms in eastern Oregon and Washington for over twenty-five years. In 2007 IRZ monitored and provided irrigation scheduling information for over 100,000 acres of irrigated ground, most of which was center pivots. Over the years, the type and amount of information gathered has expanded. And though the data gathering has not been for research, the data gathered can be used to draw general conclusions from.

The monitoring IRZ does will include the weekly measurement of soil moistures, the depth of water reaching the ground, and the amount of water applied through the pivot. Presented here is a summary of information gathered during 2007 for forty randomly selected pivots. Each table shows the gross weekly application based on pivot package and run hours, the net application from rain gauges, and the resulting application efficiency for one pivot. The weekly efficiencies can vary significantly from under 50% to over 100%. The reason for these variations is the timing of measurements. When averaged over the season these timing issues are eliminated and the true average application efficiency is determined.

The forty fields selected represent eleven different crops including alfalfa, canola, carrot, both sweet and field corn, lima beans, onion, peas, potato, ryegrass, and winter wheat. Three of the fields were double cropped with peas followed by sweet corn. There is a noted difference between different crops and the average application efficiency achieved. For carrot, potato, lima beans, onion, and corn (twenty-four fields) the overall average application efficiency was 85%. For the other crops (sixteen fields) the overall average application efficiency was only 79%. The primary reason for these lower efficiencies is associated with the relative value of the crops. For the higher valued crops, more care is taken and sprinkler packages are changed more often.

For each field a set of graphs are also included. These graphs show the measured soil moisture at one, two, and three foot levels as well as the composite for the total three foot root zone. Note that three fields included were monitored to the five foot level. Each graph shows, along with the measured soil moisture, the field capacity, wilting point, and crop stress line. These levels are determined at each site and for each depth at the time the site is installed. The general observation from these graphs is that with proper irrigation scheduling, the soil moisture can be kept below the field capacity. This means that the amount of water moving through and out the bottom of the root zone will be very small.

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Tabular Data

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Summary of Fields

Field	Crop	Application Efficiency
1	Alfalfa	85%
2	Ryegrass	81%
3	Carrot	88%
4	Alfalfa	80%
5	Winter Wheat	84%
6	Potato	84%
7	Potato	85%
8	Sweet Corn	89%
9	Sweet Corn	84%
10	Sweet Corn	83%
11	Lima Beans	77%
12	Sweet Corn	93%
13	Sweet Corn	86%
14	Lima Beans	89%
15	Ryegrass	84%
16	Peas	75%
17	Sweet Corn	74%
18	Ryegrass	73%
19	Winter Wheat	79%
20	Carrot	92%

Field	Crop	Application Efficiency
21	Alfalfa	81%
22	Field Corn	90%
23	Canola	74%
24	Peas	78%
25	Sweet Corn	81%
26	Ryegrass	80%
27	Onion	80%
28	Dehy Onion	89%
29	Onion	76%
30	Onion	82%
31	Onion	84%
32	Field Corn	90%
33	Field Corn	86%
34	Potato	93%
35	Sweet Corn	76%
36	Winter Wheat	82%
37	Sweet Corn	83%
38	Peas/Sweet Corn	74%
39	Peas/Sweet Corn	79%
40	Peas/Sweet Corn	77%

Average Efficiency for All Fields	83%
Average Efficiency for Carrot, Corn, Bean, Onion, and Potato Fields	85%
Average Efficiency for Alfalfa, Canola, Pea, Ryegrass, and Wheat Fields	79%

Field ID: 1

Crop: Alfalfa

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
15-Mar	0.30	0.19	64%
22-Mar	0.80	0.60	75%
29-Mar	0.33	0.16	48%
5-Apr	0.91	0.80	88%
12-Apr	1.21	1.09	90%
19-Apr	0.73	0.53	73%
26-Apr	2.05	1.66	81%
3-May	0.63	0.33	52%
10-May	0.00	0.00	
17-May	1.97	1.55	79%
24-May	2.00	1.71	85%
31-May	2.20	2.20	100%
7-Jun	2.50	2.21	88%
14-Jun	0.08	0.00	
21-Jun	0.83	0.85	103%
28-Jun	2.50	2.10	84%
5-Jul	2.37	2.10	89%
12-Jul	2.44	2.23	92%
19-Jul	2.77	2.27	82%
26-Jul	1.71	1.75	103%
2-Aug	0.00	0.00	
9-Aug	1.06	0.89	84%
16-Aug	2.80	2.80	100%
23-Aug	2.37	2.37	100%
30-Aug	2.37	2.33	98%
6-Sep	1.67	1.50	90%
13-Sep	0.00	0.00	
20-Sep	0.00	0.00	
27-Sep	1.86	1.87	101%
4-Oct	1.61	1.36	85%
11-Oct	1.08	0.88	82%
18-Oct	0.08	0.07	84%

Average Efficiency	85%

Field ID: 2

Crop: Ryegrass

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
14-Mar	0.40	0.00	
21-Mar	0.60	0.40	67%
28-Mar	1.10	0.86	78%
4-Apr	0.60	0.45	75%
11-Apr	1.00	0.79	79%
18-Apr	0.80	0.78	98%
25-Apr	1.40	1.36	97%
2-May	1.30	0.93	72%
9-May	1.30	1.23	95%
16-May	2.00	1.75	88%
23-May	2.50	1.86	74%
30-May	2.10	2.10	100%
6-Jun	2.40	1.96	82%
13-Jun	2.10	1.27	60%
20-Jun	2.20	1.85	84%
27-Jun	2.50	1.65	66%
4-Jul	2.40	2.15	90%

Average Efficiency	81%

Field ID: 3

Crop: Carrot

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
20-Jun	1.10	0.52	47%
27-Jun	1.30	0.91	70%
4-Jul	2.90	2.45	84%
11-Jul	2.40	2.33	97%
18-Jul	2.50	1.92	77%
25-Jul	1.50	1.50	100%
1-Aug	2.40	2.17	90%
8-Aug	2.20	2.04	93%
15-Aug	2.50	2.00	80%
22-Aug	1.70	1.42	84%
29-Aug	1.40	1.43	102%
5-Sep	0.50	0.65	130%

Average Efficiency	88%

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Field ID: 4

Crop: Alfalfa

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
15-Mar	0.10	0.04	
22-Mar	0.43	0.35	82%
29-Mar	0.81	0.86	106%
5-Apr	0.74	0.45	60%
12-Apr	1.52	1.24	82%
19-Apr	1.68	1.18	70%
26-Apr	1.36	1.01	74%
3-May	0.09	0.03	33%
10-May	0.37	0.33	88%
17-May	1.98	1.55	78%
24-May	1.28	1.06	83%
31-May	0.86	0.55	64%
7-Jun	1.00	0.66	66%
14-Jun	0.00	0.00	
21-Jun	0.38	0.35	91%
28-Jun	1.94	1.65	85%
5-Jul	1.89	1.50	80%
12-Jul	0.84	0.88	105%
19-Jul	2.64	2.42	92%
26-Jul	2.17	1.80	83%
2-Aug	0.45	0.32	71%
9-Aug	0.01	0.00	
16-Aug	1.20	1.00	83%
23-Aug	2.37	2.27	96%
30-Aug	1.94	1.83	94%
6-Sep	1.60	1.40	88%
13-Sep	2.34	1.80	77%
20-Sep	0.93	0.53	57%
27-Sep	0.13	0.12	92%
4-Oct	0.00	0.00	
11-Oct	0.00	0.00	
18-Oct	0.03	0.02	70%
25-Oct	0.62	0.58	94%

Average Efficiency	80%

Field ID: 5

Crop: Winter Wheat

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
21-Mar	1.00	0.50	50%
28-Mar	0.00	0.06	
4-Apr	0.30	0.25	83%
11-Apr	1.10	0.94	85%
18-Apr	1.10	1.13	103%
25-Apr	2.00	1.46	73%
2-May	1.60	1.43	89%
9-May	2.20	1.78	81%
16-May	2.30	2.25	98%
23-May	2.10	1.81	86%
30-May	2.20	1.85	84%
6-Jun	1.20	1.31	109%
13-Jun	2.30	1.82	79%
20-Jun	1.50	1.30	87%
27-Jun	0.70	0.50	71%
4-Jul	0.50	0.40	80%

Average Efficiency	84%

Field ID: 6

Crop: Potato

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
23-May	2.00	1.11	56%
30-May	2.30	1.95	85%
6-Jun	2.40	2.11	88%
13-Jun	1.80	1.57	87%
20-Jun	2.50	2.35	94%
27-Jun	2.30	2.00	87%
4-Jul	2.90	2.25	78%
11-Jul	2.20	2.18	99%
18-Jul	2.50	2.42	97%
25-Jul	2.00	1.50	75%
1-Aug	2.60	2.12	82%
8-Aug	2.10	2.04	97%
15-Aug	2.30	2.20	96%
22-Aug	1.80	1.62	90%
29-Aug	1.40	1.33	95%
5-Sep	1.60	1.20	75%
12-Sep	0.60	0.30	50%

Average Efficiency	84%

Field ID: 7

Crop: Potato

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
18-May	2.60	1.60	62%
25-May	2.50	1.76	70%
1-Jun	2.20	2.00	91%
8-Jun	2.40	2.16	90%
15-Jun	1.80	1.52	84%
22-Jun	2.00	1.90	95%
29-Jun	2.80	2.65	95%
6-Jul	2.70	2.20	81%
13-Jul	2.30	2.23	97%

Average Efficiency	85%

Field ID: 8

Crop: Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
24-Jul	1.80	1.10	61%
31-Jul	1.90	1.44	76%
7-Aug	2.00	1.58	79%
14-Aug	2.20	2.40	109%
21-Aug	1.80	1.07	59%
28-Aug	1.20	1.47	123%
4-Sep	1.00	0.99	99%
11-Sep	0.90	0.85	94%
18-Sep	0.80	0.77	96%

Average Efficiency	89%

Field ID: 9

Crop: Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
24-Jul	1.20	1.05	88%
31-Jul	1.40	1.44	103%
7-Aug	1.60	1.08	68%
14-Aug	2.20	2.00	91%
21-Aug	2.00	1.57	79%
28-Aug	1.00	0.97	97%
4-Sep	1.00	0.84	84%
11-Sep	0.90	0.90	100%
18-Sep	1.00	0.52	52%

Average Efficiency	84%

Field ID: 10

Crop: Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
23-Jul	1.20	0.95	79%
30-Jul	1.80	1.42	79%
6-Aug	1.80	2.70	150%
13-Aug	2.30	1.49	65%
20-Aug	2.10	1.93	92%
27-Aug	2.00	1.47	74%
3-Sep	2.10	1.65	79%
10-Sep	1.30	1.25	96%
17-Sep	1.80	1.13	63%
24-Sep	1.40	1.02	73%
1-Oct	0.60	0.37	62%
8-Oct	0.30	0.26	87%

Average Efficiency	83%

Field ID: 11

Crop: Lima Beans

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
16-Jul	1.50	1.15	77%
23-Jul	1.70	1.12	66%
30-Jul	1.90	1.02	54%
6-Aug	2.30	1.70	74%
13-Aug	2.20	1.44	65%
20-Aug	2.30	2.48	108%
27-Aug	1.30	1.07	82%
3-Sep	0.60	0.25	42%
10-Sep	1.20	1.20	100%
17-Sep	1.60	0.78	49%
24-Sep	1.50	1.32	88%
1-Oct	0.50	0.62	124%

Average Efficiency	77%

Field ID: 12

Crop: Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
23-Jul	2.00	2.07	104%
30-Jul	2.40	1.72	72%
6-Aug	2.00	1.95	98%
13-Aug	2.00	1.84	92%
20-Aug	2.30	2.23	97%
27-Aug	1.70	1.52	89%
3-Sep	0.80	0.80	100%

Average Efficiency	93%

Field ID: 13

Crop: Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
16-Jul	2.00	1.20	60%
23-Jul	1.90	1.72	91%
30-Jul	2.20	2.02	92%
6-Aug	2.50	2.20	88%
13-Aug	1.90	1.29	68%
20-Aug	1.90	2.13	112%
27-Aug	1.90	1.37	72%
3-Sep	0.80	0.75	94%
10-Sep	1.00	0.95	95%

Average Efficiency	86%

Field ID: 14

Crop: Lima Beans

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
16-Jul	0.90	0.60	67%
23-Jul	2.00	1.57	79%
30-Jul	2.10	1.92	91%
6-Aug	2.30	1.85	80%
13-Aug	2.30	2.49	108%
20-Aug	2.70	2.18	81%
27-Aug	1.20	1.02	85%
3-Sep	0.60	0.75	125%
10-Sep	1.50	1.35	90%
17-Sep	1.50	1.23	82%
24-Sep	1.80	1.62	90%
1-Oct	0.60	0.57	95%

Average Efficiency	89%

Field ID: 15

Crop: Ryegrass

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
14-Mar	0.90	0.59	66%
21-Mar	0.40	0.35	88%
28-Mar	0.40	0.35	88%
4-Apr	0.40	0.40	100%
11-Apr	1.00	0.69	69%
18-Apr	1.00	1.08	108%
25-Apr	0.90	0.81	90%
2-May	1.60	1.18	74%
9-May	0.90	0.68	76%
16-May	1.70	1.55	91%
23-May	2.50	0.96	38%
30-May	2.20	1.70	77%
6-Jun	1.40	1.26	90%
13-Jun	1.20	1.02	85%
20-Jun	2.50	2.25	90%
27-Jun	2.90	2.50	86%
4-Jul	2.20	2.35	107%
11-Jul	2.20	1.98	90%

Average Efficiency	84%

Field ID: 16

Crop: Peas

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
25-Apr	0.40	0.36	90%
2-May	1.30	0.83	64%
9-May	0.50	0.28	56%
16-May	1.40	1.20	86%
23-May	1.80	1.46	81%
30-May	2.30	1.60	70%
6-Jun	2.00	1.66	83%
13-Jun	1.90	1.47	77%
20-Jun	2.20	1.60	73%

Average Efficiency	75%

Field ID: 17

Crop: Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
25-Jul	1.00	0.60	60%
1-Aug	2.30	1.27	55%
8-Aug	2.20	1.59	72%
15-Aug	2.80	2.30	82%
22-Aug	3.00	1.92	64%
29-Aug	2.50	1.83	73%
5-Sep	2.20	2.00	91%
12-Sep	2.50	2.25	90%
19-Sep	2.00	1.48	74%

Average Efficiency	74%

Field ID: 18

Crop: Ryegrass

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
14-Mar	0.40	0.29	73%
21-Mar	0.00	0.00	
28-Mar	1.00	0.41	41%
4-Apr	1.10	0.75	68%
11-Apr	0.70	0.44	63%
18-Apr	0.90	0.88	98%
25-Apr	0.50	0.36	72%
2-May	2.10	1.13	54%
9-May	0.90	0.68	76%
16-May	2.30	1.80	78%
23-May	1.60	1.31	82%
30-May	2.40	1.85	77%
6-Jun	1.90	1.71	90%
13-Jun	1.60	1.02	64%
20-Jun	2.10	1.60	76%
27-Jun	2.30	1.90	83%
4-Jul	2.20	1.80	82%
11-Jul	2.30	1.63	71%

Average Efficiency	73%

Field ID: 19

Crop: Winter Wheat

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
21-Mar	0.60	0.40	67%
28-Mar	0.70	0.26	37%
4-Apr	1.00	0.90	90%
11-Apr	1.20	0.89	74%
18-Apr	0.80	0.78	98%
25-Apr	2.10	1.61	77%
2-May	2.10	1.48	70%
9-May	1.80	1.63	91%
16-May	2.10	1.70	81%
23-May	2.10	1.66	79%
30-May	2.00	1.65	83%
6-Jun	1.70	1.71	101%
13-Jun	2.30	1.87	81%
20-Jun	2.10	1.50	71%
27-Jun	1.50	1.30	87%
4-Jul	0.90	0.75	83%

Average Efficiency	79%

Field ID: 20

Crop: Carrot

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
27-Jun	1.40	1.20	86%
4-Jul	2.00	1.45	73%
11-Jul	2.40	2.23	93%
18-Jul	2.80	2.27	81%
25-Jul	2.10	1.65	79%
1-Aug	2.40	2.02	84%
8-Aug	2.20	2.04	93%
15-Aug	2.50	2.45	98%
22-Aug	1.40	1.12	80%
29-Aug	1.40	1.73	124%
5-Sep	1.30	1.60	123%
12-Sep	1.30	1.30	100%
19-Sep	1.40	1.13	81%
26-Sep	1.30	1.22	94%

Average Efficiency	92%

Field ID: 21

Crop: Alfalfa

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
14-Mar	0.60	0.49	82%
21-Mar	0.80	0.80	100%
28-Mar	0.30	0.26	87%
4-Apr	1.40	1.00	71%
11-Apr	1.30	1.04	80%
18-Apr	0.70	0.48	69%
25-Apr	2.10	1.36	65%
2-May	1.00	0.48	48%
9-May	0.00	0.00	
16-May	1.70	1.10	65%
23-May	2.50	1.91	76%
30-May	2.40	1.90	79%
6-Jun	2.60	2.21	85%
13-Jun	0.30	0.42	140%
20-Jun	0.70	0.80	114%
27-Jun	2.80	2.15	77%
4-Jul	2.40	1.50	63%
11-Jul	2.40	1.73	72%
18-Jul	2.80	2.32	83%
25-Jul	2.10	1.70	81%
1-Aug	0.00	0.00	
8-Aug	0.80	0.84	105%
15-Aug	2.80	2.40	86%
22-Aug	2.80	2.57	92%
29-Aug	2.10	1.53	73%
5-Sep	2.20	2.25	102%
12-Sep	0.10	0.10	100%
19-Sep	0.00	0.00	
26-Sep	1.90	1.27	67%
3-Oct	2.10	1.51	72%
10-Oct	0.70	0.33	47%
17-Oct	0.00	0.00	

Average Efficiency	81%

Field ID: 22

Crop: Field Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
18-Jun	0.80	0.40	50%
25-Jun	1.50	1.60	107%
2-Jul	1.10	1.08	98%
9-Jul	1.10	0.80	73%
16-Jul	1.10	1.04	95%
23-Jul	1.70	1.21	71%
30-Jul	1.40	0.99	71%
6-Aug	1.80	1.39	77%
13-Aug	1.10	1.72	156%
20-Aug	1.00	0.98	98%

Average Efficiency	90%

Field ID: 23

Crop: Canola

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
26-Mar	1.30	0.48	37%
2-Apr	1.10	1.00	91%
9-Apr	1.40	1.21	86%
16-Apr	1.40	0.70	50%
23-Apr	0.40	0.32	80%
30-Apr	0.80	0.76	95%
7-May	1.40	0.98	70%
14-May	0.00	0.00	
21-May	0.20	0.12	60%
28-May	0.10	0.10	100%

Average Efficiency	74%

Field ID: 24

Crop: Peas

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
16-Apr	0.50	0.39	78%
23-Apr	0.20	0.12	60%
30-Apr	0.90	0.38	42%
7-May	1.00	1.06	106%
14-May	1.60	1.40	88%
21-May	1.80	1.46	81%
28-May	1.90	1.35	71%
4-Jun	2.30	1.89	82%
11-Jun	1.20	1.09	91%
18-Jun	0.70	0.60	86%

Average Efficiency	78%

Field ID: 25

Crop: Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
16-Jul	1.70	0.70	41%
23-Jul	1.70	1.12	66%
30-Jul	1.80	1.77	98%
6-Aug	2.50	2.00	80%
13-Aug	2.60	1.74	67%
20-Aug	2.30	2.18	95%
27-Aug	1.30	1.42	109%
3-Sep	2.00	1.45	73%
10-Sep	1.30	1.20	92%
17-Sep	1.30	0.83	64%
24-Sep	1.30	1.22	94%
1-Oct	1.30	0.87	67%
8-Oct	0.50	0.51	102%

Average Efficiency	81%

Field ID: 26

Crop: Ryegrass

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
21-Mar	0.70	0.50	71%
28-Mar	1.00	0.46	46%
4-Apr	0.60	0.45	75%
11-Apr	1.00	0.69	69%
18-Apr	0.60	0.43	72%
25-Apr	0.90	0.71	79%
2-May	1.30	1.13	87%
9-May	1.00	0.93	93%
16-May	2.10	1.80	86%
23-May	2.40	2.06	86%
30-May	2.30	2.30	100%
6-Jun	2.40	2.26	94%
13-Jun	2.10	1.82	87%
20-Jun	2.30	2.35	102%
27-Jun	2.50	2.40	96%
4-Jul	2.60	1.80	69%
11-Jul	1.80	0.94	52%

Average Efficiency	80%

Field ID: 27

Crop: Onion

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
25-Apr	0.50	0.18	36%
2-May	0.70	0.43	61%
9-May	0.90	0.68	76%
16-May	1.00	0.70	70%
23-May	1.00	0.81	81%
30-May	1.20	0.80	67%
6-Jun	1.60	1.61	101%
13-Jun	0.60	0.42	70%
20-Jun	2.70	2.15	80%
27-Jun	2.50	2.10	84%
4-Jul	2.60	2.10	81%
11-Jul	2.20	2.08	95%
18-Jul	2.50	2.22	89%
25-Jul	2.30	2.35	102%
1-Aug	2.30	1.67	73%
8-Aug	2.50	2.24	90%
15-Aug	1.50	1.15	77%
22-Aug	0.80	0.87	109%

Average Efficiency	80%

Field ID: 28

Crop: Dehy Onion

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
25-Apr	0.90	0.78	87%
2-May	0.70	0.48	69%
9-May	0.50	0.33	66%
16-May	0.60	0.45	75%
23-May	1.10	0.71	65%
30-May	2.00	2.00	100%
6-Jun	1.70	1.36	80%
13-Jun	2.00	1.62	81%
20-Jun	2.60	2.35	90%
27-Jun	2.70	2.40	89%
4-Jul	2.40	2.80	117%
11-Jul	2.60	2.63	101%
18-Jul	2.60	2.67	103%
25-Jul	2.50	2.25	90%
1-Aug	2.10	2.27	108%
8-Aug	1.10	1.19	108%

Average Efficiency	89%

Field ID: 29

Crop: Onion

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
25-Apr	0.40	0.28	70%
2-May	0.70	0.08	11%
9-May	0.60	0.43	72%
16-May	1.10	1.00	91%
23-May	1.20	0.96	80%
30-May	1.90	1.25	66%
6-Jun	2.00	1.41	71%
13-Jun	1.70	1.42	84%
20-Jun	2.40	1.95	81%
27-Jun	2.70	1.90	70%
4-Jul	2.20	2.20	100%
11-Jul	2.00	1.58	79%
18-Jul	2.40	1.37	57%
25-Jul	1.70	1.60	94%
1-Aug	2.20	1.57	71%
8-Aug	1.50	1.69	113%
15-Aug	0.40	0.20	50%
22-Aug	0.40	0.47	118%
29-Aug	0.40	0.28	70%

Average Efficiency	76%

Field ID: 30

Crop: Onion

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
7-Jan	0.70	0.28	40%
14-Jan	0.60	0.48	80%
21-Jan	1.00	0.70	70%
28-Jan	1.50	1.01	67%
4-Feb	1.50	1.40	93%
11-Feb	1.80	1.31	73%
18-Feb	1.50	0.92	61%
25-Feb	2.40	2.00	83%
3-Mar	2.60	2.35	90%
10-Mar	2.60	2.40	92%
17-Mar	2.00	1.18	59%
24-Mar	2.40	2.67	111%
31-Mar	1.90	1.85	97%
7-Apr	2.40	1.72	72%
14-Apr	2.00	1.89	95%
21-Apr	1.00	1.20	120%
28-Apr	0.50	0.42	84%

Average Efficiency	82%

Field ID: 31

Crop: Onion

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
25-Apr	0.50	0.48	96%
2-May	0.80	0.58	73%
9-May	0.80	0.63	79%
16-May	0.80	0.75	94%
23-May	1.60	1.46	91%
30-May	1.70	1.30	76%
6-Jun	2.00	1.61	81%
13-Jun	1.90	1.72	91%
20-Jun	2.40	2.25	94%
27-Jun	2.50	1.75	70%
4-Jul	2.30	2.35	102%
11-Jul	2.40	2.18	91%
18-Jul	2.60	1.82	70%
25-Jul	2.00	1.80	90%
1-Aug	2.10	1.72	82%
8-Aug	1.90	1.59	84%
15-Aug	0.70	0.55	79%
22-Aug	0.60	0.42	70%

Average Efficiency	84%

Field ID: 32

Crop: Field Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
15-May	0.70	0.5	71%
22-May	0.80	0.71	89%
29-May	0.90	0.70	78%
5-Jun	1.30	0.91	70%
12-Jun	1.10	0.92	84%
19-Jun	1.70	1.80	106%
26-Jun	1.70	1.70	100%
3-Jul	2.30	2.45	107%
10-Jul	2.10	1.78	85%
17-Jul	2.30	2.50	109%
24-Jul	2.10	2.07	99%
31-Jul	2.10	1.97	94%
7-Aug	2.50	2.19	88%
14-Aug	1.90	2.25	118%
21-Aug	2.10	2.13	101%
28-Aug	1.40	1.27	91%
4-Sep	1.30	1.30	100%
11-Sep	0.70	0.25	36%

Average Efficiency	90%

Field ID: 33

Crop: Field Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
15-Mar	1.00	0.5	50%
22-Mar	0.80	0.81	101%
29-Mar	0.80	1.00	125%
5-Apr	1.20	1.16	97%
12-Apr	1.10	0.92	84%
19-Apr	1.90	1.70	89%
26-Apr	1.80	1.80	100%
3-May	2.10	1.90	90%
10-May	2.00	1.23	62%
17-May	2.30	2.35	102%
24-May	2.10	1.47	70%
31-May	2.30	2.22	97%
7-Jun	2.30	1.64	71%
14-Jun	1.90	2.00	105%
21-Jun	2.10	1.53	73%
28-Jun	1.60	1.27	79%
5-Jul	1.40	1.15	82%
12-Jul	0.70	0.25	36%

Average Efficiency	86%

Field ID: 34

Crop: Potato

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
5-Jun	2.30	2.02	88%
12-Jun	1.40	1.12	80%
19-Jun	1.70	1.70	100%
26-Jun	1.80	1.73	96%
3-Jul	1.70	1.53	90%
10-Jul	2.10	2.05	98%
17-Jul	2.00	2.09	105%
24-Jul	1.60	1.43	89%
31-Jul	1.40	1.29	92%
7-Aug	1.70	1.58	93%
14-Aug	1.40	1.50	107%
21-Aug	1.30	1.02	78%
28-Aug	0.80	0.92	115%
4-Sep	0.90	0.49	54%
11-Sep	0.60	0.70	117%

Average Efficiency	93%

Field ID: 35

Crop: Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
12-Jun	1.00	0.82	82%
19-Jun	1.70	1.70	100%
26-Jun	1.70	1.40	82%
3-Jul	2.30	2.00	87%
10-Jul	2.20	1.78	81%
17-Jul	2.40	2.10	88%
24-Jul	2.10	1.52	72%
31-Jul	2.30	1.62	70%
7-Aug	2.60	1.59	61%
14-Aug	1.90	1.70	89%
21-Aug	2.10	1.68	80%
28-Aug	1.40	1.07	76%
4-Sep	1.40	0.80	57%
11-Sep	0.60	0.25	42%

Average Efficiency	76%

Field ID: 36

Crop: Winter Wheat

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
3-Apr	0.60	0.25	42%
10-Apr	0.60	0.29	48%
17-Apr	1.10	0.64	58%
24-Apr	0.90	0.87	97%
1-May	1.10	1.31	119%
8-May	1.00	0.83	83%
15-May	1.60	1.55	97%
22-May	1.70	1.36	80%
29-May	1.70	1.60	94%
5-Jun	2.10	1.61	77%
12-Jun	1.00	0.97	97%
19-Jun	1.10	1.00	91%
26-Jun	1.60	1.25	78%
3-Jul	1.60	1.25	78%
10-Jul	1.10	0.53	48%

Average Efficiency	82%

Field ID: 37

Crop: Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
19-Jun	1.10	0.55	50%
26-Jun	1.10	0.73	66%
3-Jul	1.60	1.38	86%
10-Jul	2.20	2.05	93%
17-Jul	2.40	2.24	93%
24-Jul	2.10	1.93	92%
31-Jul	2.30	2.14	93%
7-Aug	2.40	1.73	72%
14-Aug	2.10	1.60	76%
21-Aug	2.10	1.62	77%
28-Aug	1.50	1.22	81%
4-Sep	1.50	1.24	83%

Average Efficiency	83%

Field ID: 38

Crop: Peas/Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
18-Apr	0.60	0.57	95%
25-Apr	0.60	0.36	60%
2-May	1.10	0.43	39%
9-May	1.30	0.78	60%
16-May	2.10	1.75	83%
23-May	2.70	1.86	69%
30-May	2.10	1.65	79%
6-Jun	2.00	1.26	63%
1-Aug	2.40	1.75	73%
8-Aug	2.50	2.09	84%
15-Aug	2.80	2.35	84%
22-Aug	2.40	2.27	95%
29-Aug	1.90	1.63	86%
5-Sep	2.20	1.65	75%
12-Sep	2.20	2.05	93%
Average Efficiency			**74%**

Field ID: 39

Crop: Peas/Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
11-Apr	0.70	0.34	49%
18-Apr	0.50	0.58	116%
25-Apr	0.70	0.51	73%
2-May	1.20	0.58	48%
9-May	1.10	1.03	94%
16-May	2.30	2.05	89%
23-May	2.30	2.06	90%
30-May	2.30	1.75	76%
1-Aug	2.60	1.93	74%
8-Aug	2.80	2.14	76%
15-Aug	2.80	2.50	89%
22-Aug	2.20	1.72	78%
29-Aug	2.10	1.58	75%
5-Sep	2.00	1.45	73%
12-Sep	2.00	1.60	80%
19-Sep	1.60	0.83	52%
Average Efficiency			**79%**

Field ID: 40

Crop: Peas/Sweet Corn

Week (Starting Date)	Gross Application (Inches)	Net Application (Inches)	Application Efficiency
18-Apr	0.25	0.22	88%
25-Apr	0.80	0.36	45%
2-May	1.20	0.93	78%
9-May	1.90	0.53	28%
16-May	2.10	1.70	81%
23-May	2.20	2.16	98%
30-May	2.20	2.00	91%
6-Jun	2.20	2.26	103%
13-Jun	2.10	1.72	82%
1-Aug	2.30	1.97	86%
8-Aug	2.60	1.99	77%
15-Aug	2.80	2.00	71%
22-Aug	2.40	2.12	88%
29-Aug	2.10	2.03	97%
5-Sep	1.90	1.40	74%
12-Sep	2.00	1.75	88%
19-Sep	1.90	0.93	49%

Average Efficiency	77%

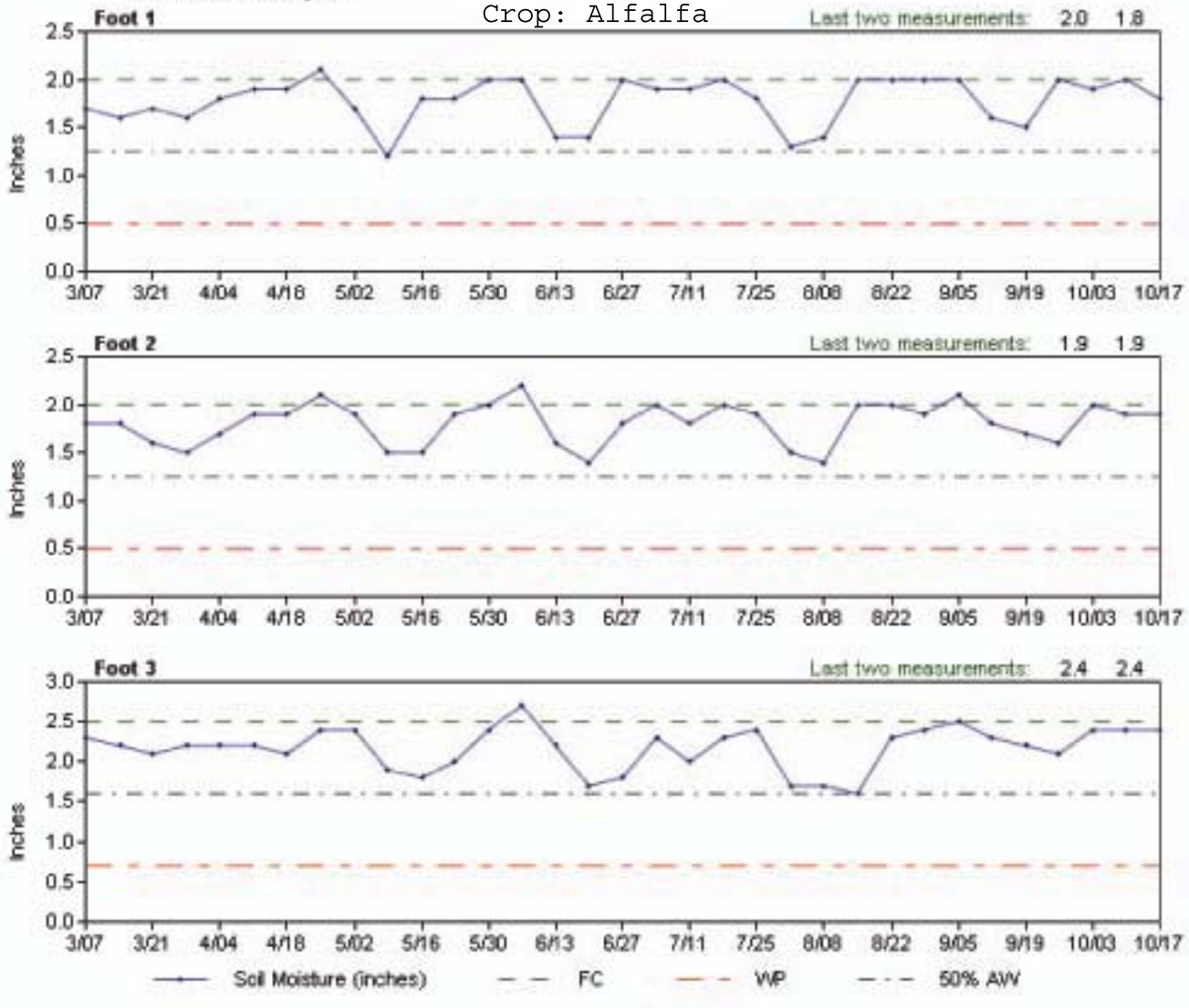
Graphical Data

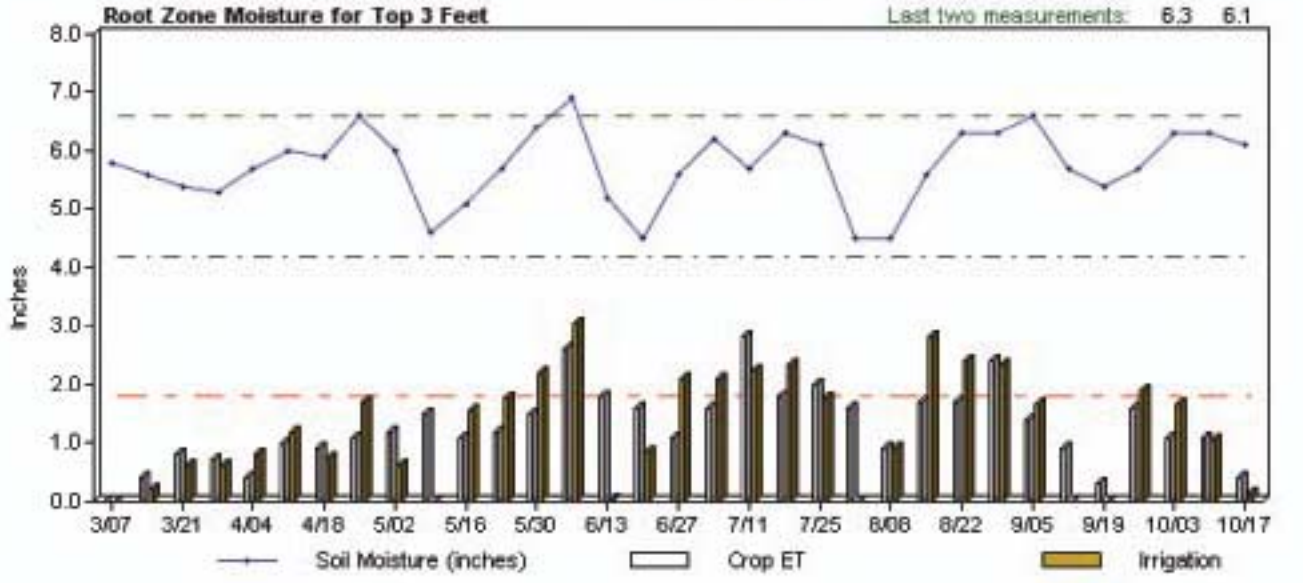
505 East Main Street | Hermiston, Oregon 97838 | 541.567.0252 *office* | 541.567.4239 *fax* | www.irz.com

IRZ Consulting, LLC

Soil Moisture Graphs

Field ID:1
Crop: Alfalfa



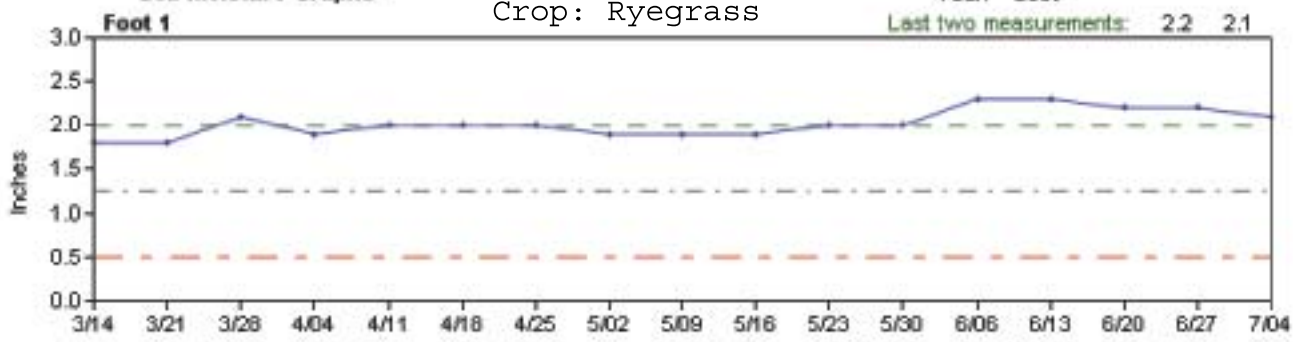


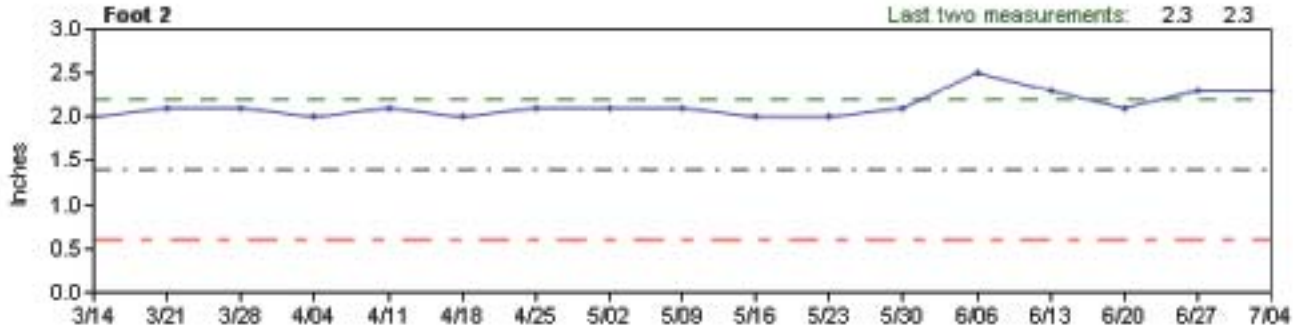
IRZ Consulting, LLC

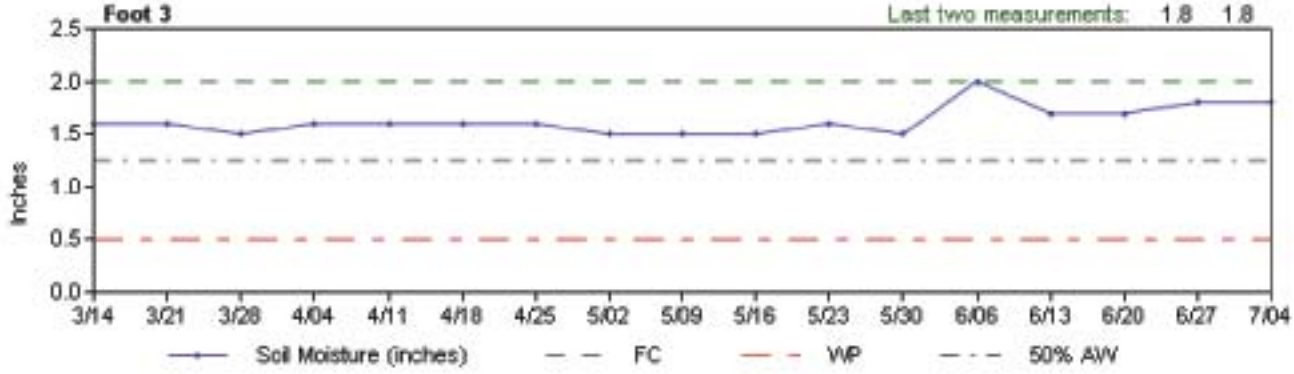
Field ID: 2
Crop: Ryegrass

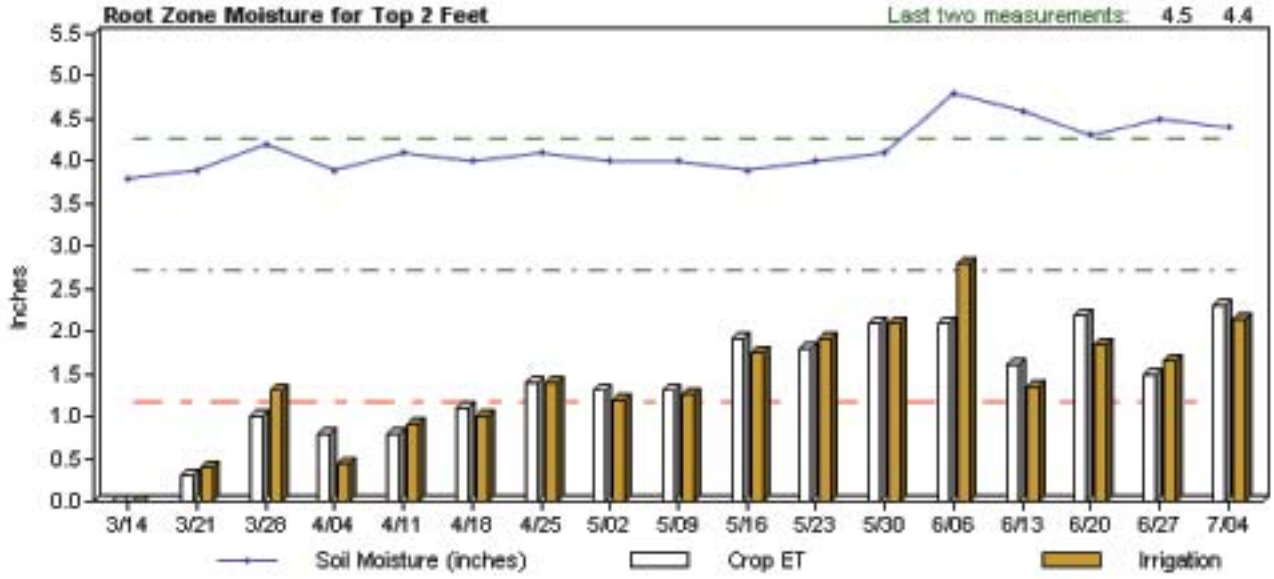
Soil Moisture Graphs

Year: 2007







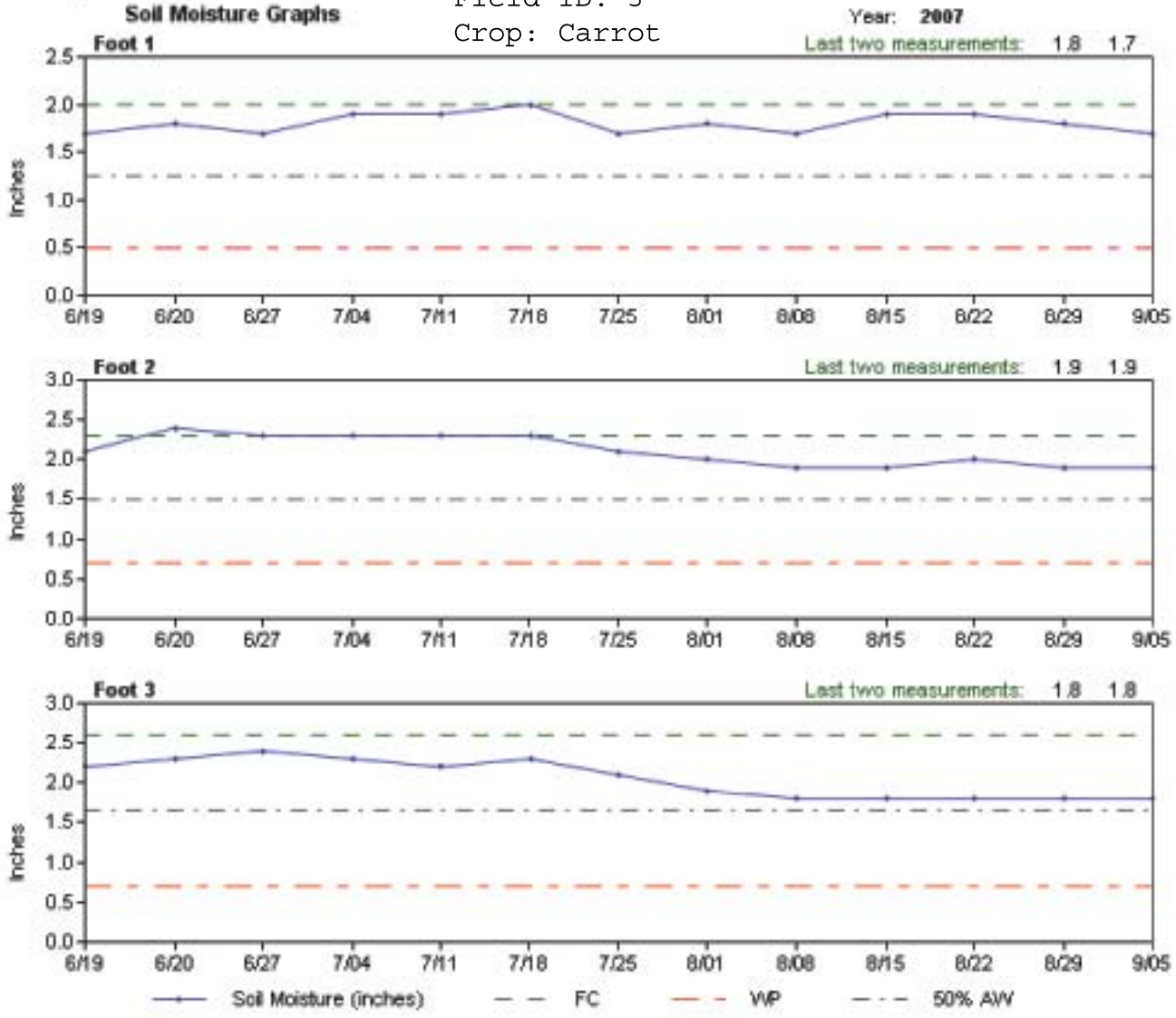


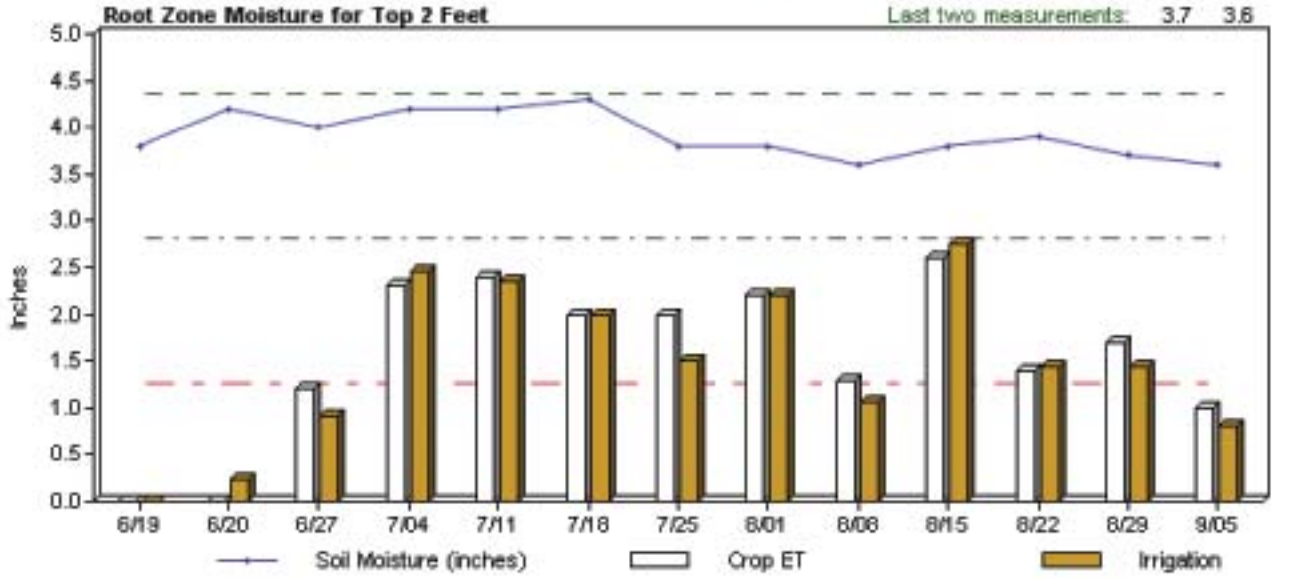
IRZ Consulting, LLC

Field ID: 3
Crop: Carrot

Soil Moisture Graphs

Year: 2007





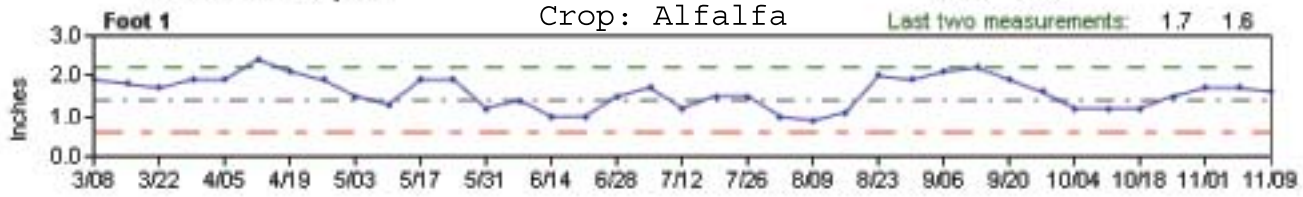
IRZ Consulting, LLC

Soil Moisture Graphs

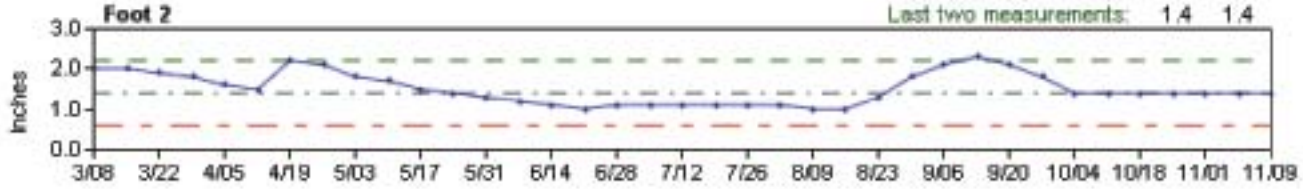
Field ID: 4
Crop: Alfalfa

Year: **2007**

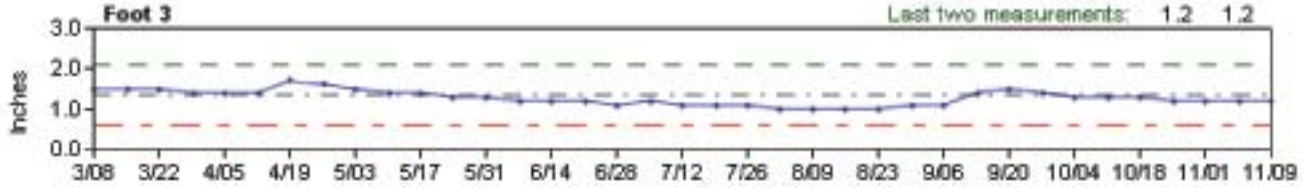
Foot 1 — Last two measurements: 1.7 1.8



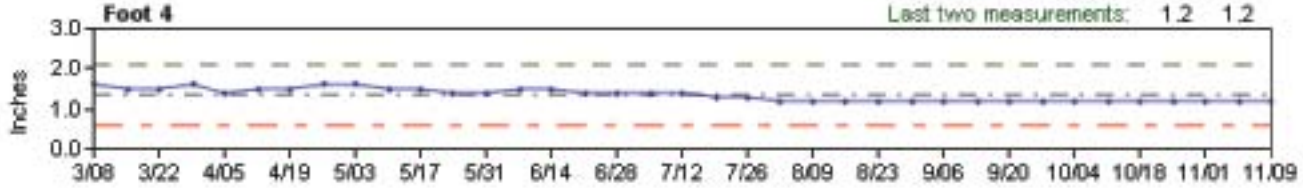
Foot 2 — Last two measurements: 1.4 1.4



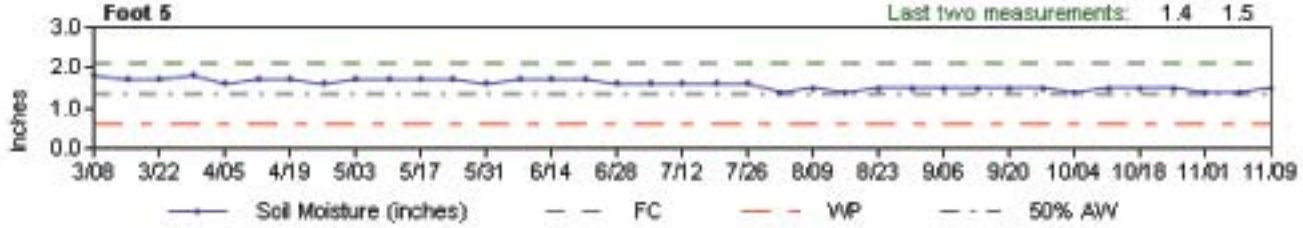
Foot 3 — Last two measurements: 1.2 1.2



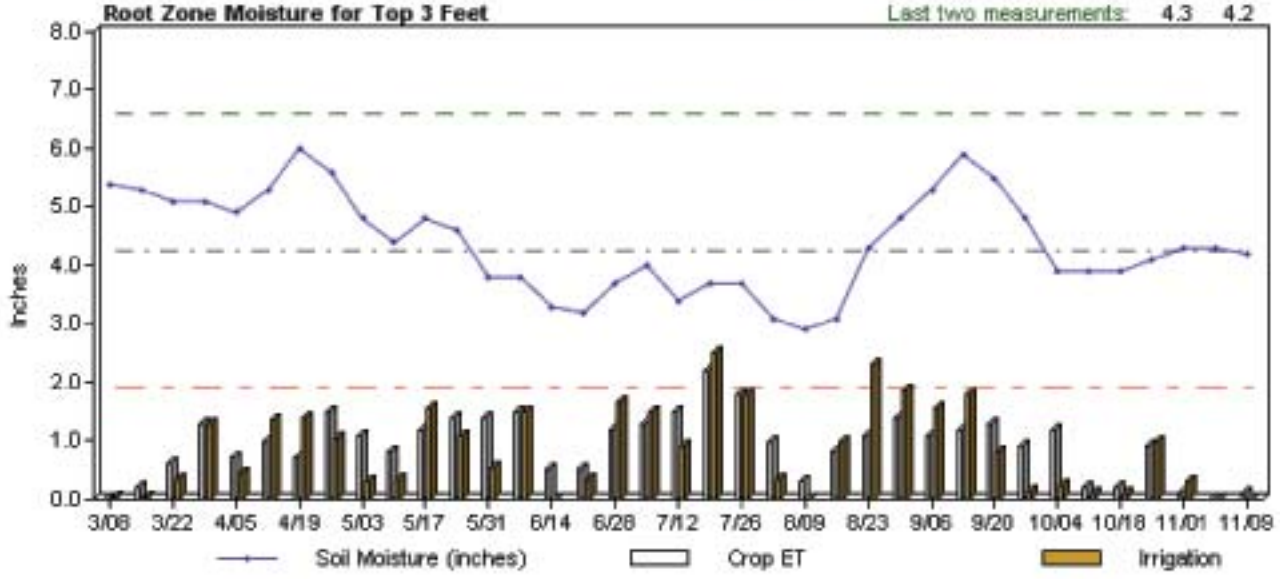
Foot 4 — Last two measurements: 1.2 1.2



Foot 5 — Last two measurements: 1.4 1.5



Root Zone Moisture for Top 3 Feet — Last two measurements: 4.3 4.2



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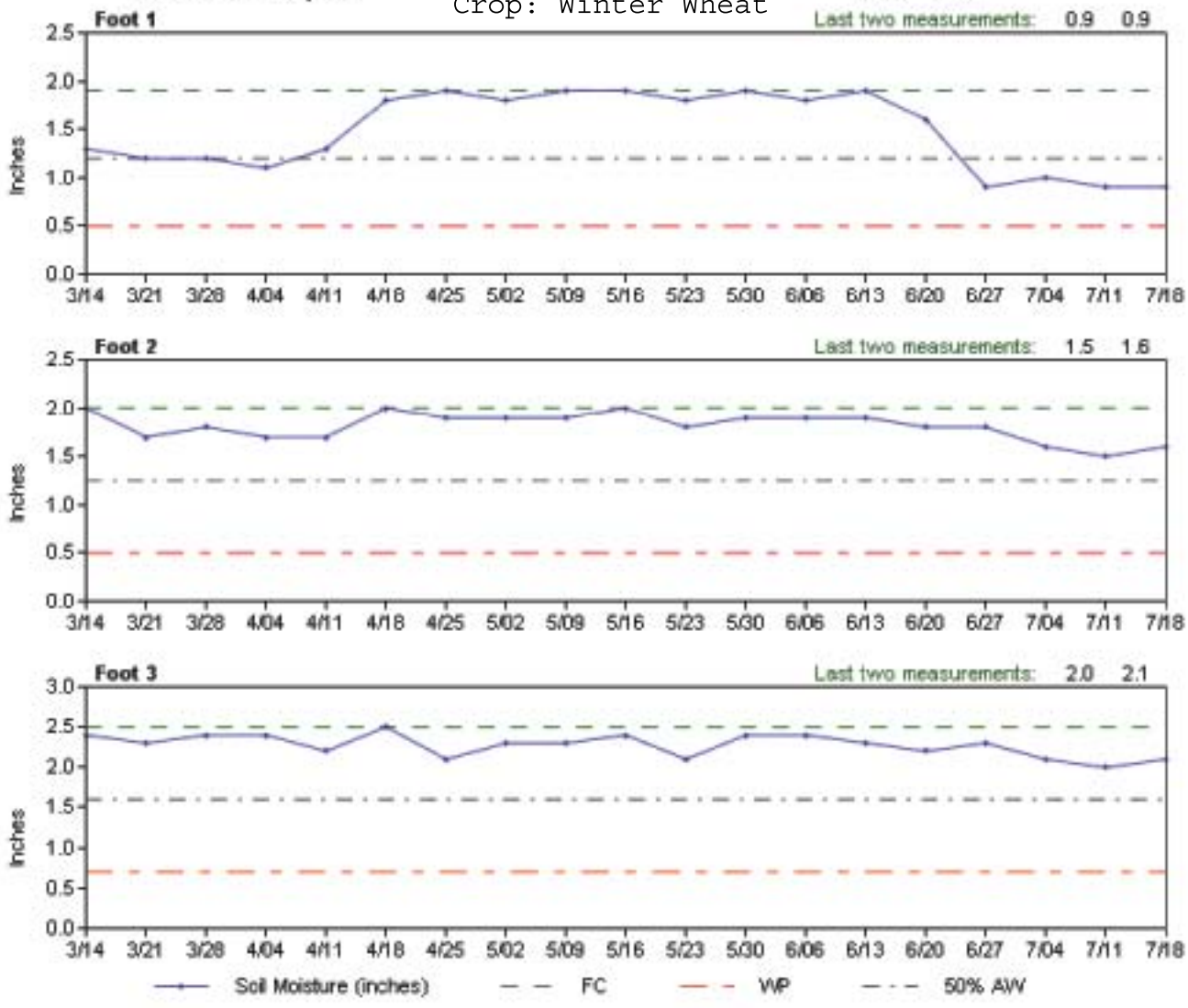
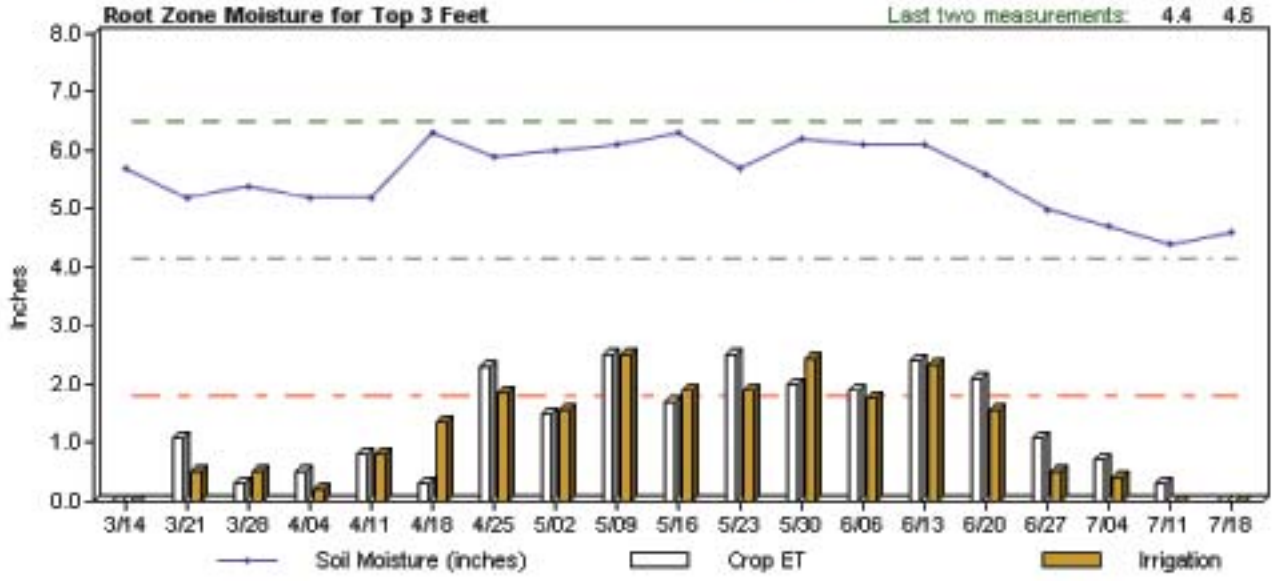
Field ID: 5
Crop: Winter Wheat

Soil Moisture Graphs

Year: 2007



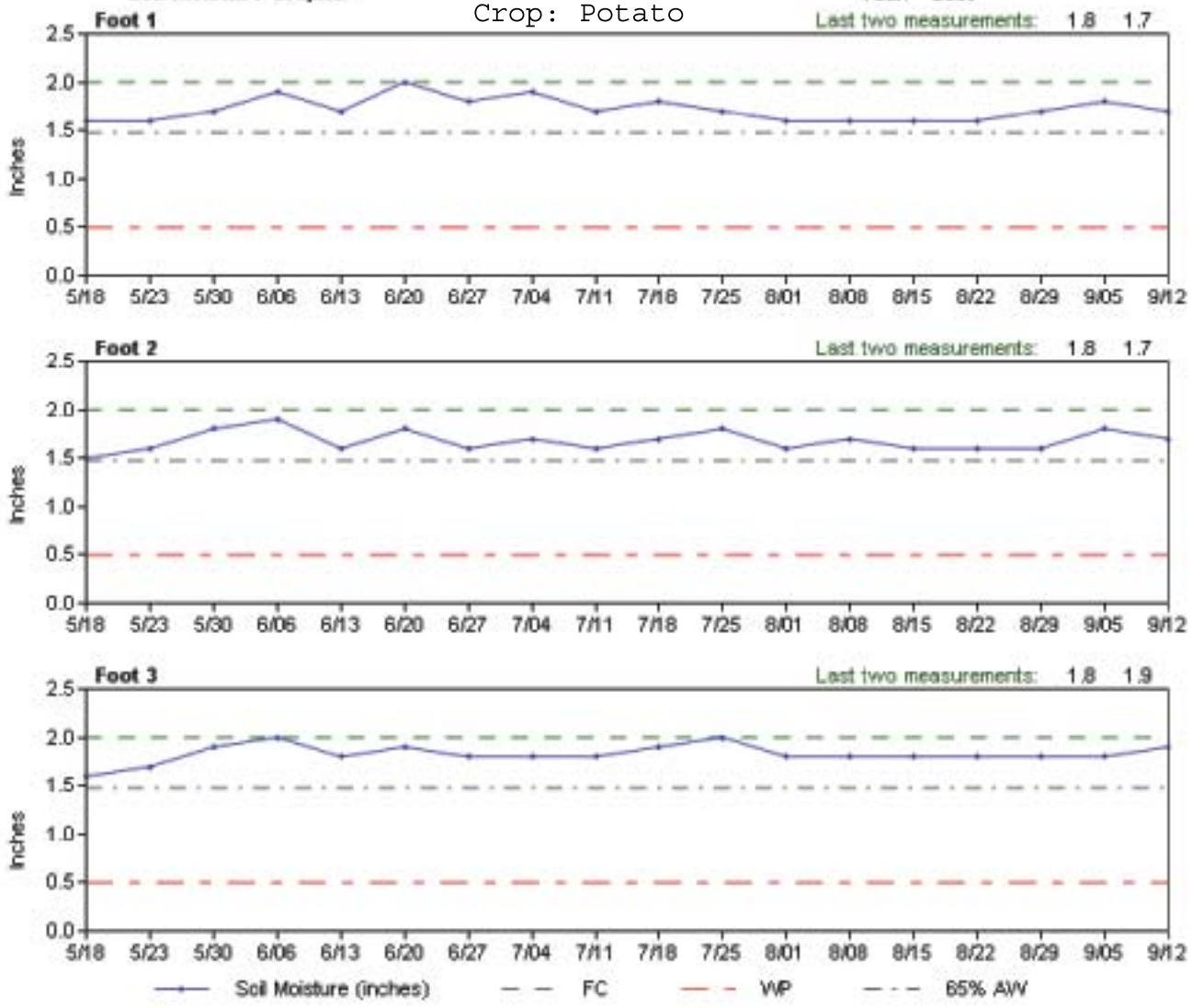


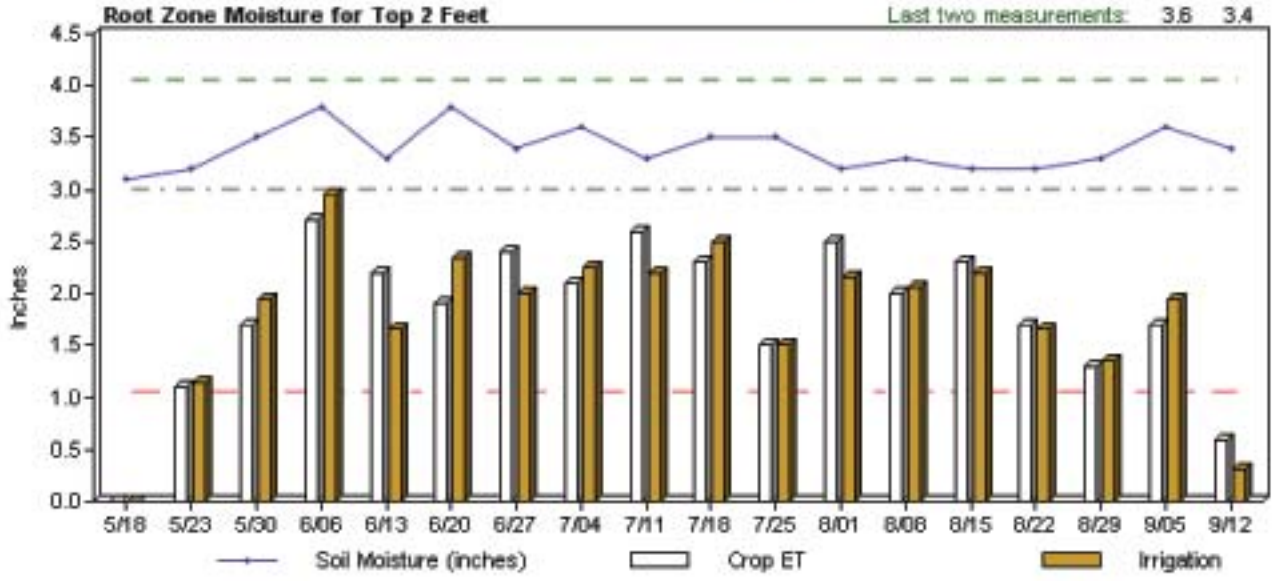
IRZ Consulting, LLC

Field ID: 6
Crop: Potato

Soil Moisture Graphs

Year: 2007

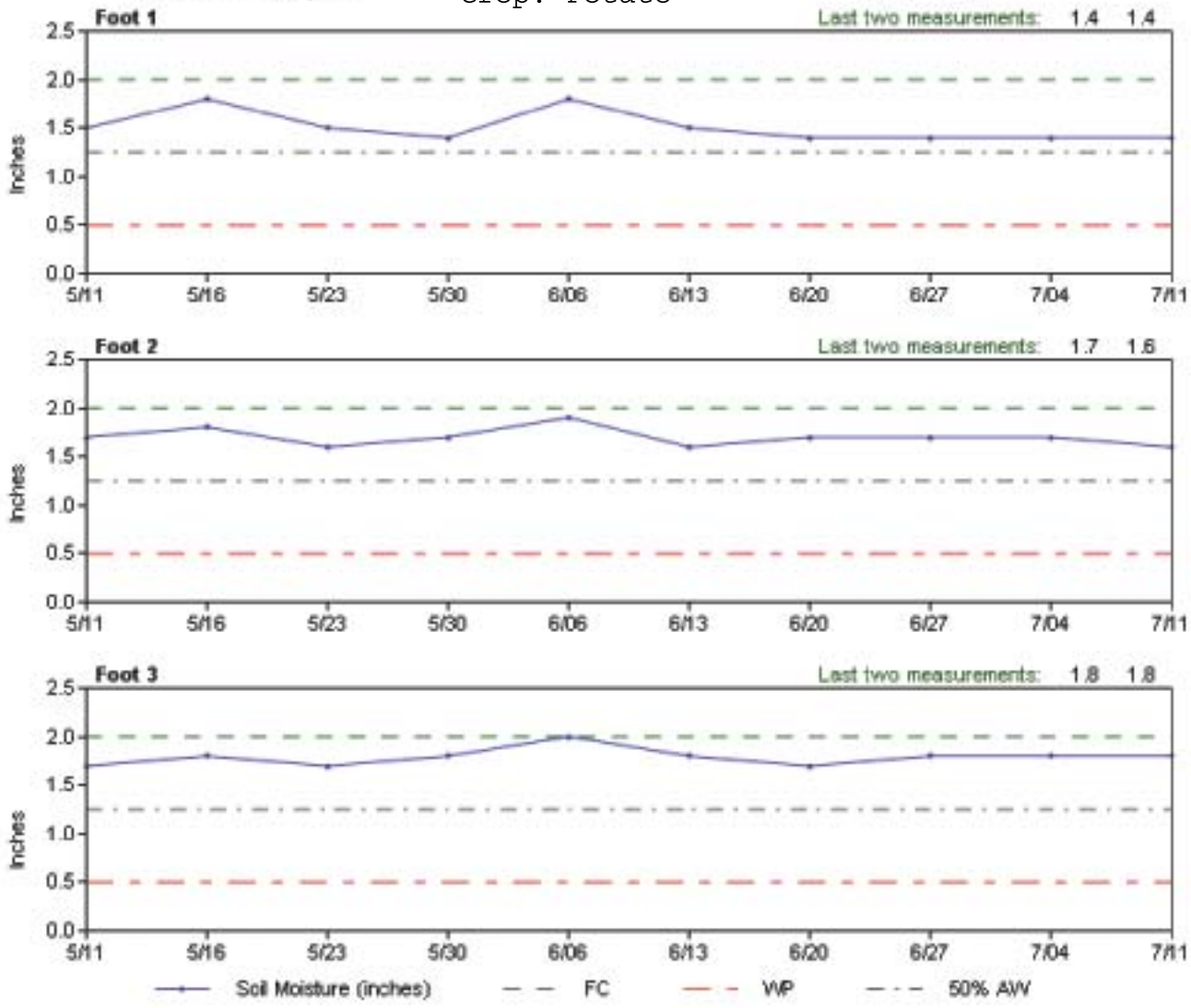


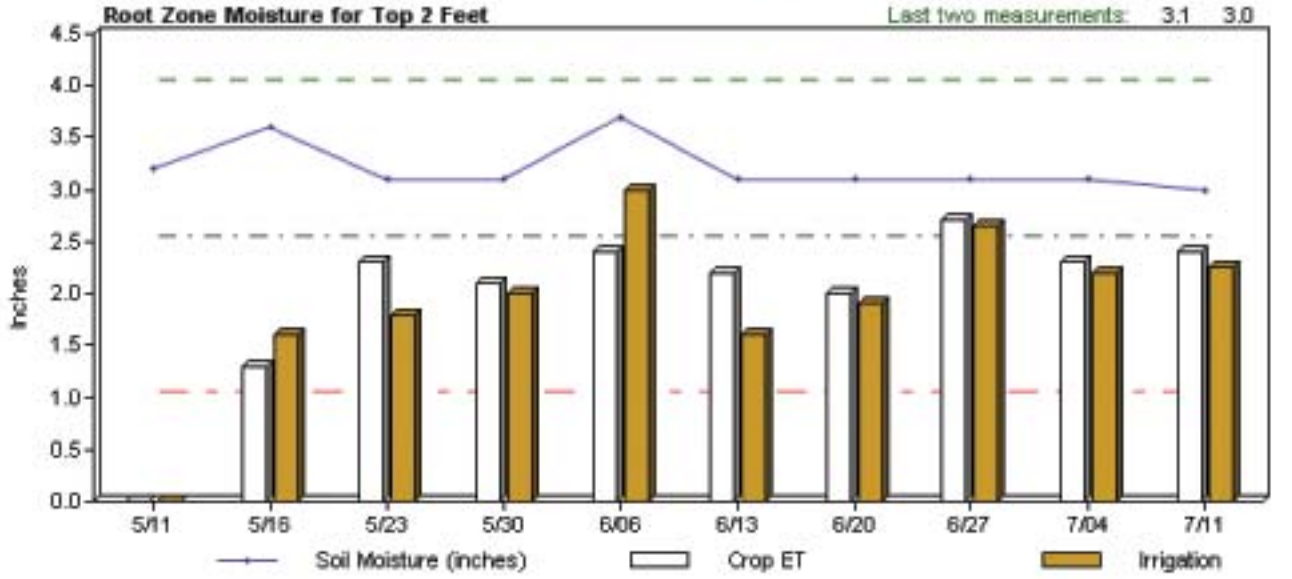


IRZ Consulting, LLC

Field ID: 7
Crop: Potato

Soil Moisture Graphs Year: **2007**



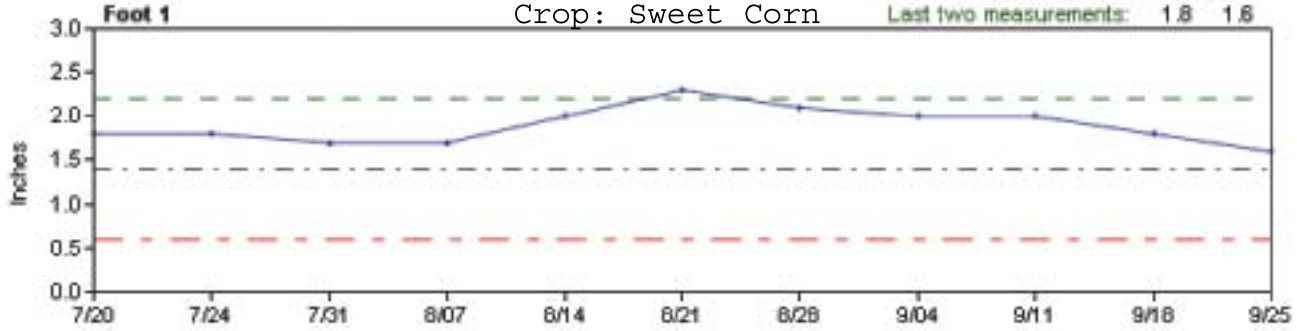


IRZ Consulting, LLC

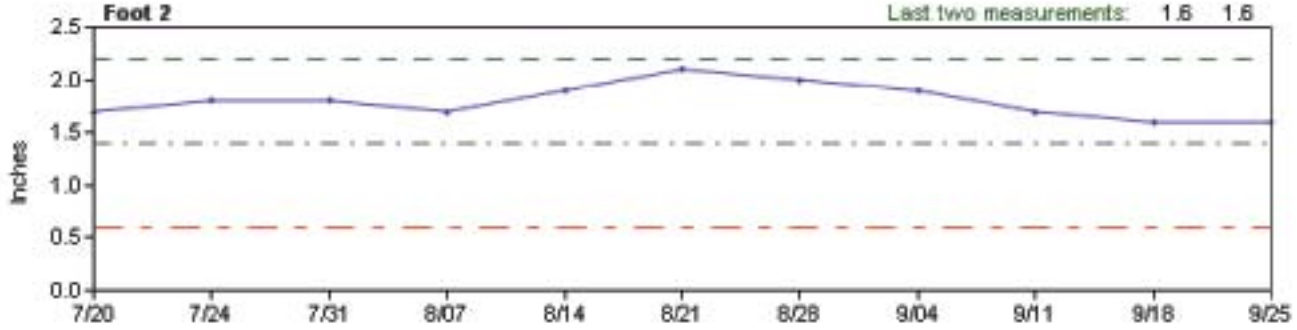
Soil Moisture Graphs Field ID: 8 Year: **2007**

Crop: Sweet Corn

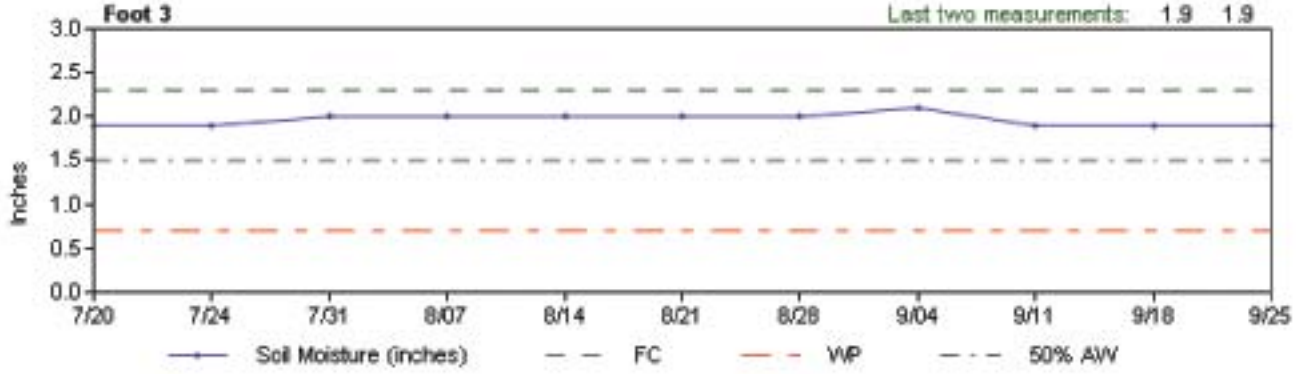
Foot 1 Last two measurements: 1.8 1.6



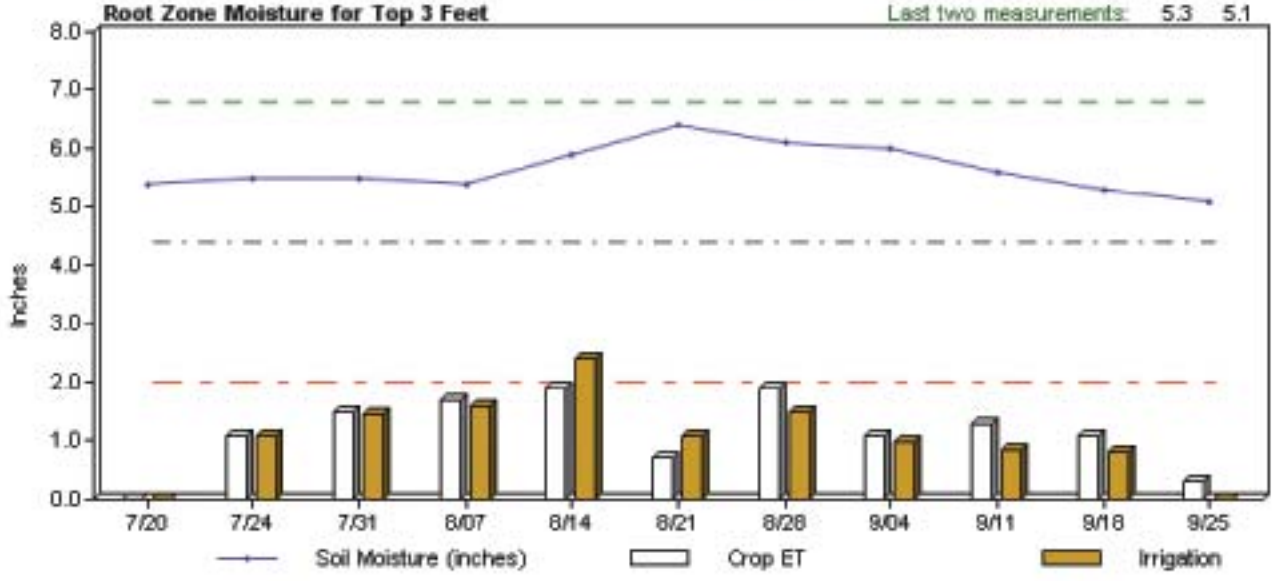
Foot 2 Last two measurements: 1.6 1.6



Foot 3 Last two measurements: 1.9 1.9



Root Zone Moisture for Top 3 Feet Last two measurements: 5.3 5.1

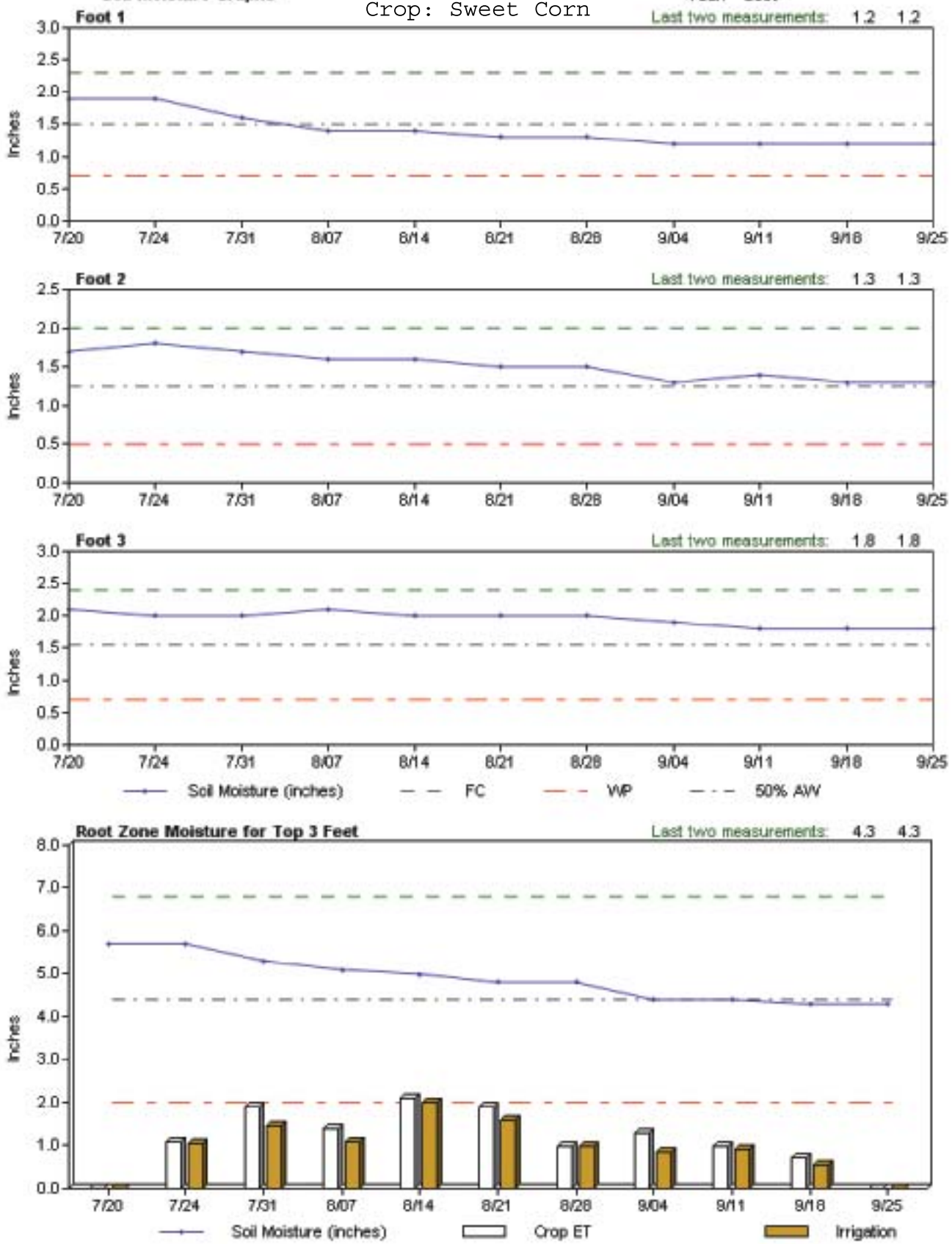


IRZ Consulting, LLC

Field ID: 9
Crop: Sweet Corn

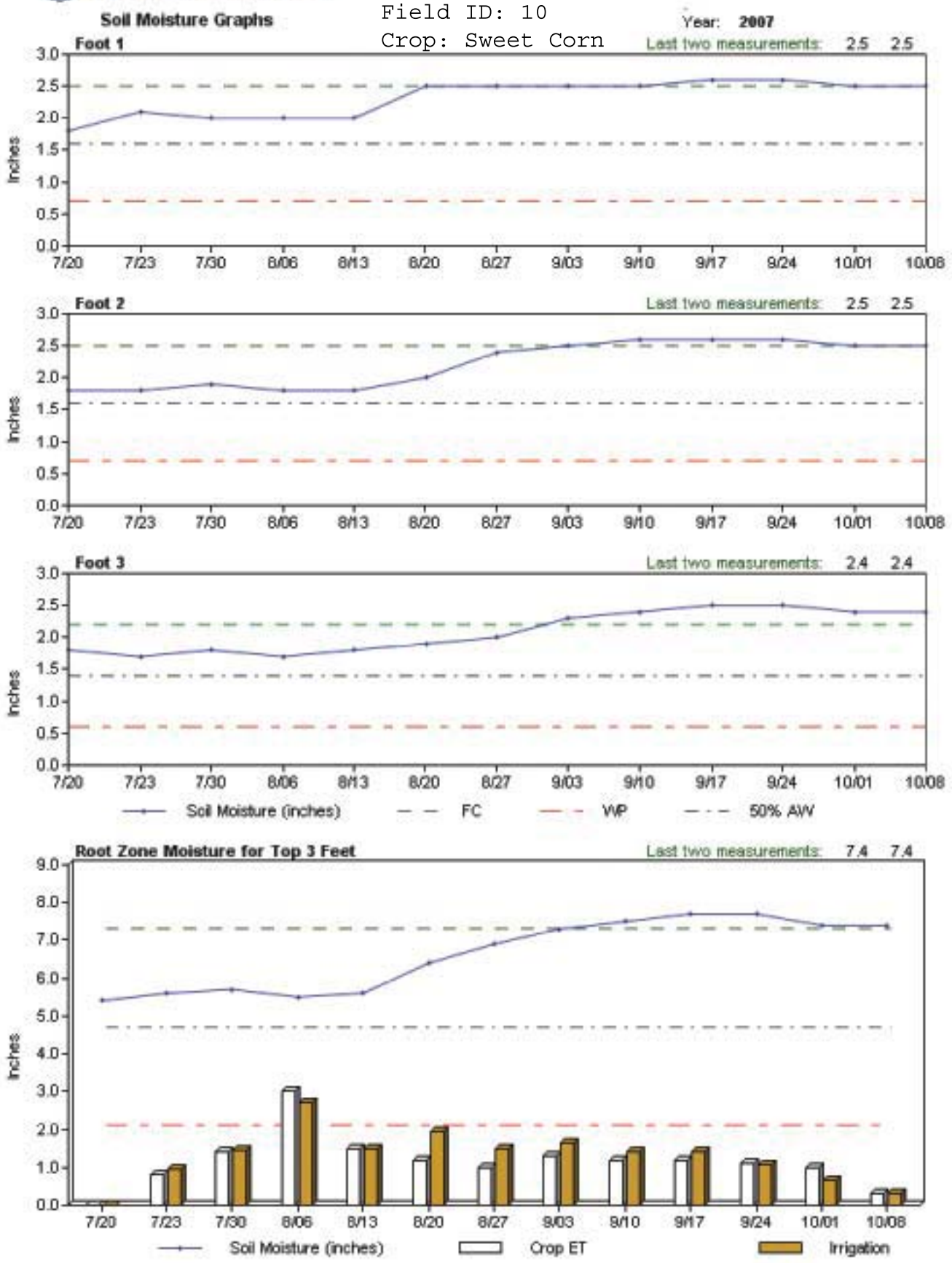
Soil Moisture Graphs

Year: 2007



IRZ Consulting, LLC

Field ID: 10
Crop: Sweet Corn

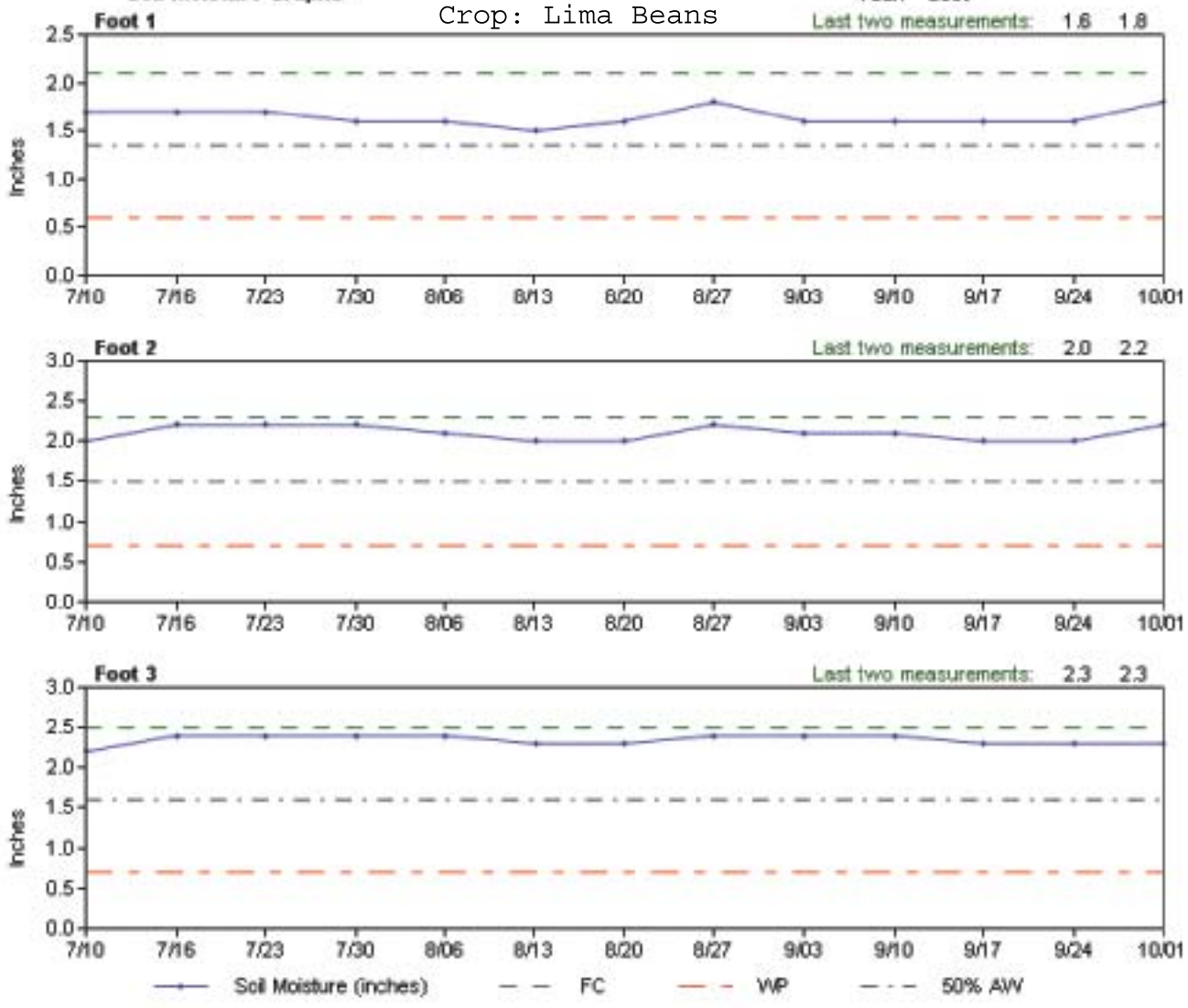


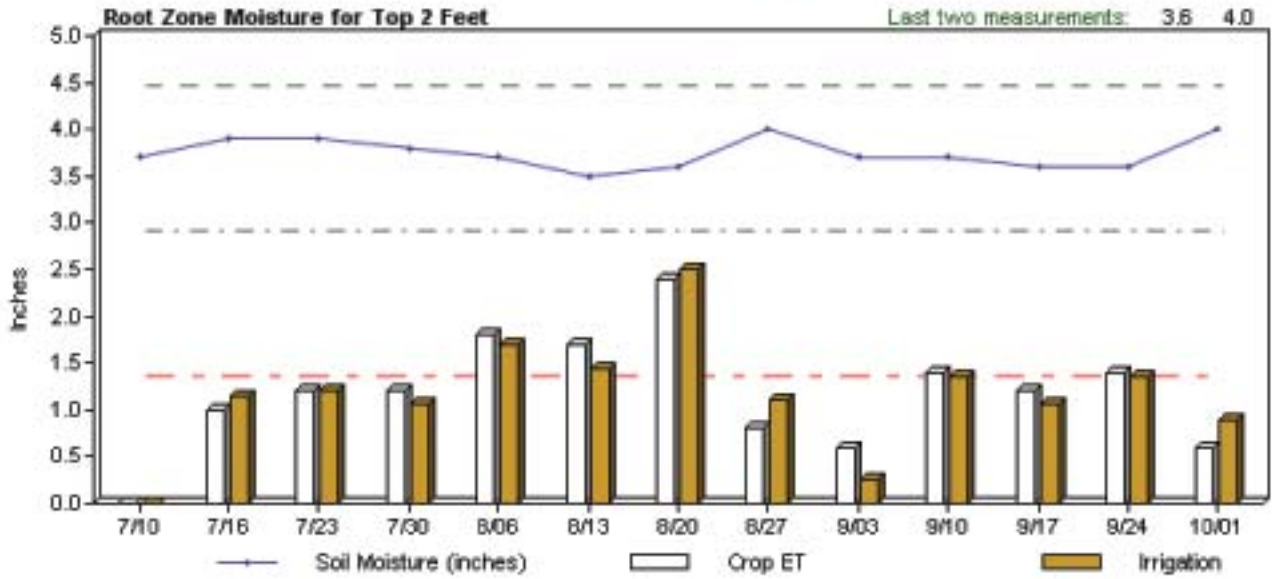
IRZ Consulting, LLC

Field ID: 11
Crop: Lima Beans

Soil Moisture Graphs

Year: 2007



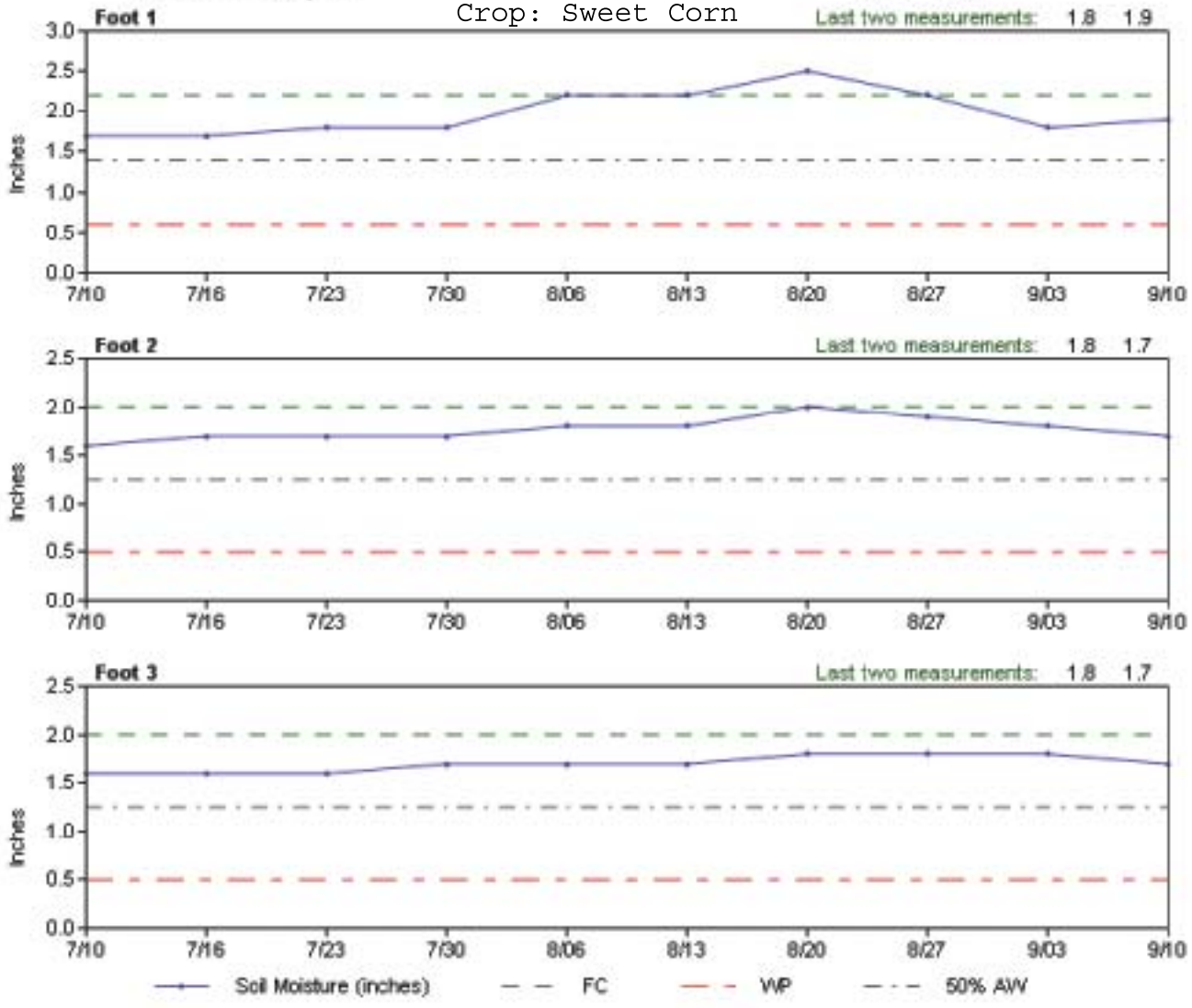


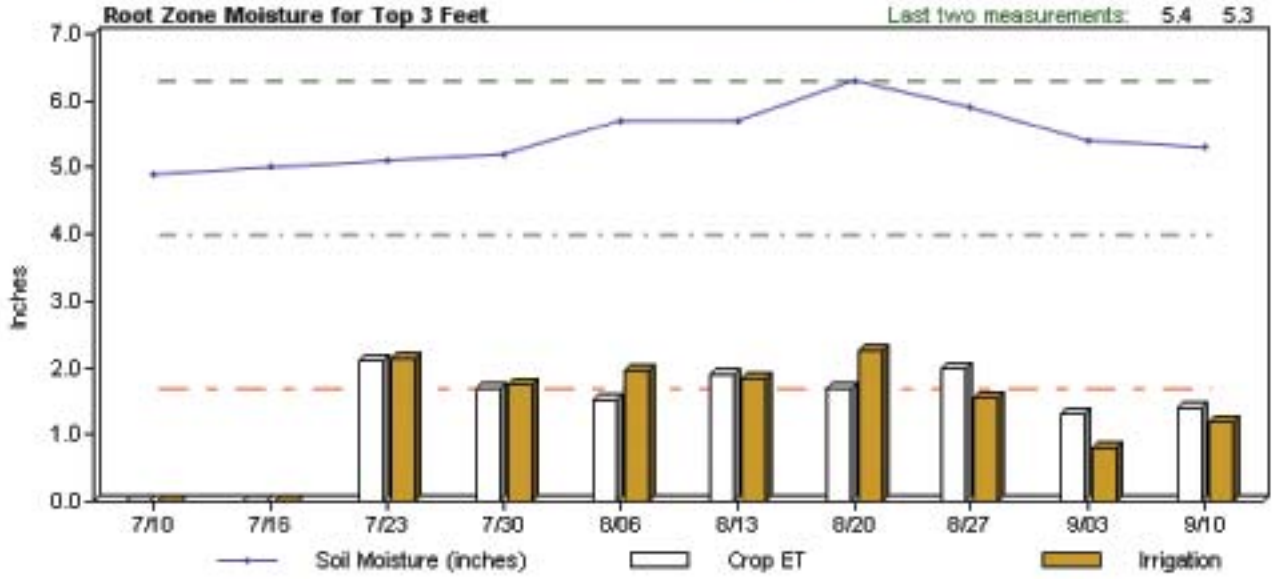
IRZ Consulting, LLC

Soil Moisture Graphs

Field ID:12
Crop: Sweet Corn

Year: 2007



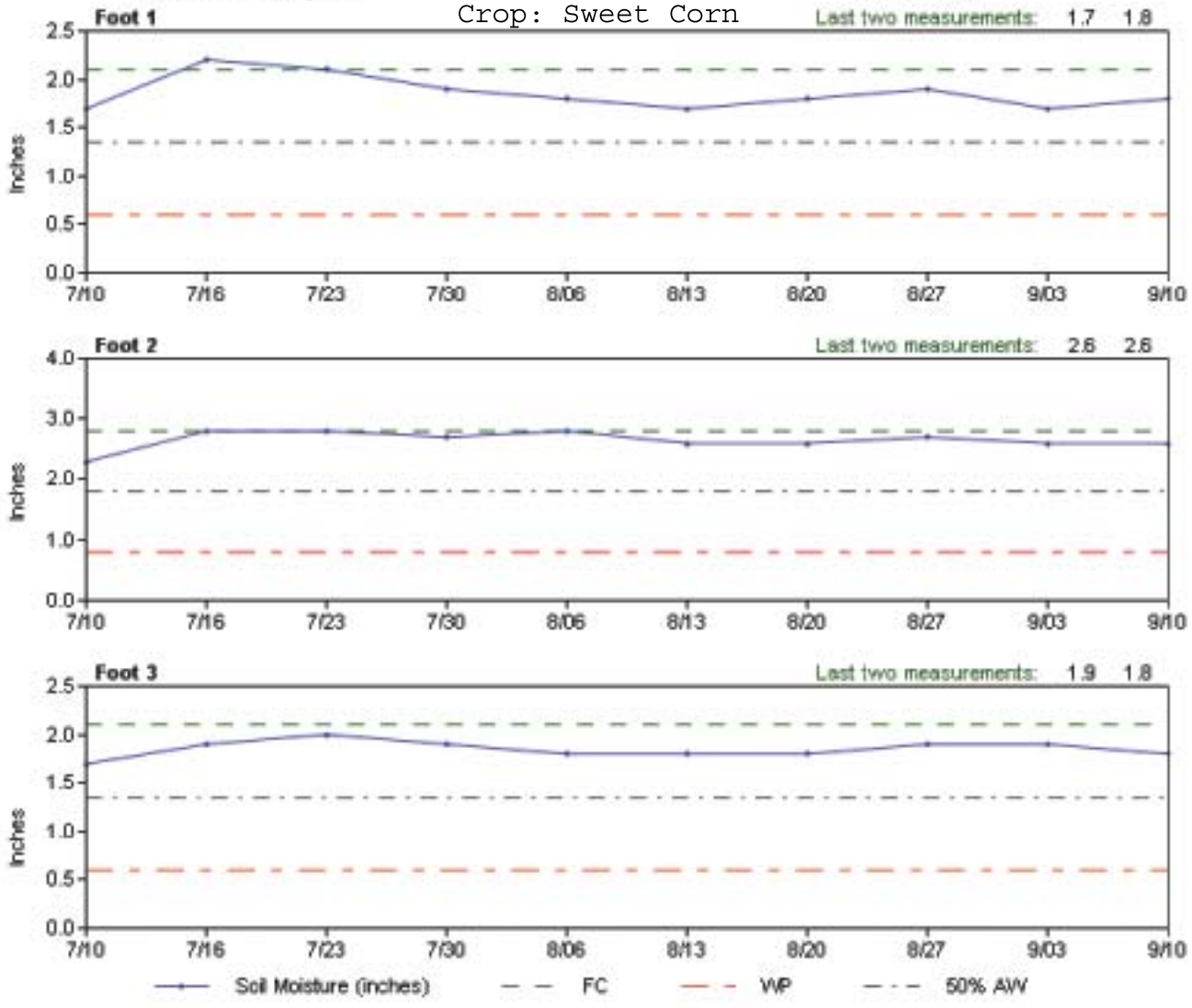


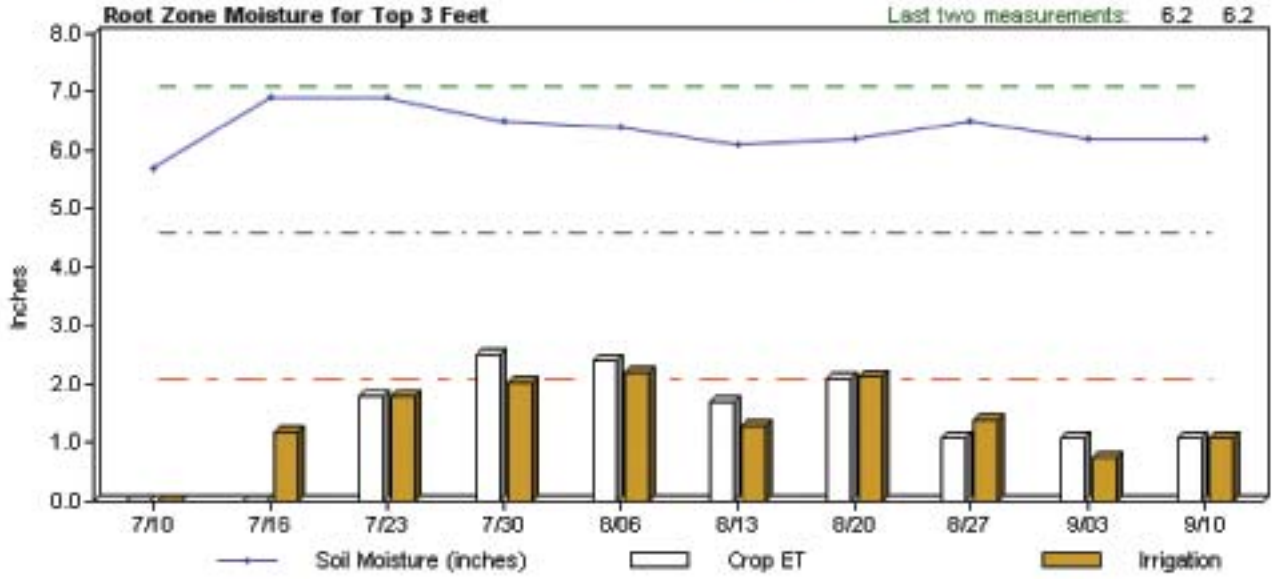
IRZ Consulting, LLC

Soil Moisture Graphs

Field ID: 13
Crop: Sweet Corn

Year: 2007





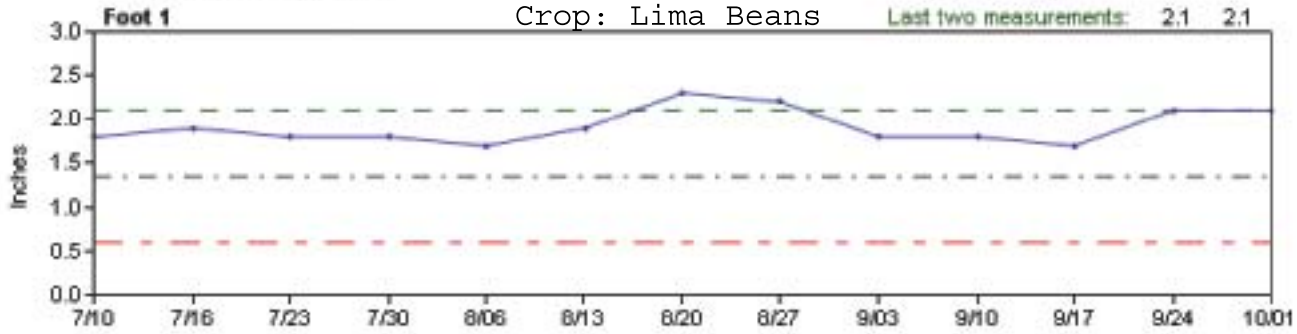
IRZ Consulting, LLC

Soil Moisture Graphs

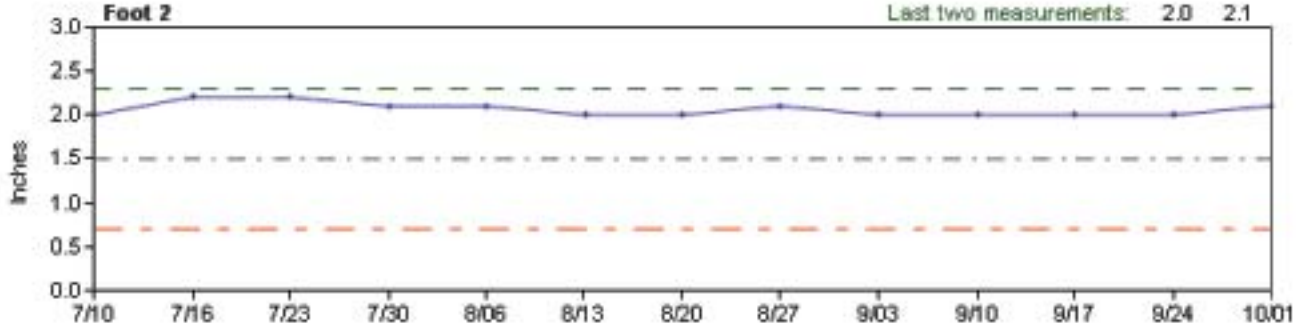
Field ID: 14
Crop: Lima Beans

Year: **2007**

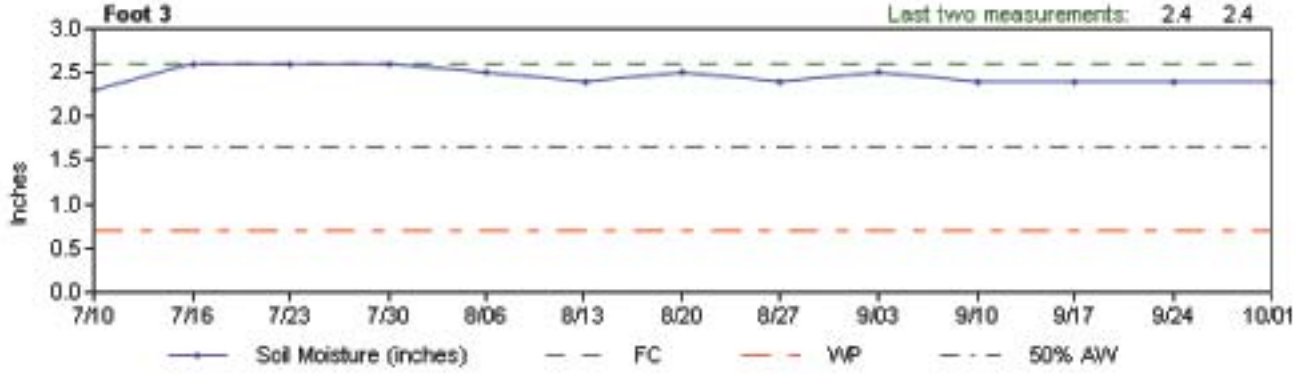
Foot 1 — Last two measurements: 2.1 2.1



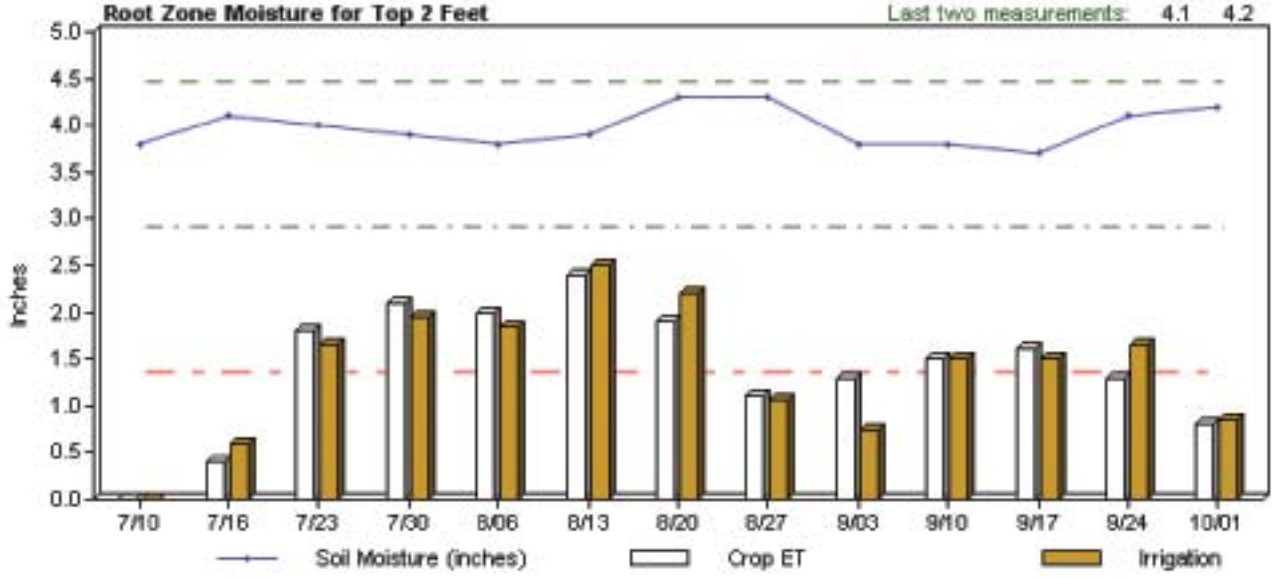
Foot 2 — Last two measurements: 2.0 2.1



Foot 3 — Last two measurements: 2.4 2.4



Root Zone Moisture for Top 2 Feet — Last two measurements: 4.1 4.2



IRZ Consulting, LLC

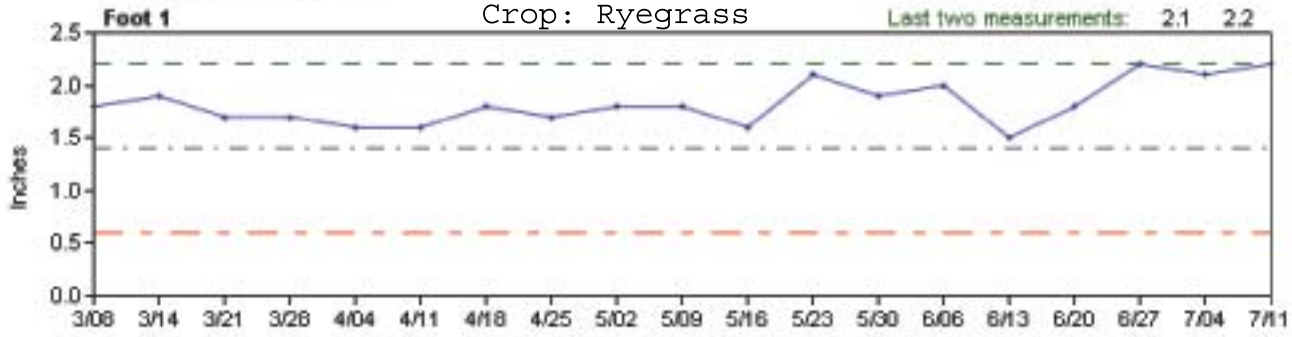
Soil Moisture Graphs

Field ID: 15
Crop: Ryegrass

Year: **2007**

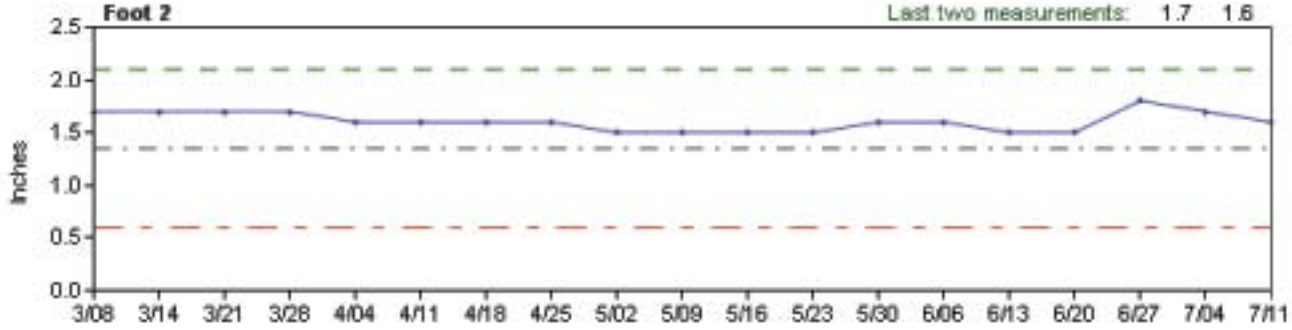
Foot 1

Last two measurements: 2.1 2.2



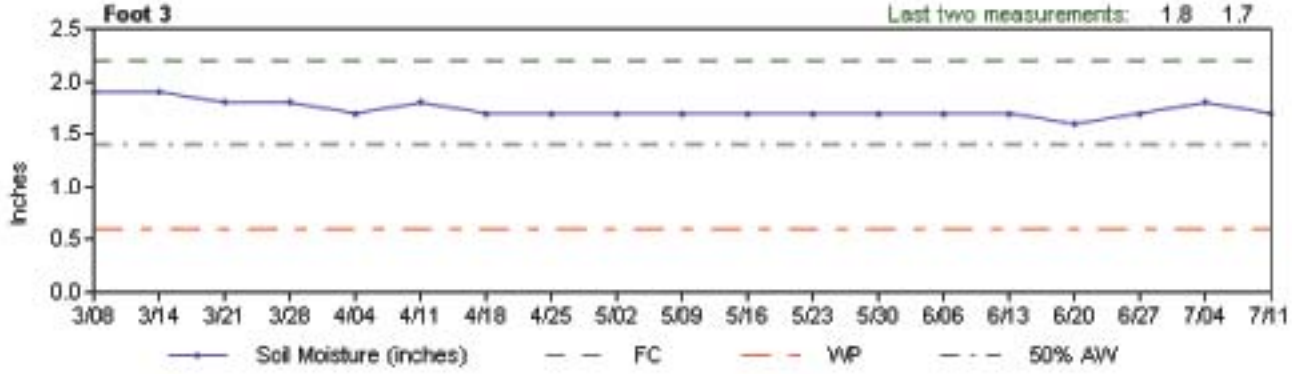
Foot 2

Last two measurements: 1.7 1.6



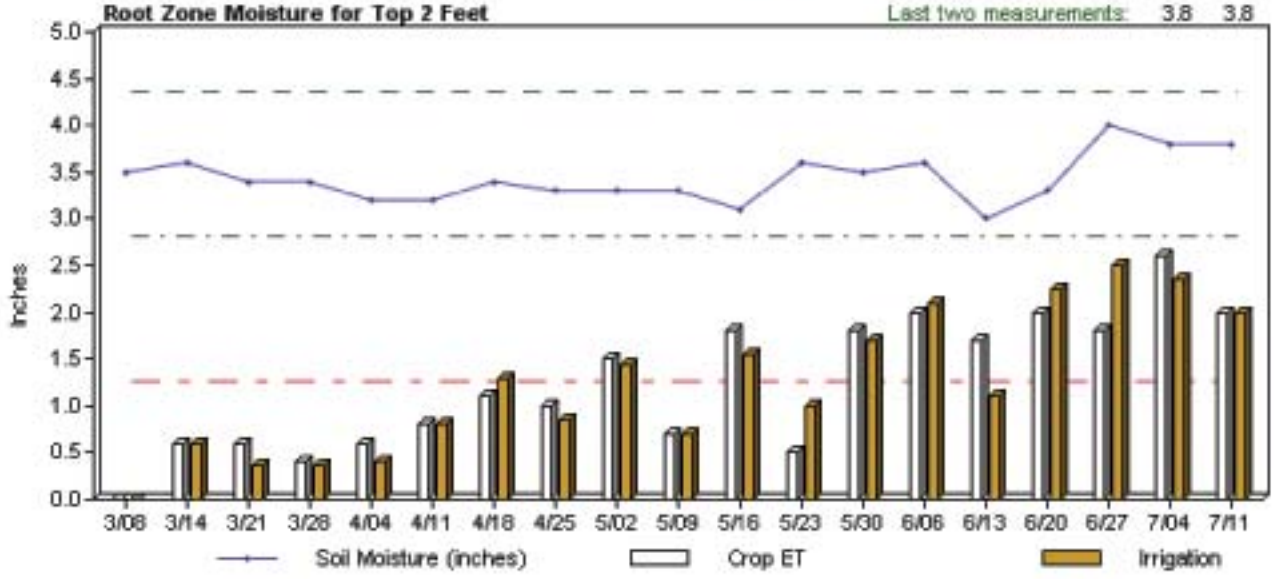
Foot 3

Last two measurements: 1.8 1.7



Root Zone Moisture for Top 2 Feet

Last two measurements: 3.8 3.8



IRZ Consulting, LLC

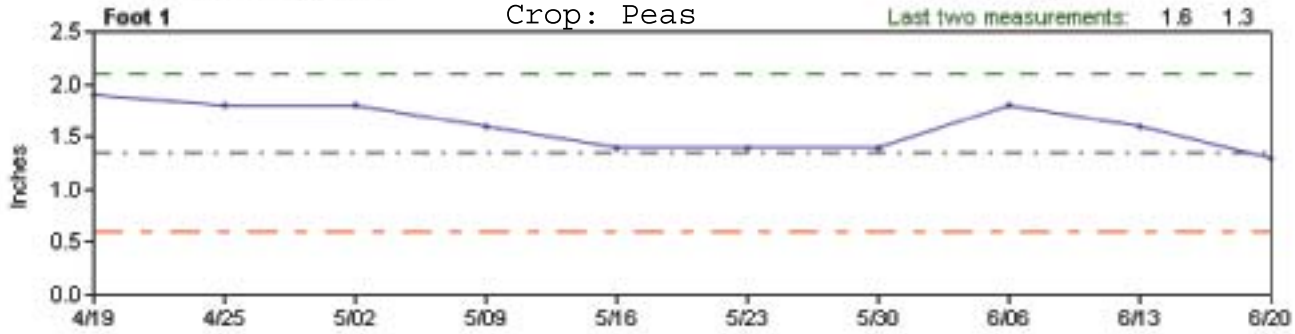
Soil Moisture Graphs

Field ID: 16
Crop: Peas

Year: **2007**

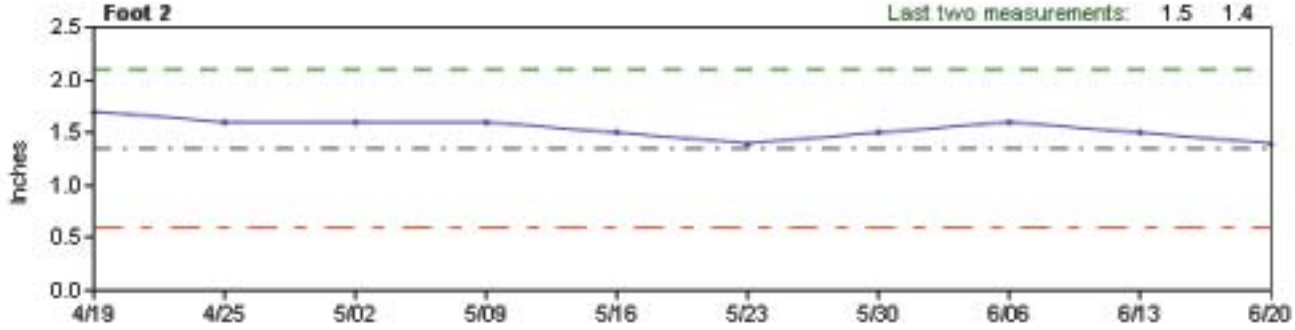
Foot 1

Last two measurements: 1.6 1.3



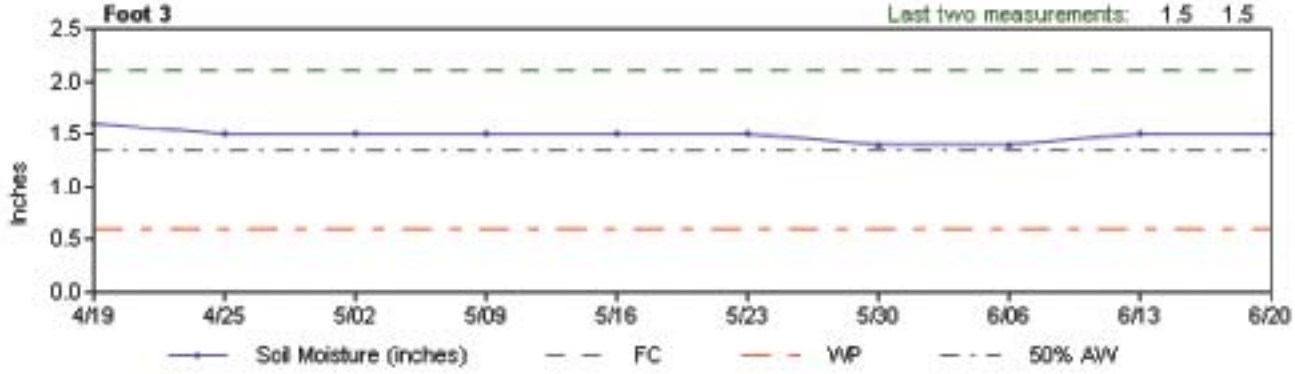
Foot 2

Last two measurements: 1.5 1.4



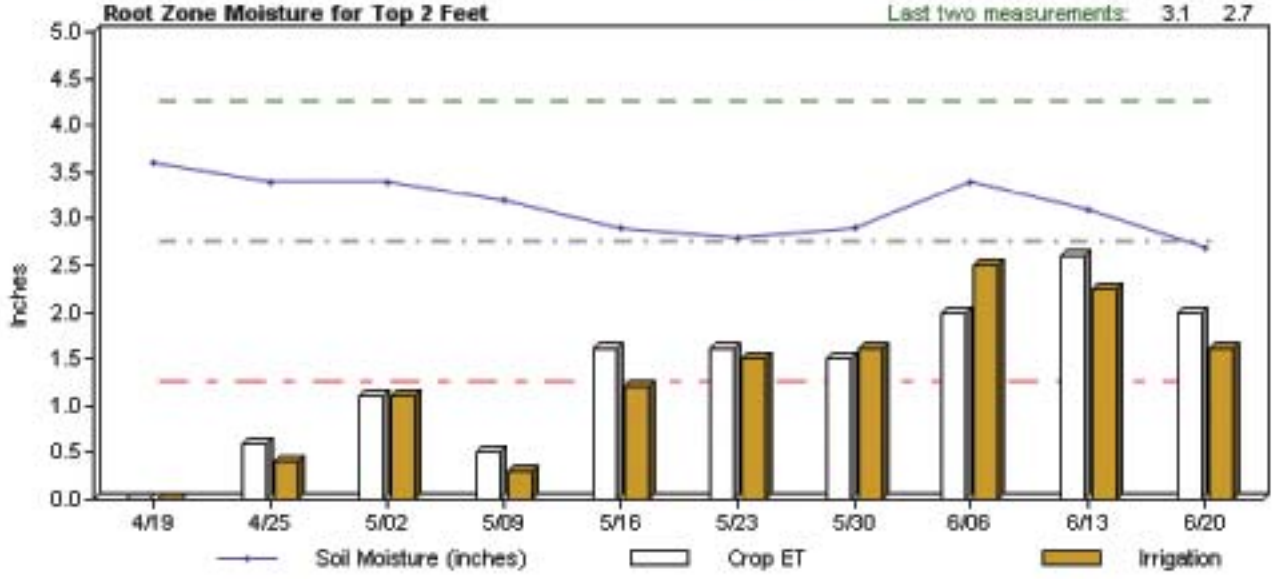
Foot 3

Last two measurements: 1.5 1.5



Root Zone Moisture for Top 2 Feet

Last two measurements: 3.1 2.7

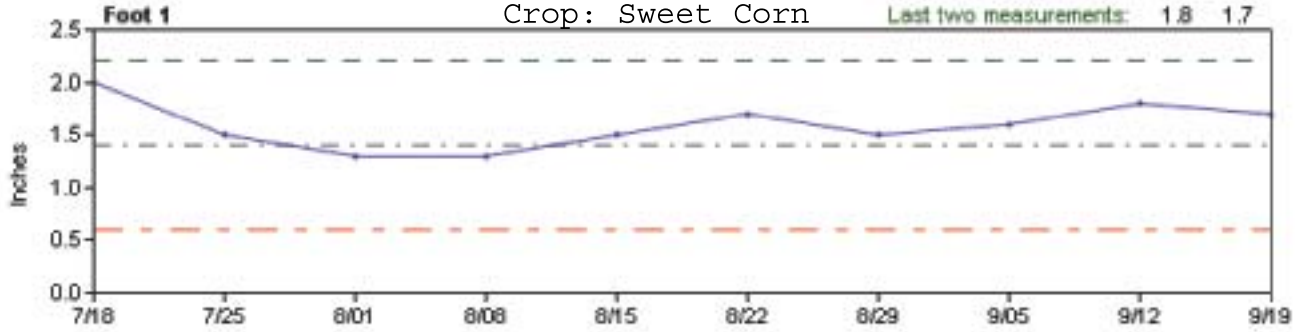


IRZ Consulting, LLC

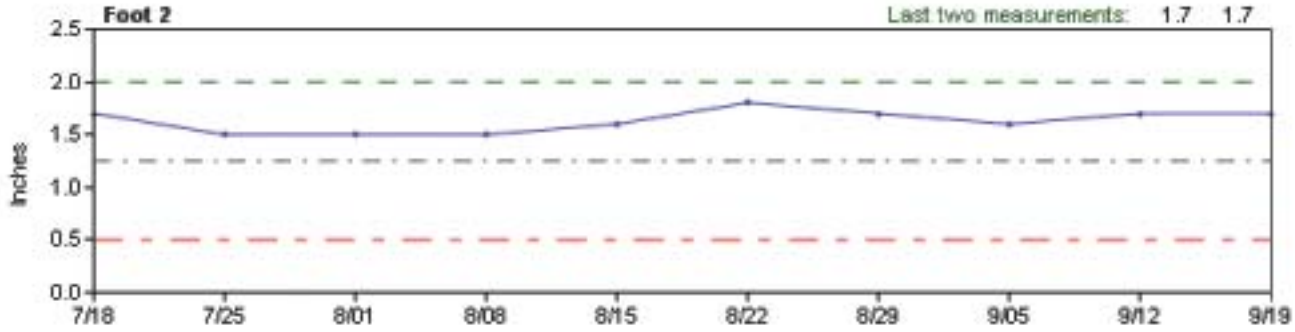
Soil Moisture Graphs Field ID: 17 Year: **2007**

Crop: Sweet Corn

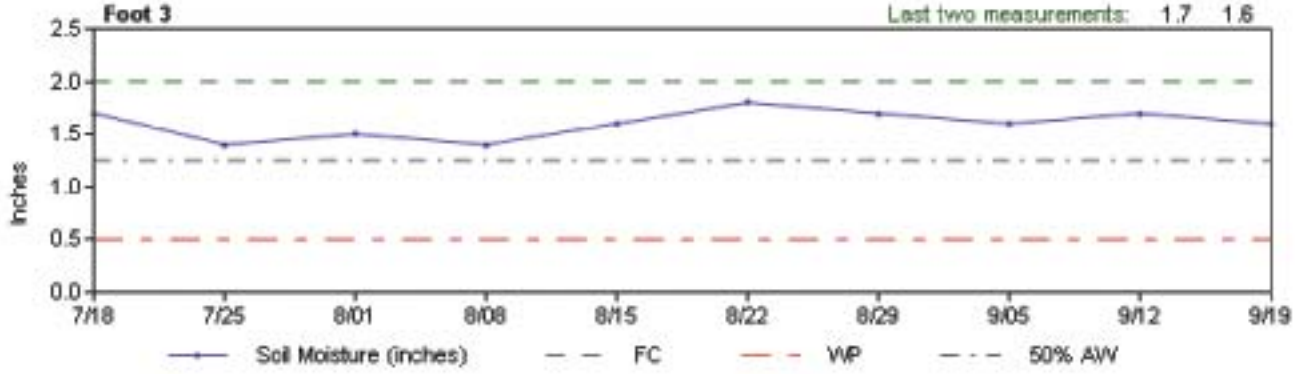
Foot 1 Last two measurements: 1.8 1.7



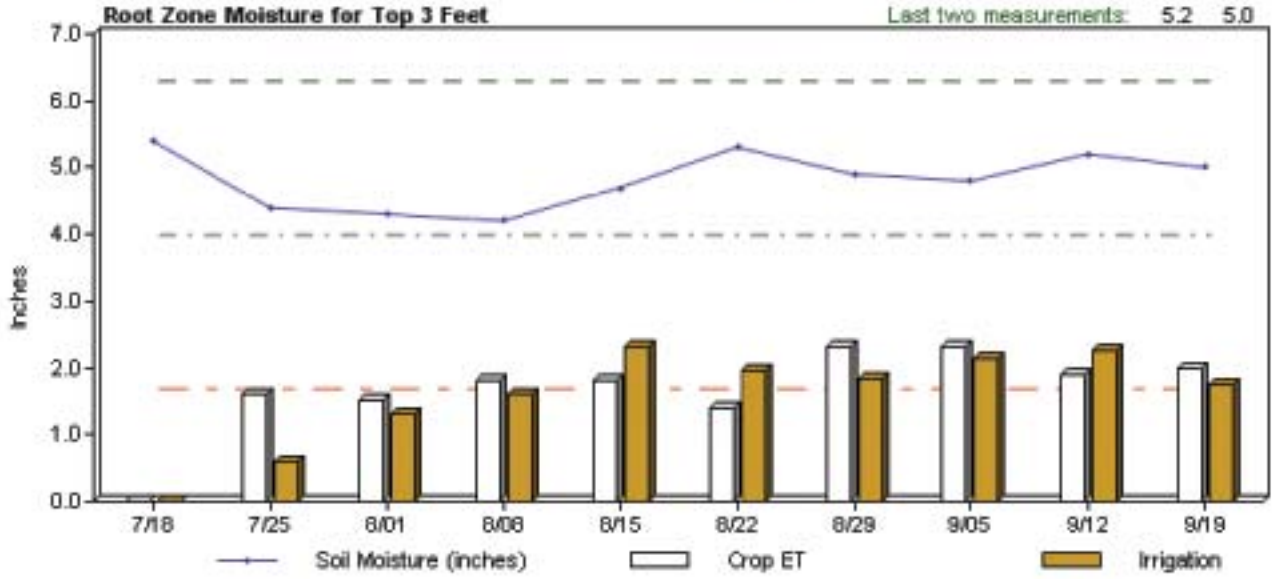
Foot 2 Last two measurements: 1.7 1.7



Foot 3 Last two measurements: 1.7 1.6



Root Zone Moisture for Top 3 Feet Last two measurements: 5.2 5.0



IRZ Consulting, LLC

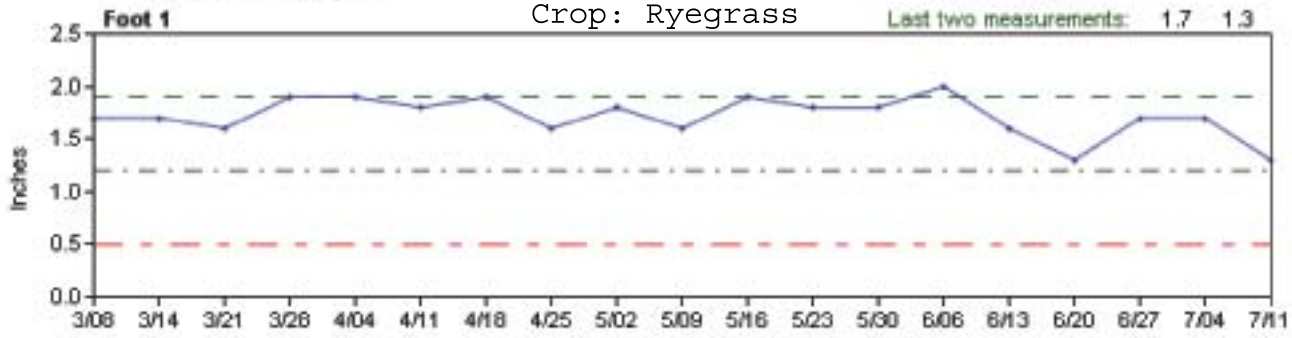
Field ID: 18
Crop: Ryegrass

Soil Moisture Graphs

Year: 2007

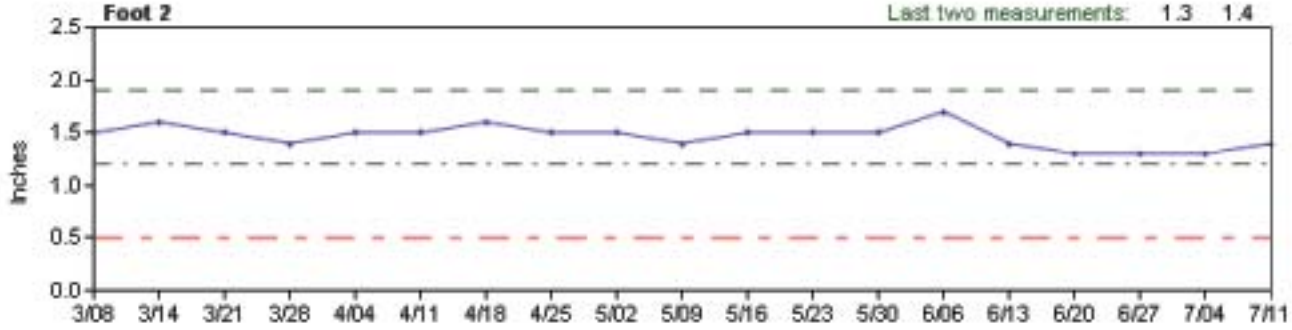
Foot 1

Last two measurements: 1.7 1.3



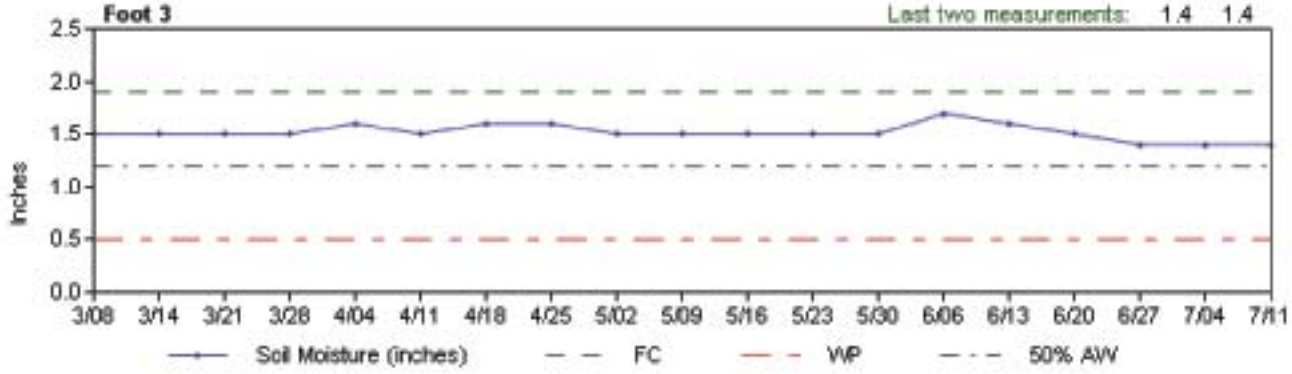
Foot 2

Last two measurements: 1.3 1.4



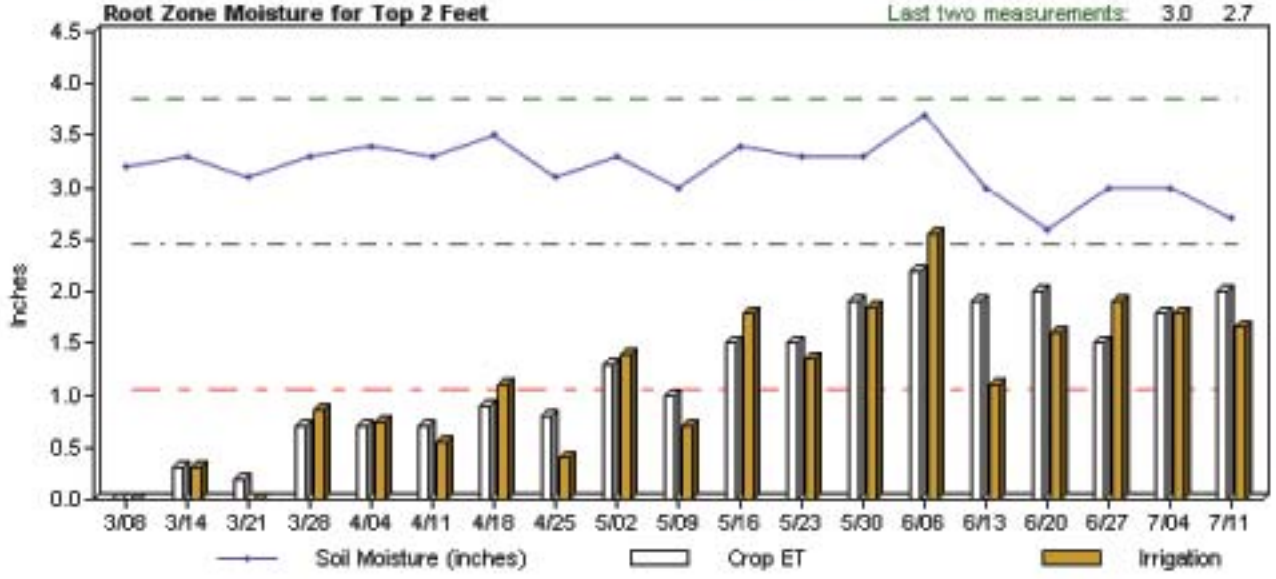
Foot 3

Last two measurements: 1.4 1.4



Root Zone Moisture for Top 2 Feet

Last two measurements: 3.0 2.7

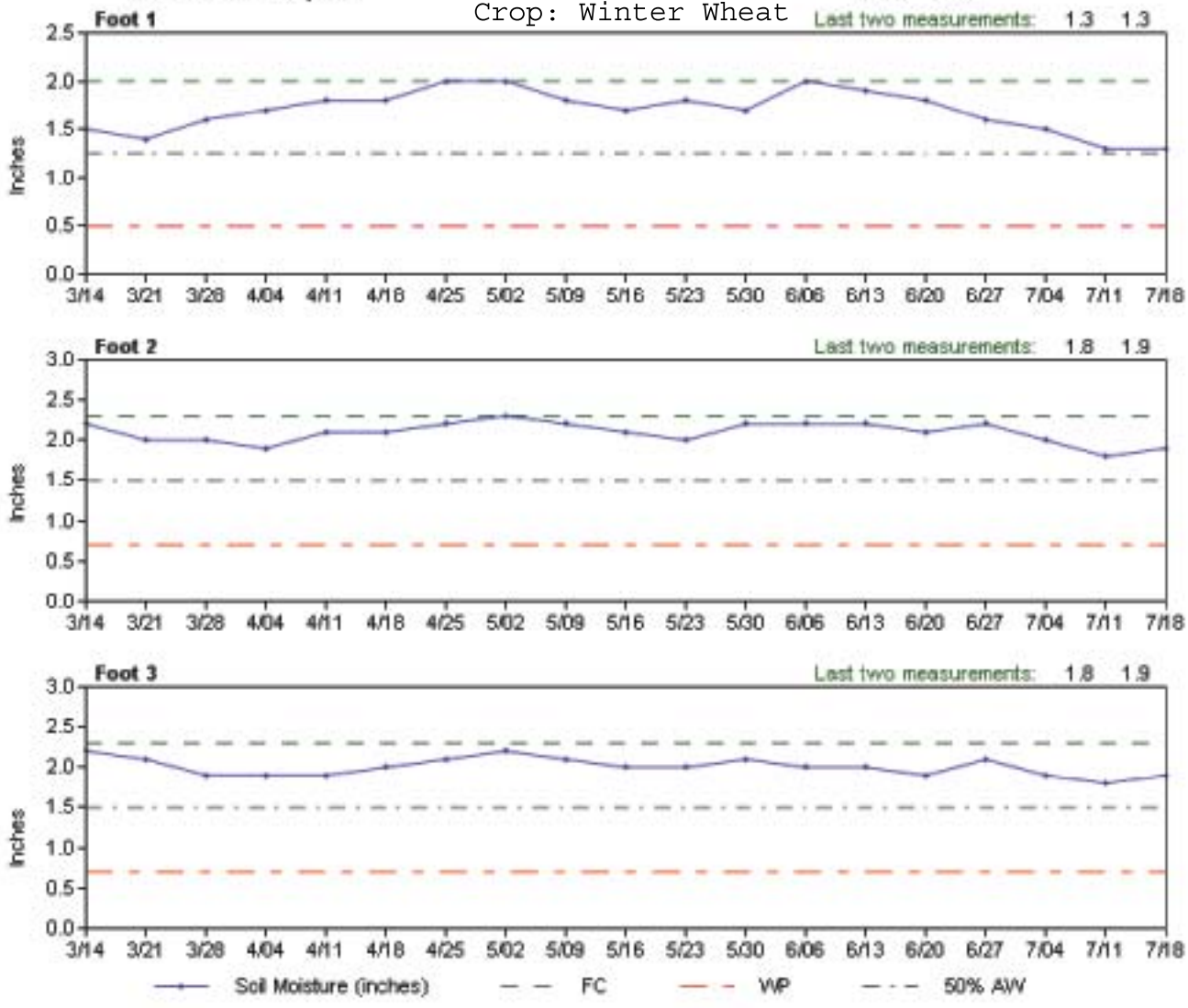


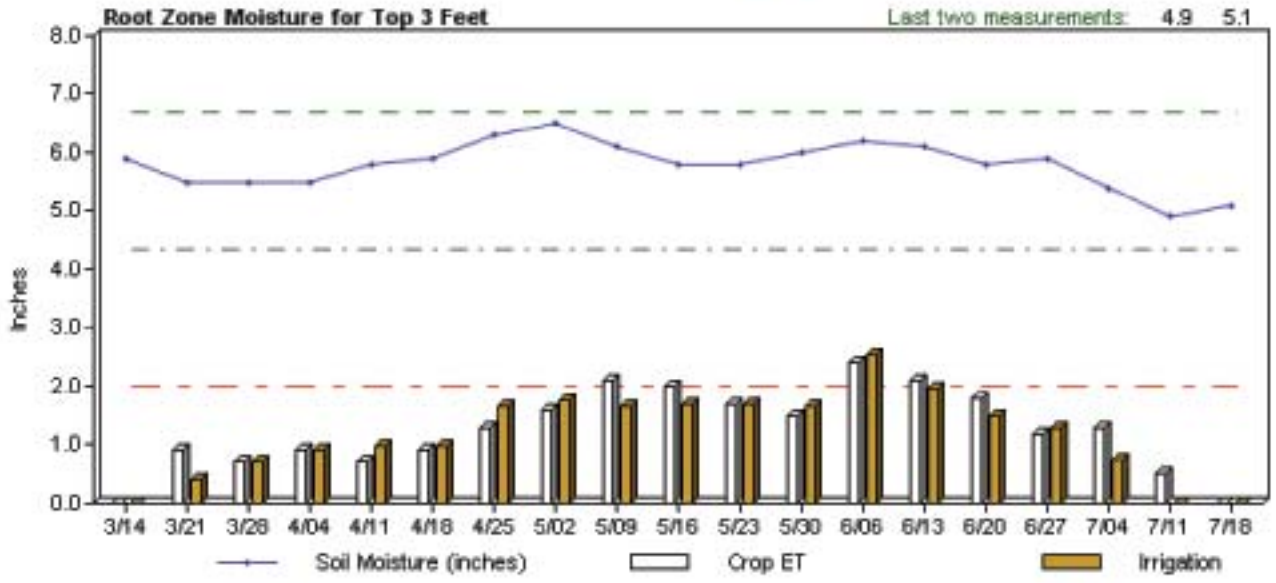
IRZ Consulting, LLC

Field ID: 19
Crop: Winter Wheat

Soil Moisture Graphs

Year: 2007





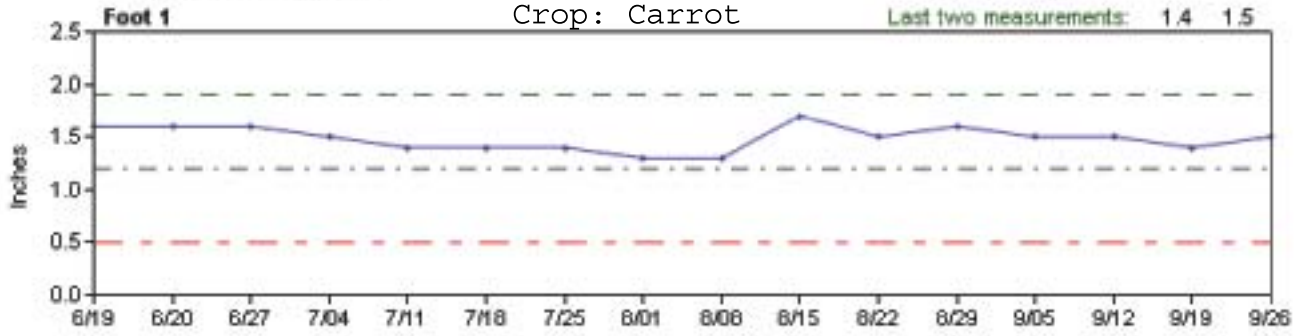
IRZ Consulting, LLC

Soil Moisture Graphs

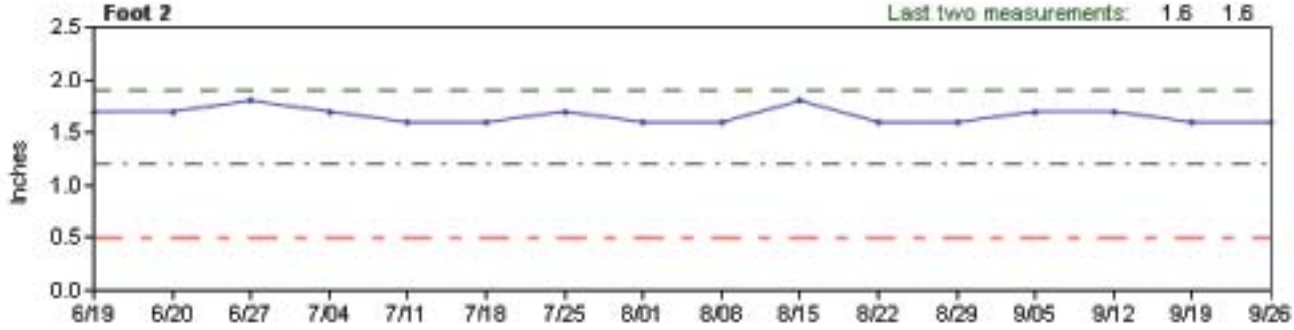
Field ID: 20
Crop: Carrot

Year: **2007**

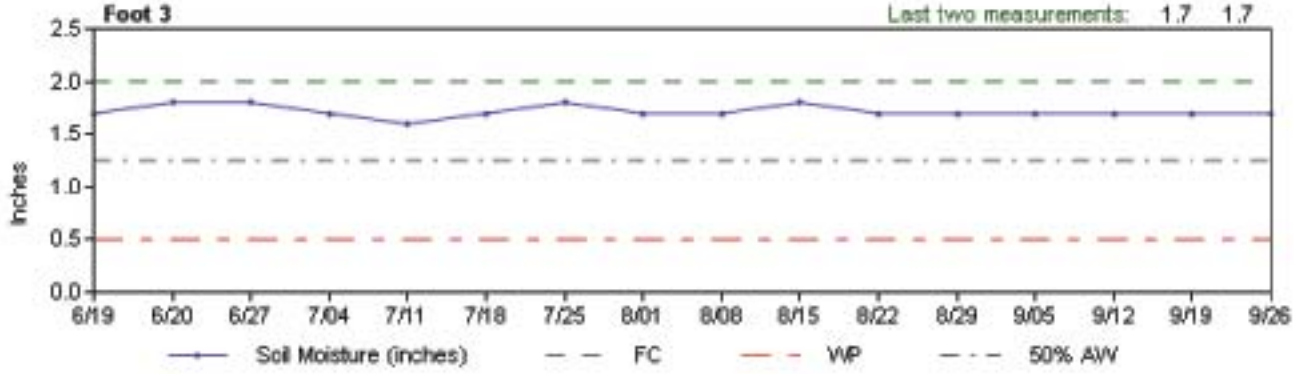
Foot 1 — Last two measurements: 1.4 1.5



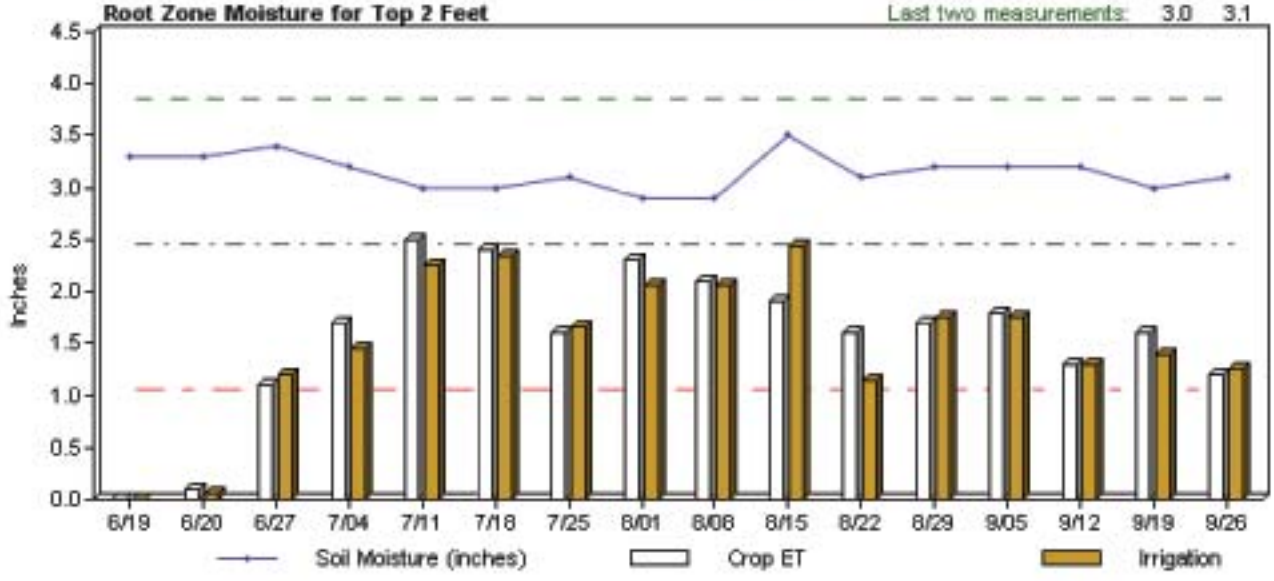
Foot 2 — Last two measurements: 1.6 1.6



Foot 3 — Last two measurements: 1.7 1.7



Root Zone Moisture for Top 2 Feet — Last two measurements: 3.0 3.1



IRZ Consulting, LLC

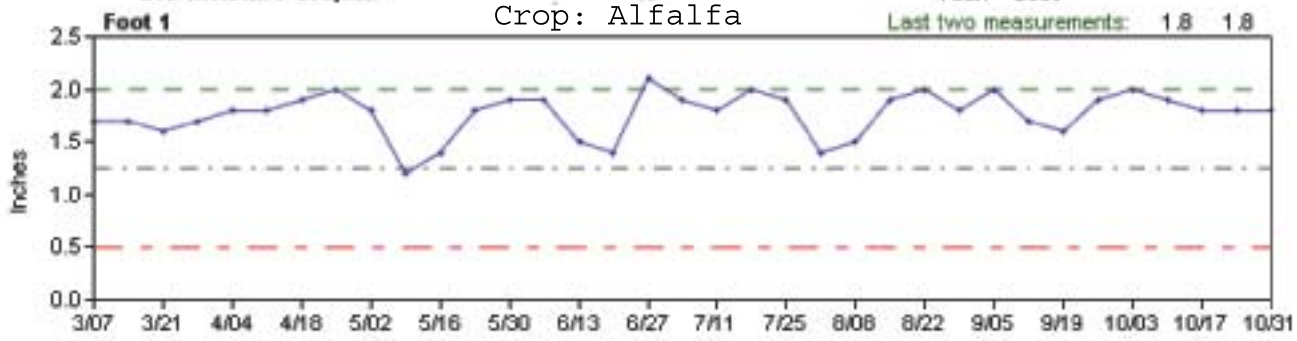
Field ID: 21
Crop: Alfalfa

Soil Moisture Graphs

Year: **2007**

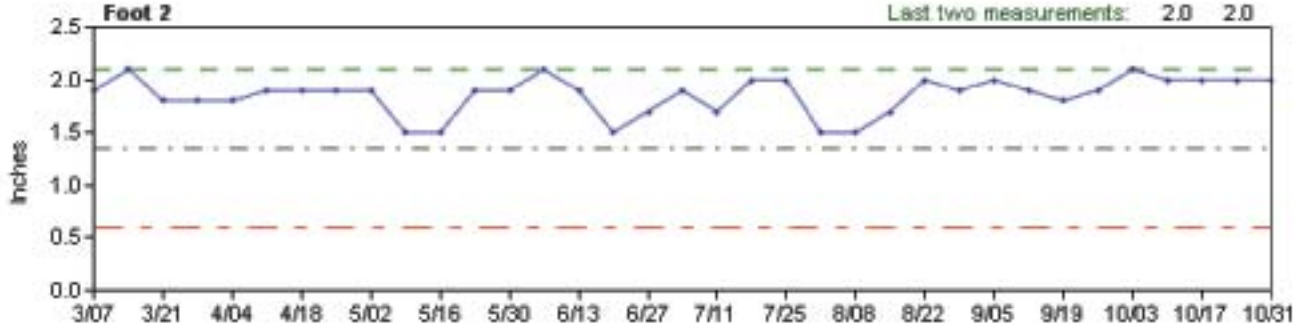
Foot 1

Last two measurements: 1.8 1.8



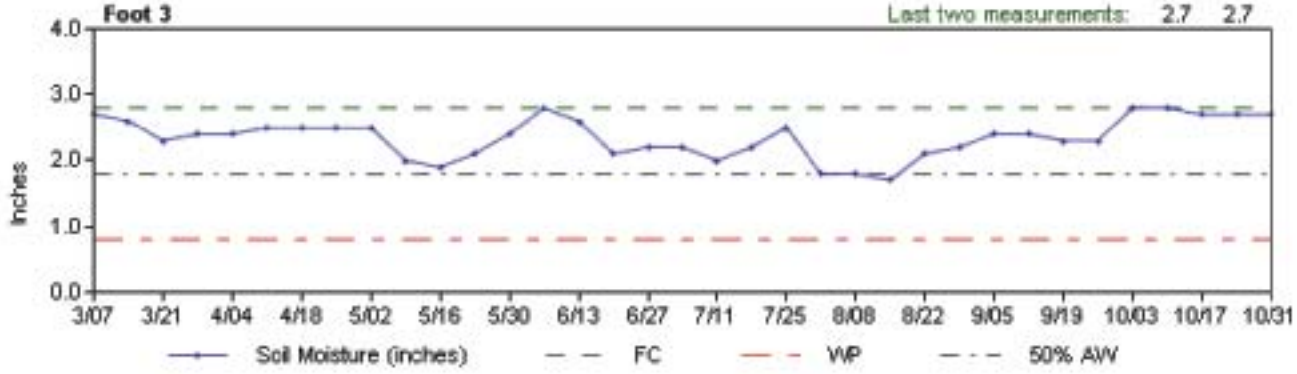
Foot 2

Last two measurements: 2.0 2.0



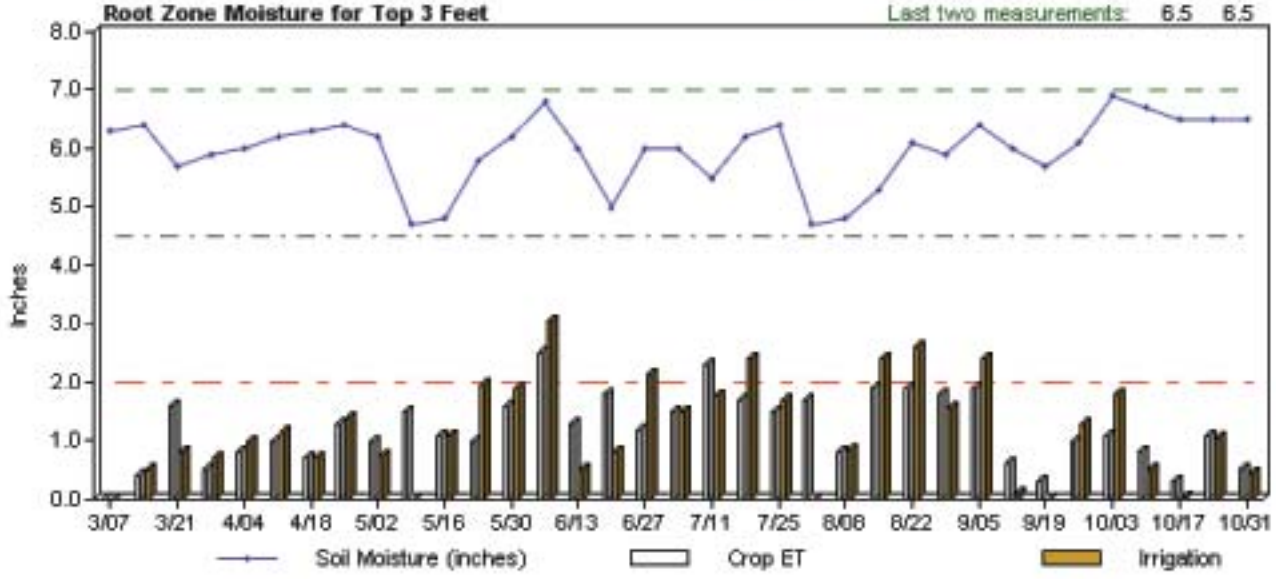
Foot 3

Last two measurements: 2.7 2.7



Root Zone Moisture for Top 3 Feet

Last two measurements: 6.5 6.5

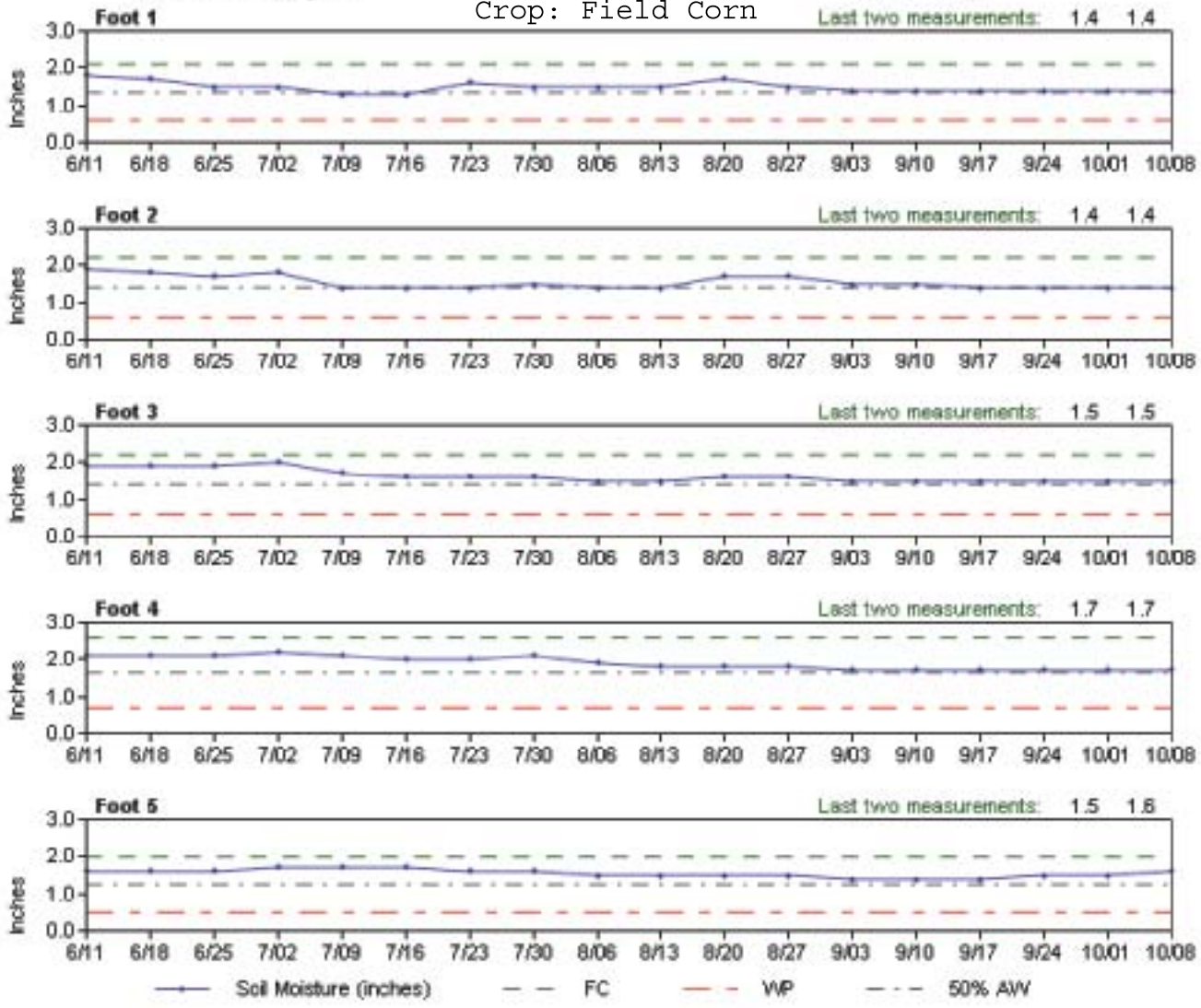


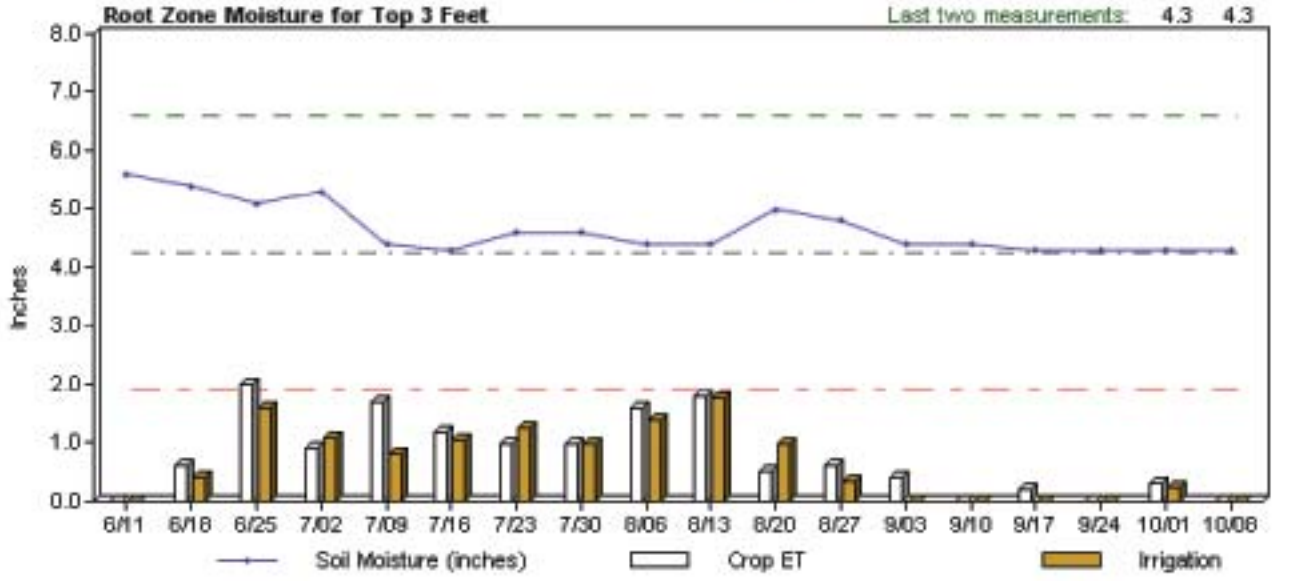
IRZ Consulting, LLC

Field ID: 22
Crop: Field Corn

Soil Moisture Graphs

Year: 2007





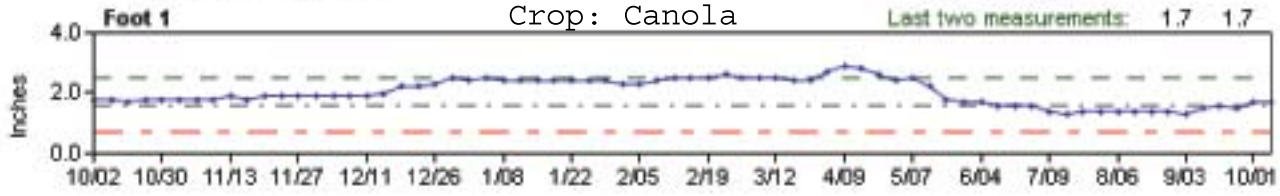
IRZ Consulting, LLC

Soil Moisture Graphs

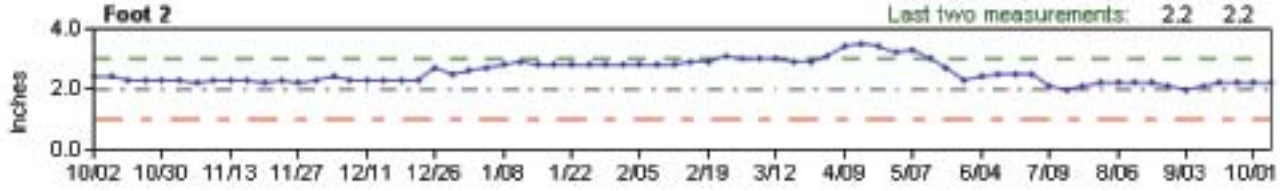
Field ID: 23
Crop: Canola

Year: **2007**

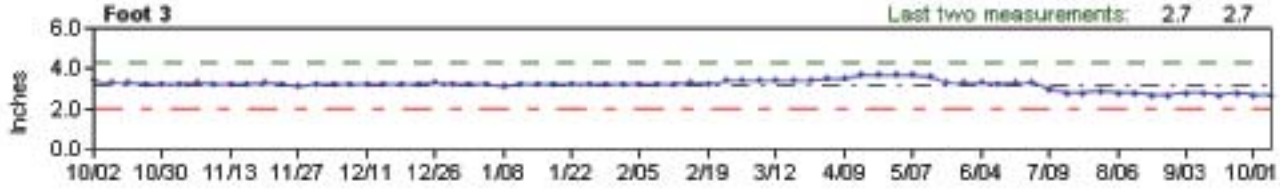
Foot 1 Last two measurements: 1.7 1.7



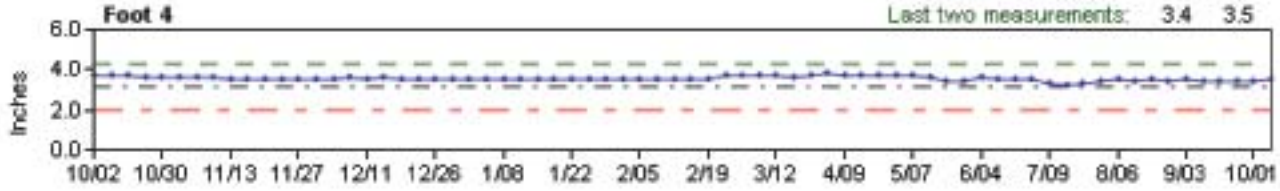
Foot 2 Last two measurements: 2.2 2.2



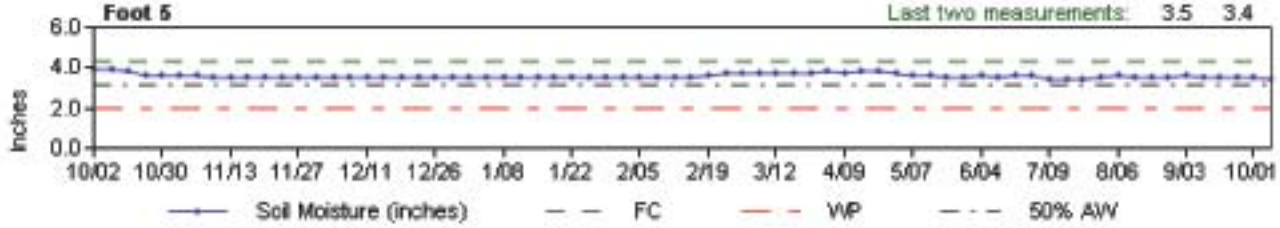
Foot 3 Last two measurements: 2.7 2.7



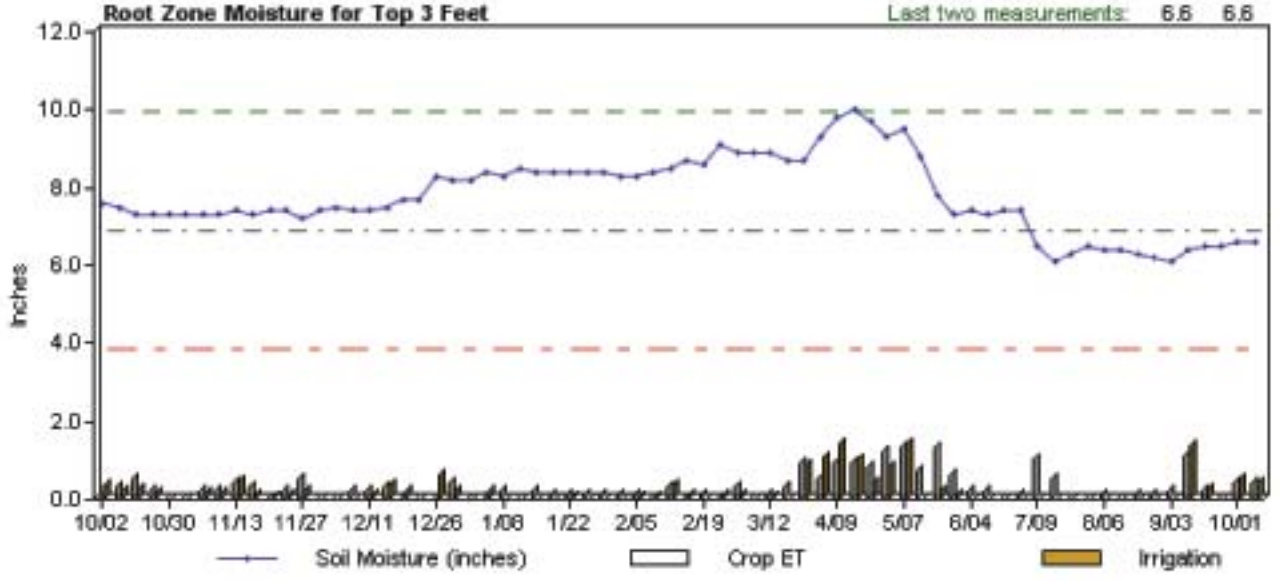
Foot 4 Last two measurements: 3.4 3.5



Foot 5 Last two measurements: 3.5 3.4



Root Zone Moisture for Top 3 Feet Last two measurements: 6.6 6.6

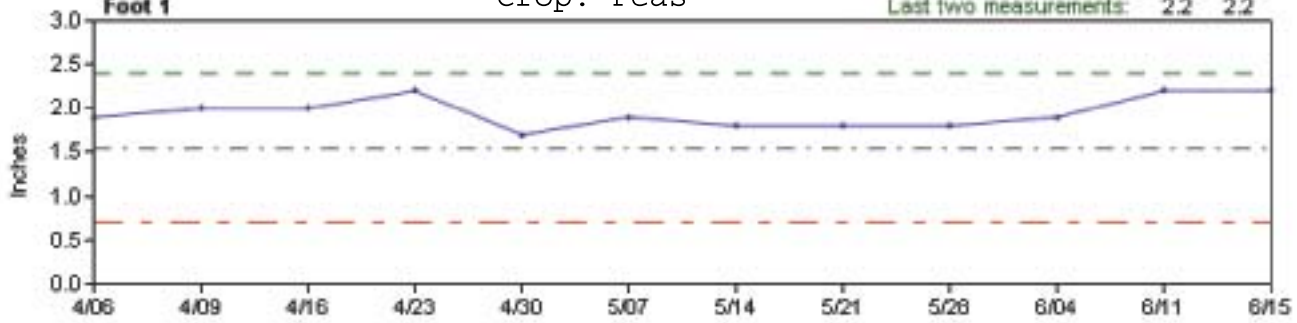


IRZ Consulting, LLC

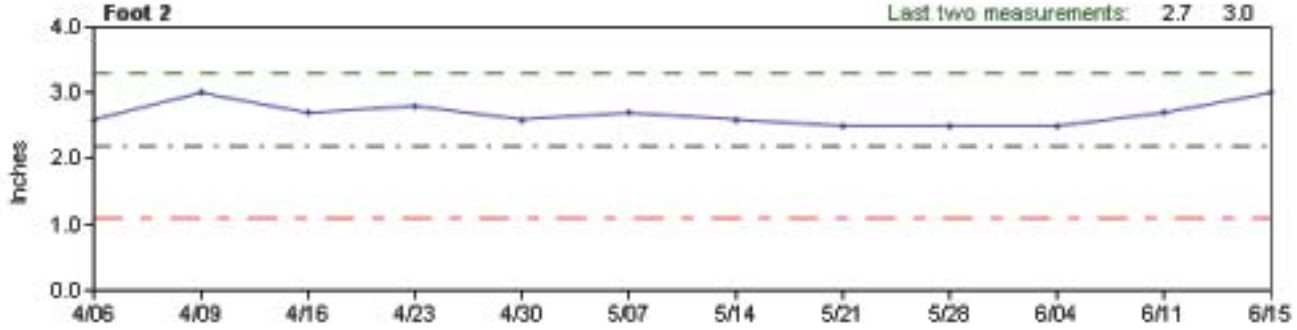
Field ID: 24
Crop: Peas

Soil Moisture Graphs Year: **2007**

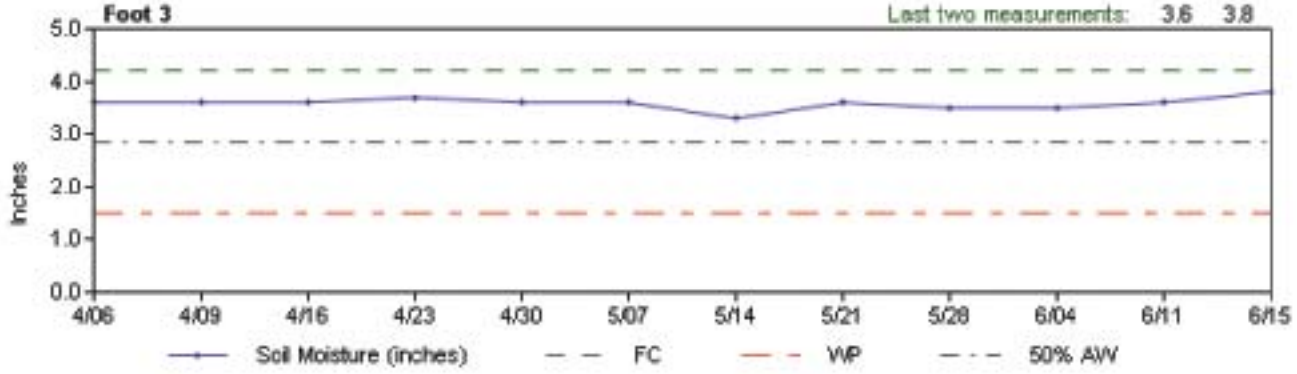
Foot 1 Last two measurements: 2.2 2.2



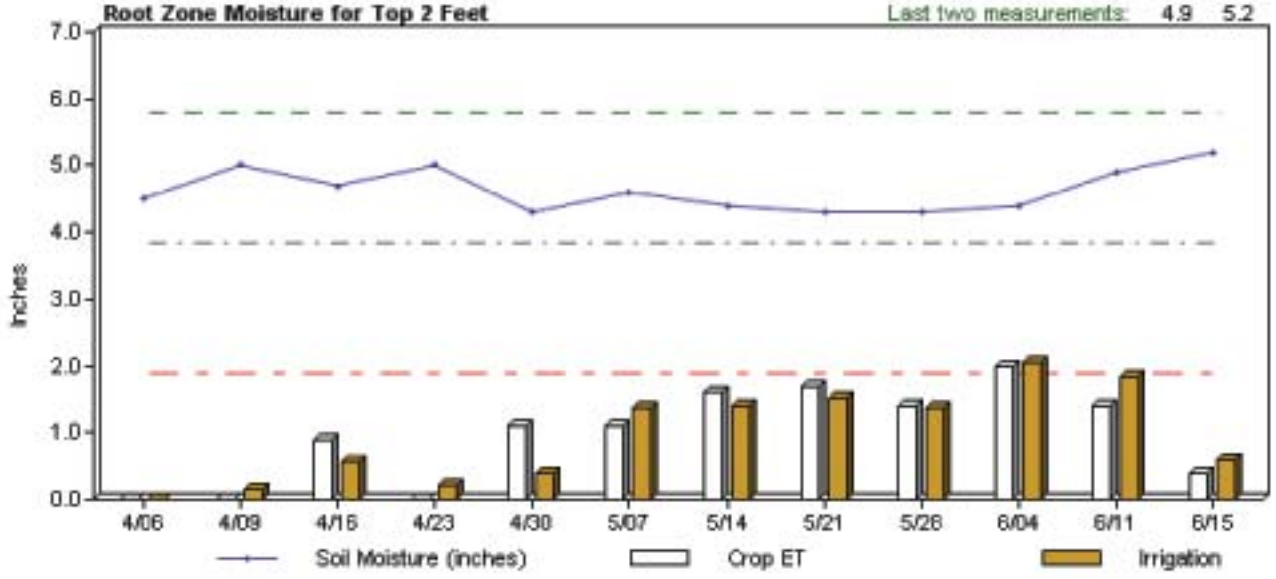
Foot 2 Last two measurements: 2.7 3.0



Foot 3 Last two measurements: 3.6 3.8



Root Zone Moisture for Top 2 Feet Last two measurements: 4.9 5.2



IRZ Consulting, LLC

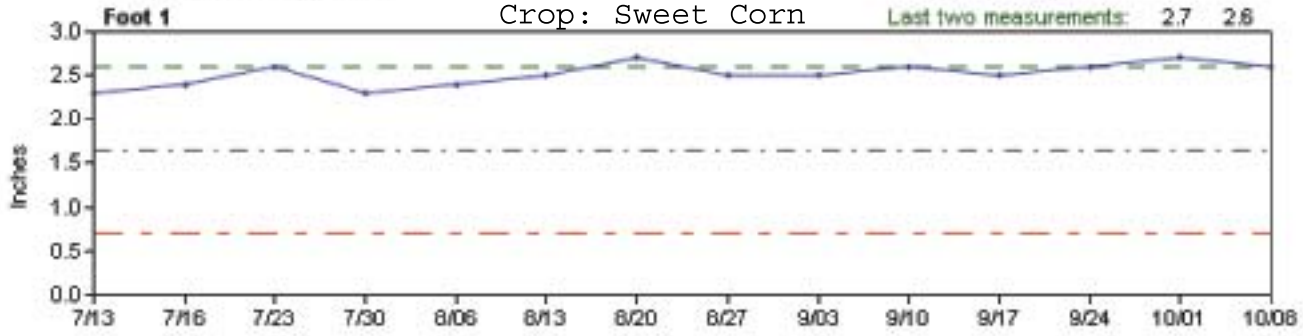
Soil Moisture Graphs

Field ID: 25
Crop: Sweet Corn

Year: **2007**

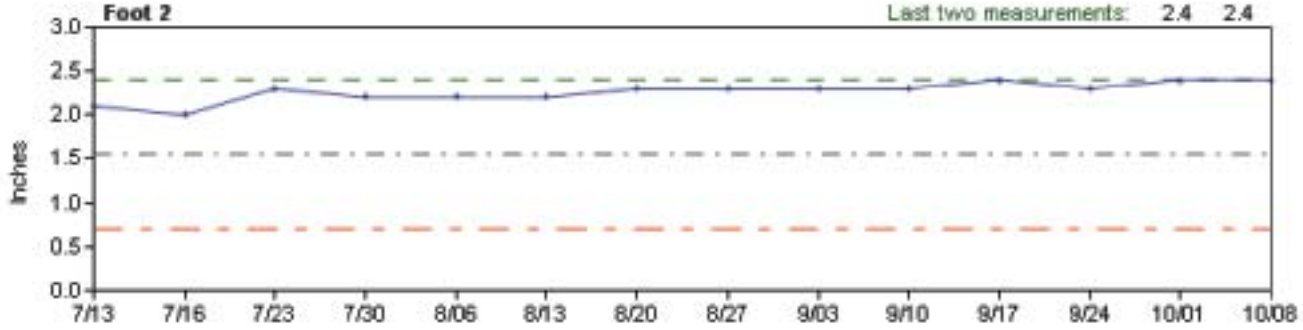
Foot 1

Last two measurements: 2.7 2.6



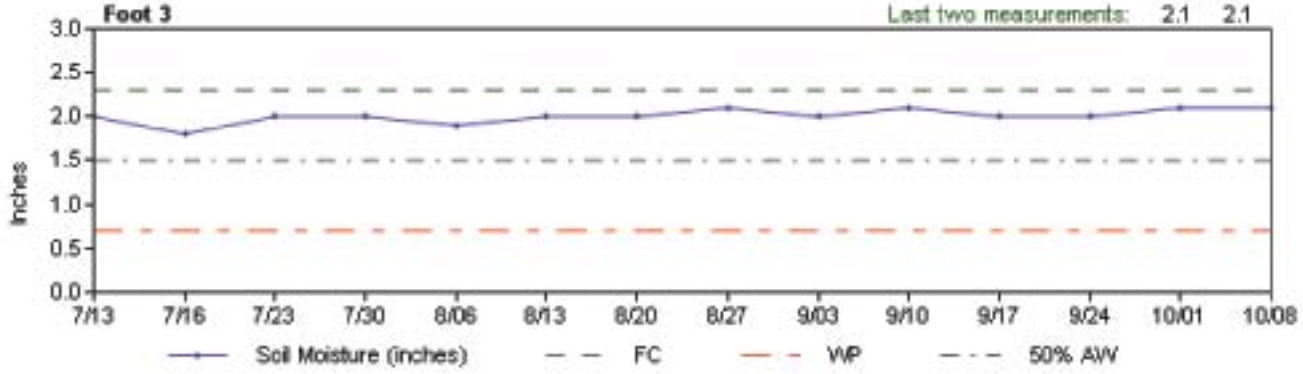
Foot 2

Last two measurements: 2.4 2.4



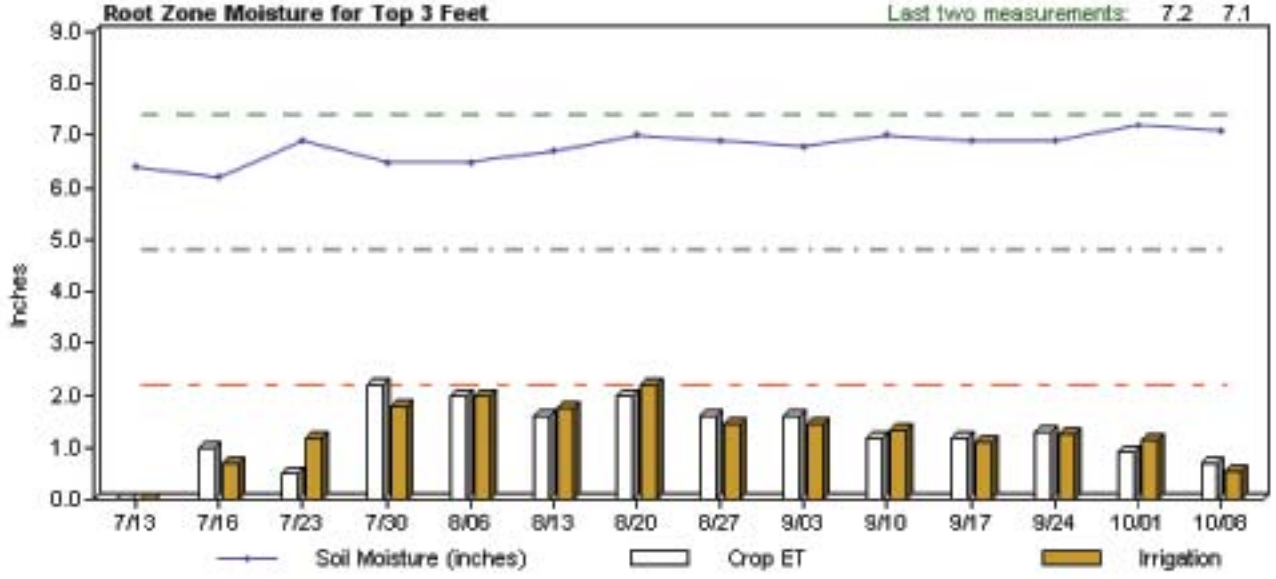
Foot 3

Last two measurements: 2.1 2.1



Root Zone Moisture for Top 3 Feet

Last two measurements: 7.2 7.1

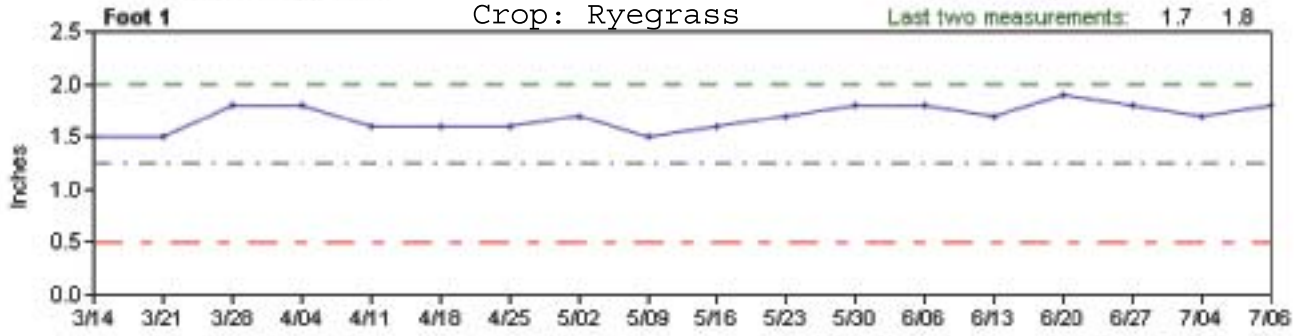


IRZ Consulting, LLC

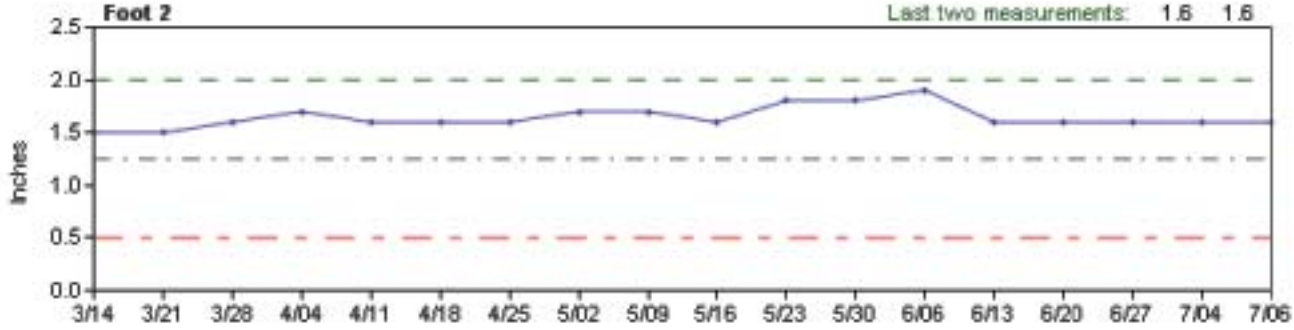
Soil Moisture Graphs Field ID: 26 Year: **2007**

Crop: Ryegrass

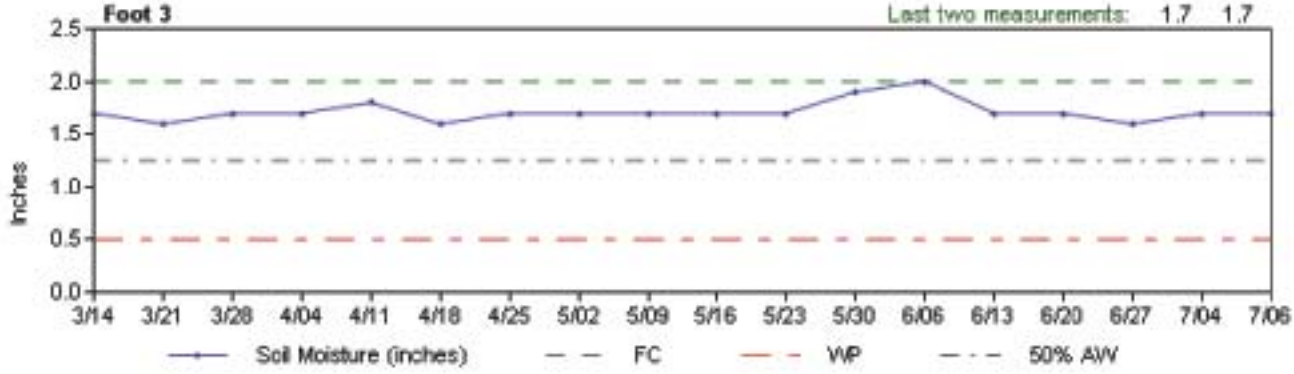
Foot 1 Last two measurements: 1.7 1.8



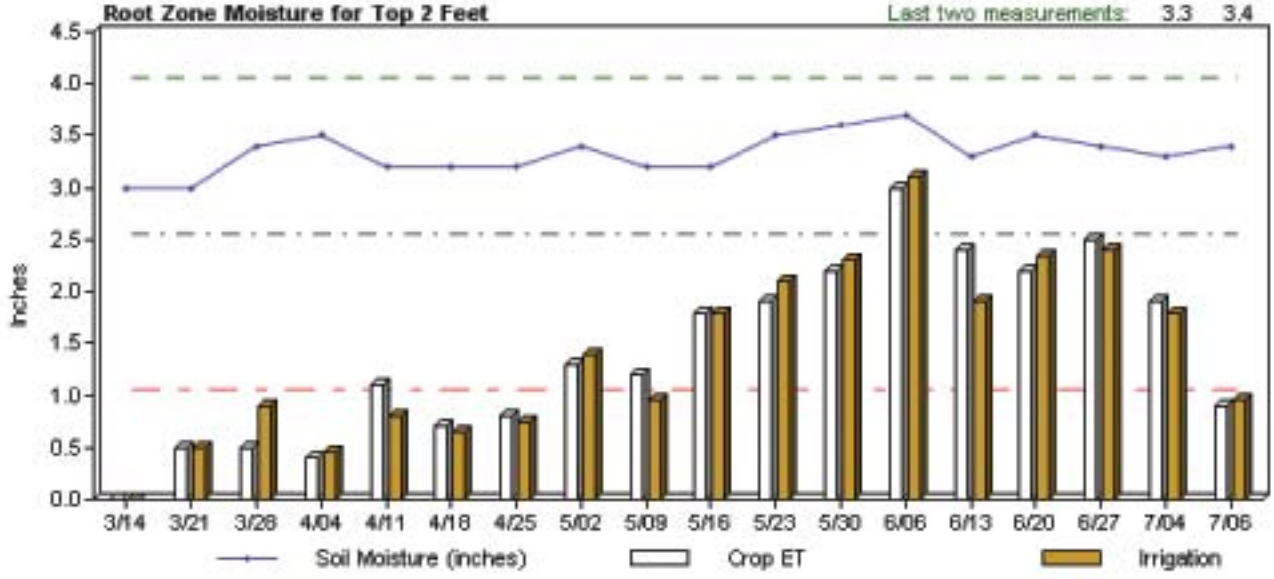
Foot 2 Last two measurements: 1.6 1.6



Foot 3 Last two measurements: 1.7 1.7



Root Zone Moisture for Top 2 Feet Last two measurements: 3.3 3.4



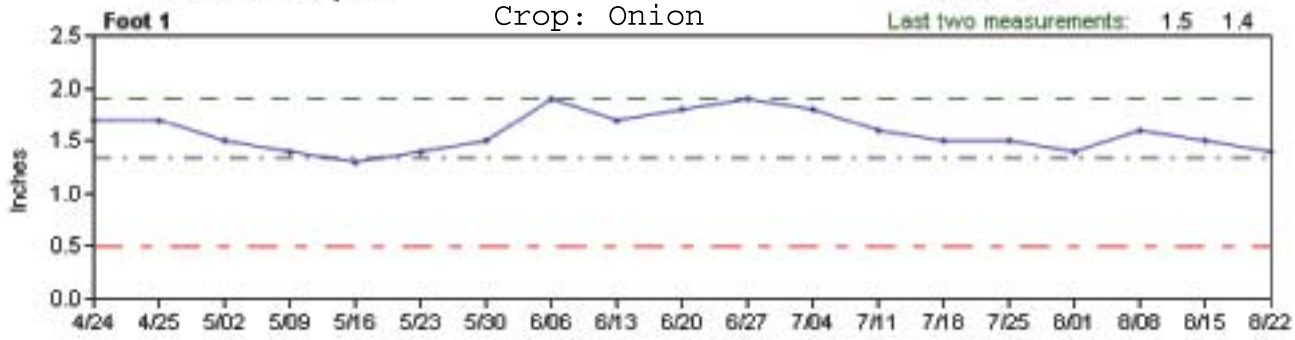
IRZ Consulting, LLC

Soil Moisture Graphs

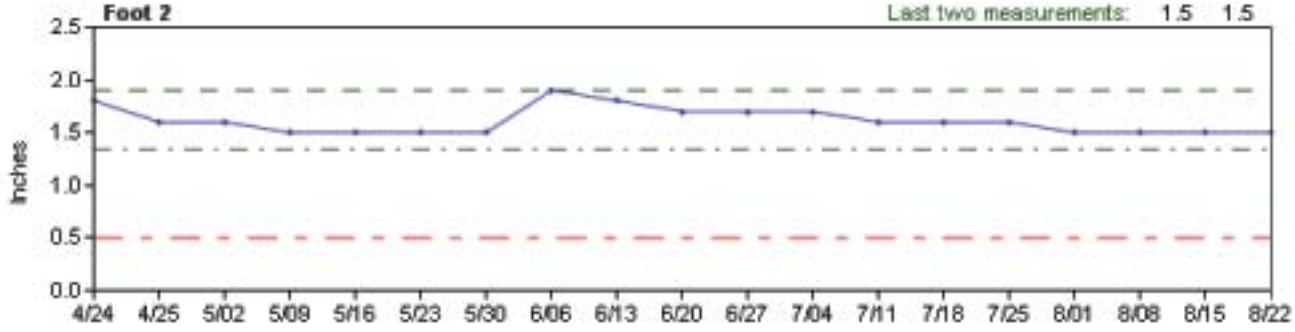
Field ID: 27
Crop: Onion

Year: **2007**

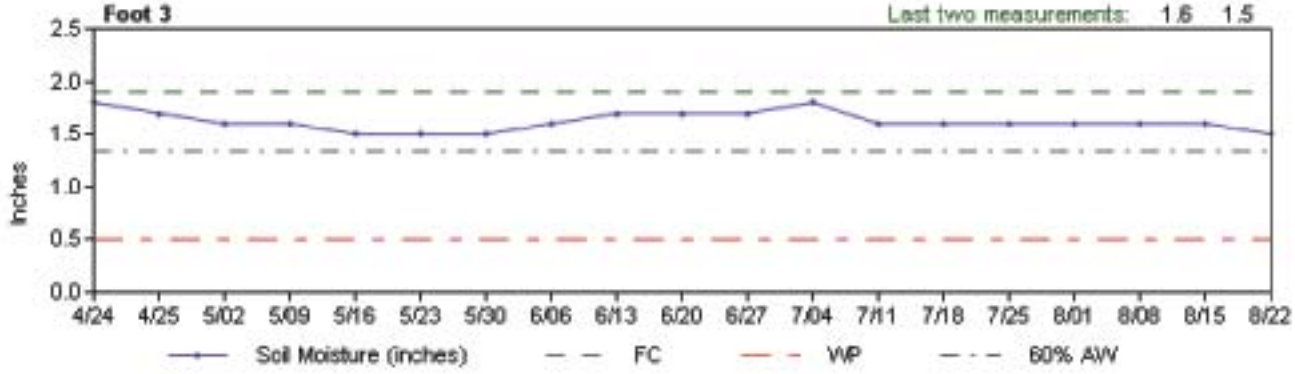
Foot 1 Last two measurements: 1.5 1.4



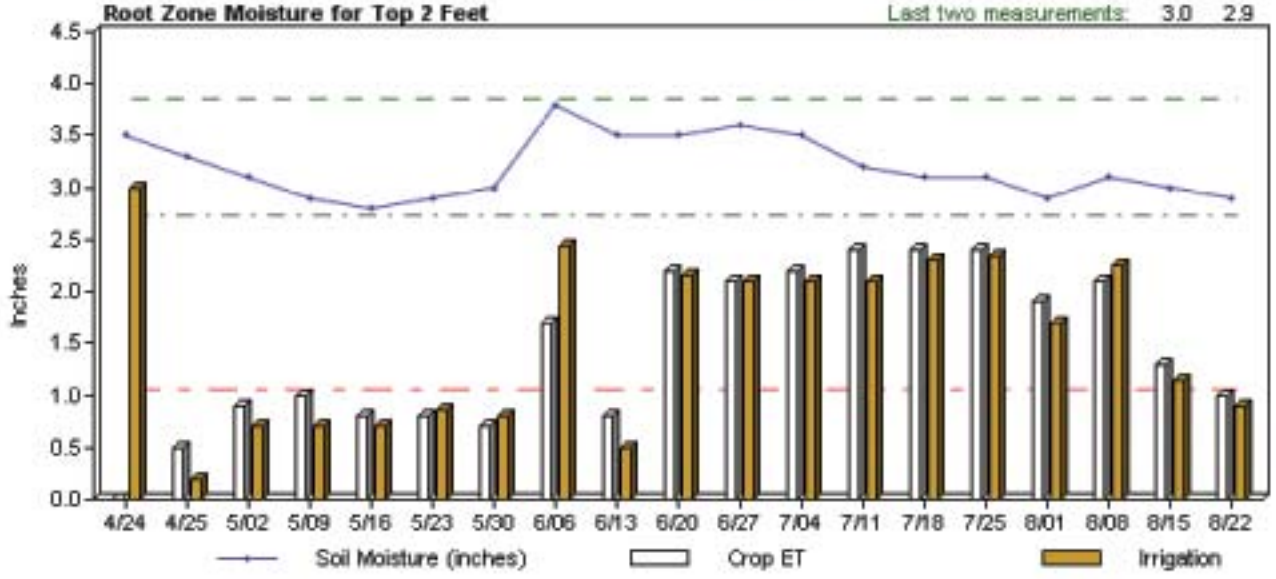
Foot 2 Last two measurements: 1.5 1.5



Foot 3 Last two measurements: 1.6 1.5



Root Zone Moisture for Top 2 Feet Last two measurements: 3.0 2.9



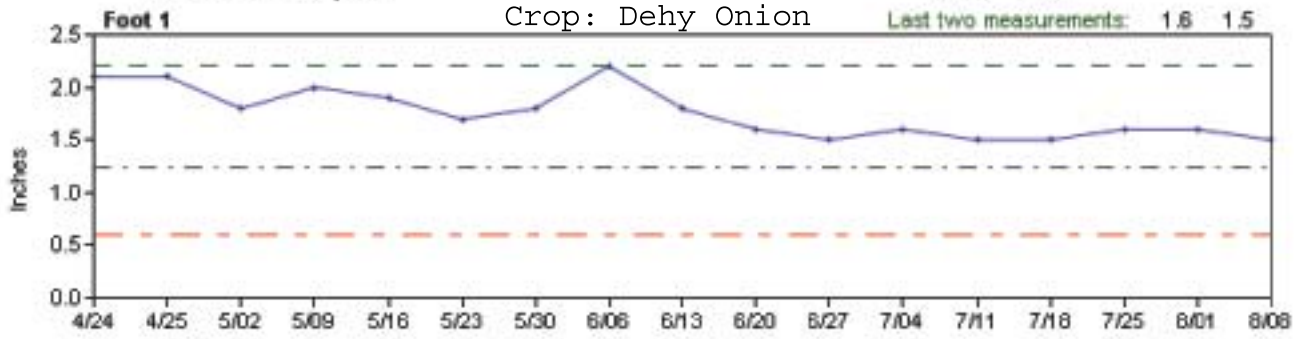
IRZ Consulting, LLC

Soil Moisture Graphs

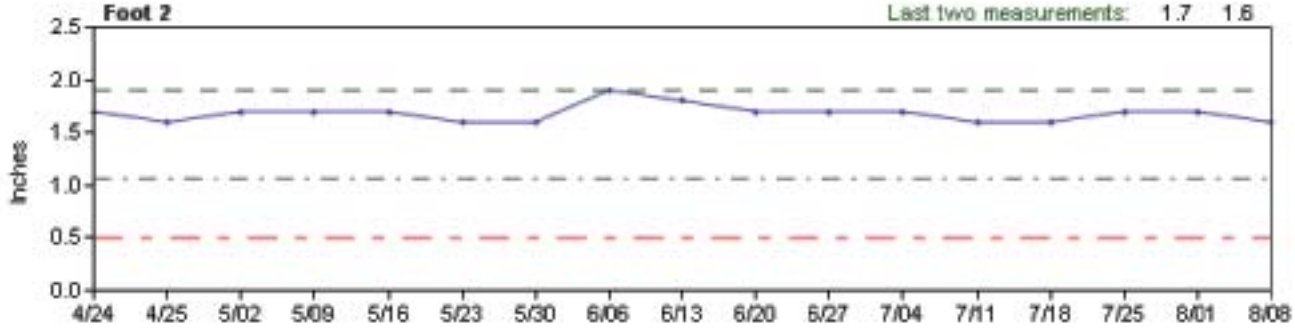
Field ID: 28
Crop: Dehy Onion

Year: **2007**

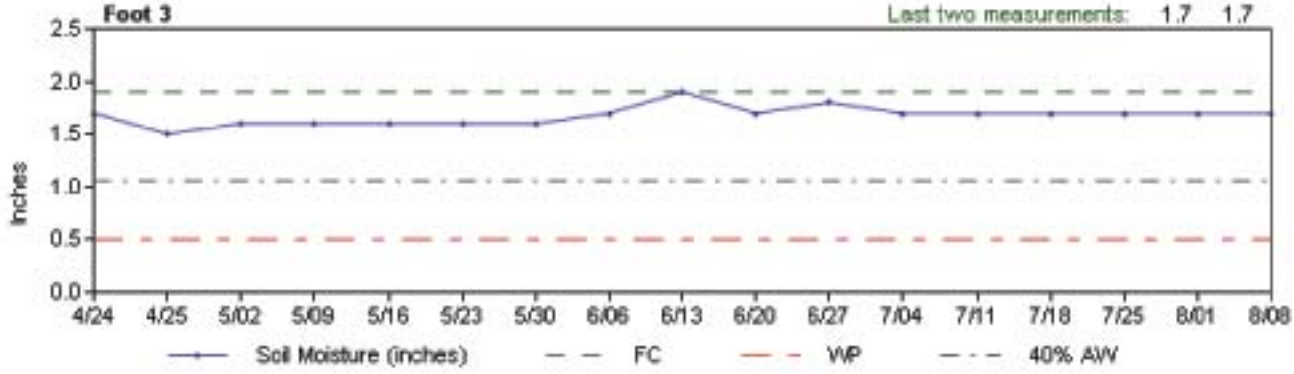
Foot 1 — Last two measurements: 1.6 1.5



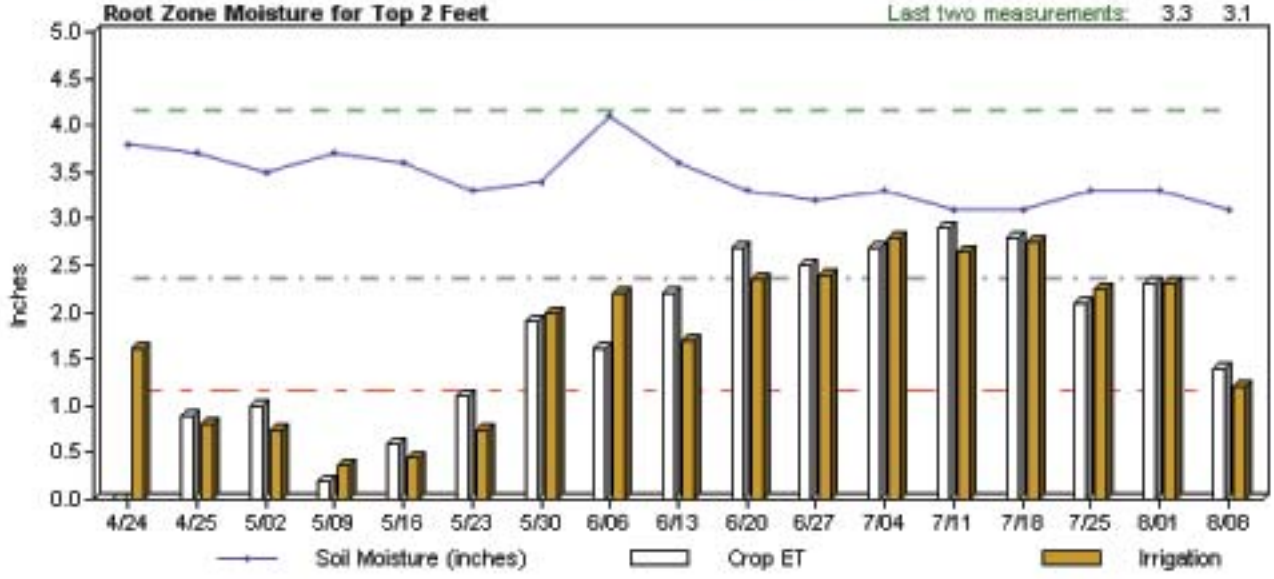
Foot 2 — Last two measurements: 1.7 1.6



Foot 3 — Last two measurements: 1.7 1.7



Root Zone Moisture for Top 2 Feet — Last two measurements: 3.3 3.1



IRZ Consulting, LLC

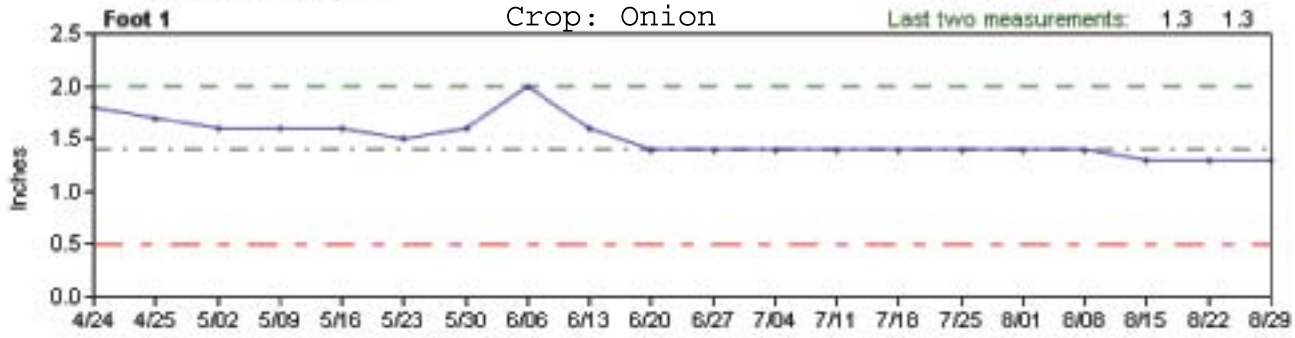
Soil Moisture Graphs

Field ID: 29
Crop: Onion

Year: **2007**

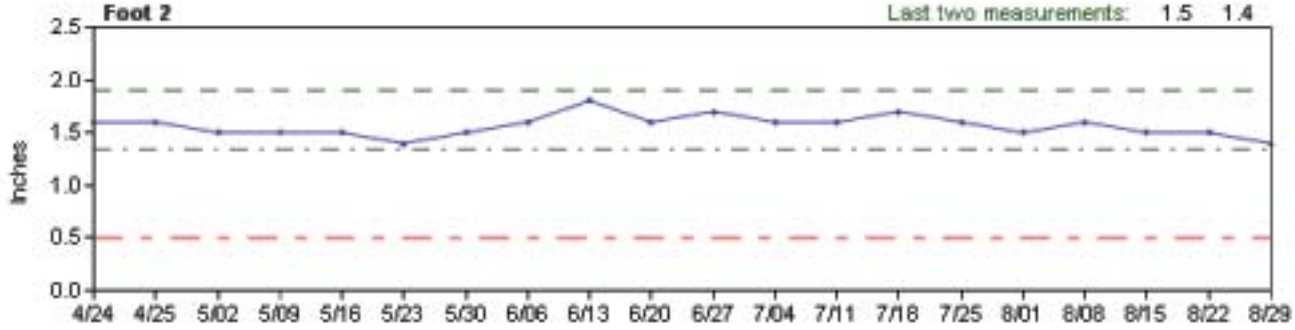
Foot 1

Last two measurements: 1.3 1.3



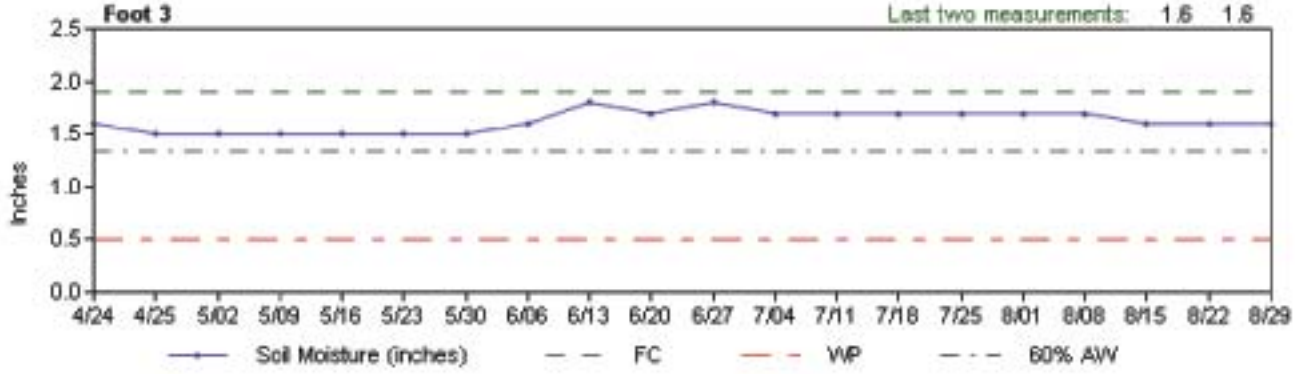
Foot 2

Last two measurements: 1.5 1.4



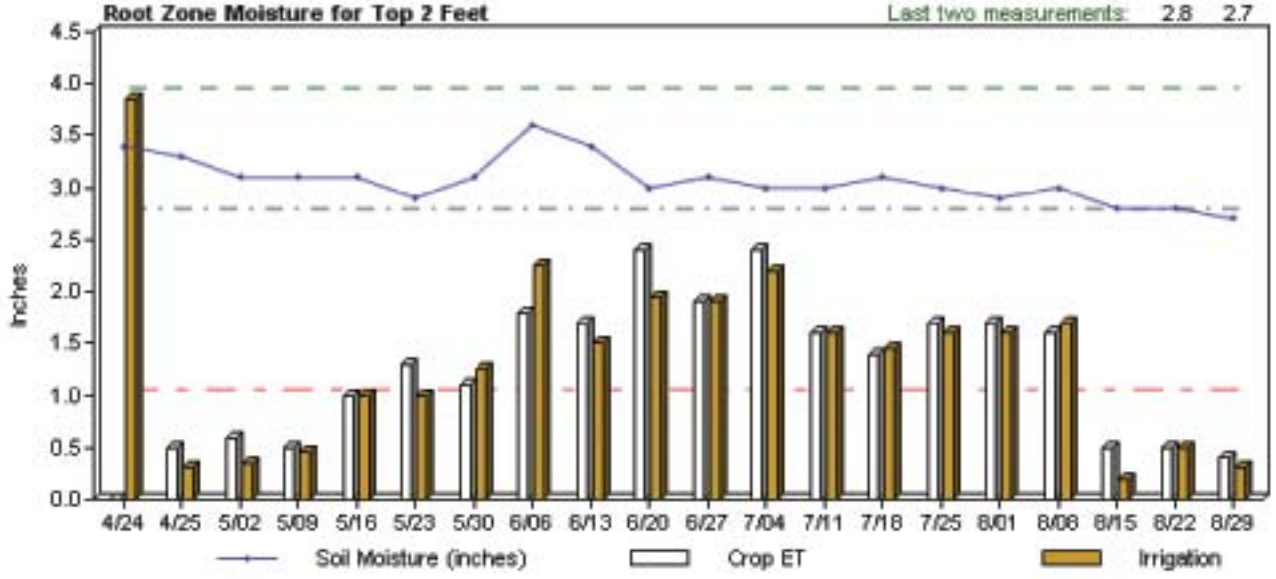
Foot 3

Last two measurements: 1.6 1.6



Root Zone Moisture for Top 2 Feet

Last two measurements: 2.8 2.7



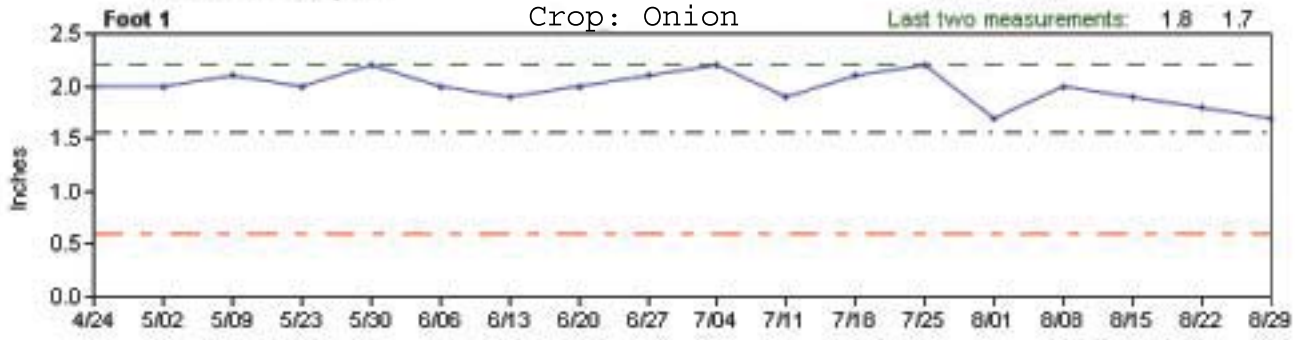
IRZ Consulting, LLC

Field ID: 30
Crop: Onion

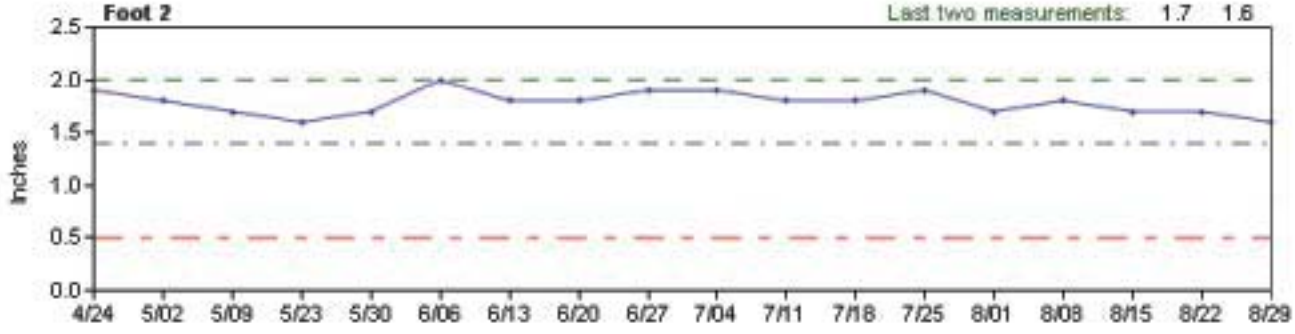
Soil Moisture Graphs

Year: **2007**

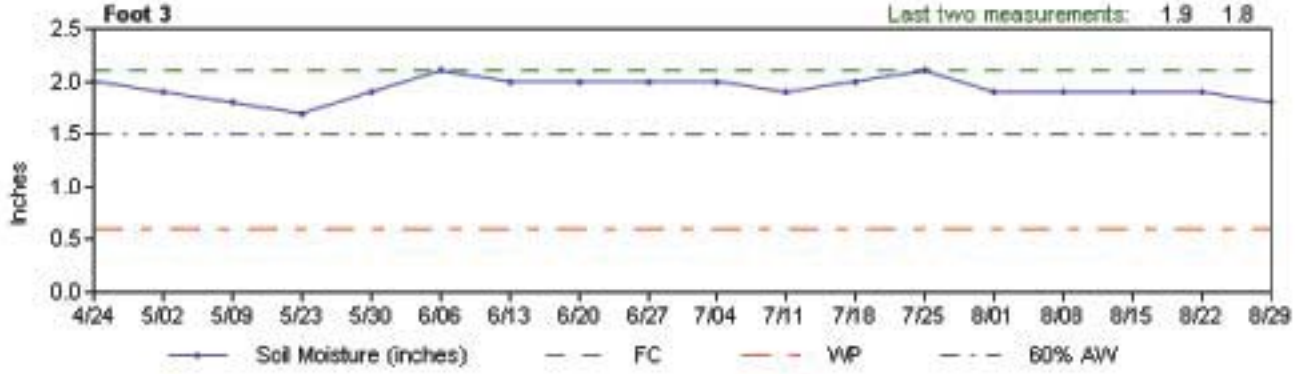
Foot 1 — Last two measurements: 1.8 1.7



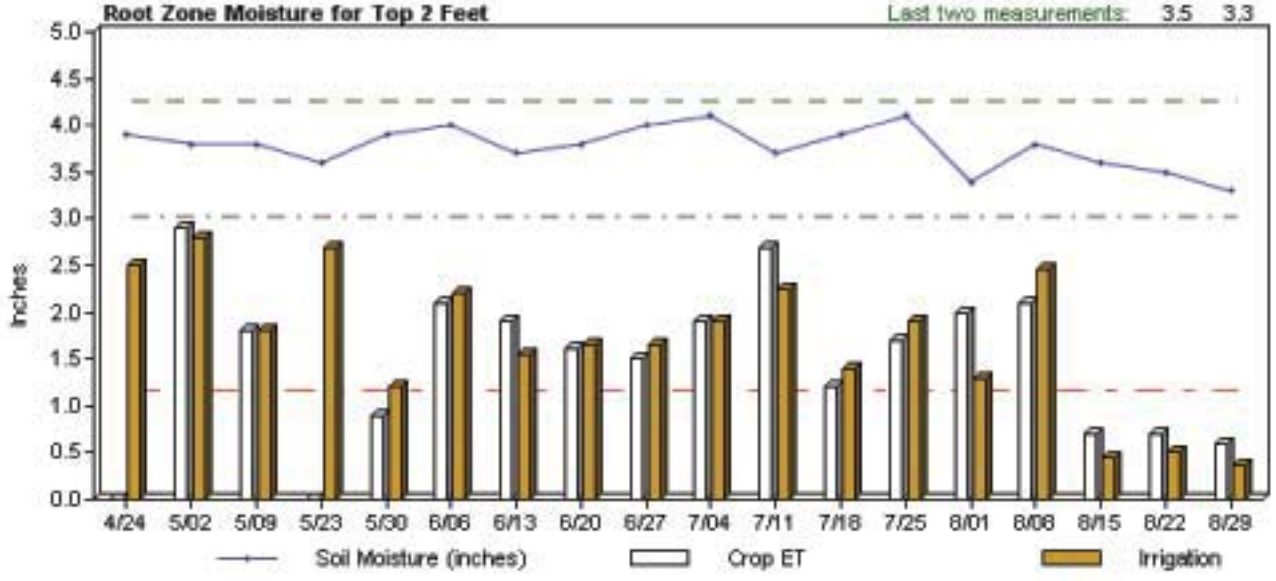
Foot 2 — Last two measurements: 1.7 1.6



Foot 3 — Last two measurements: 1.9 1.8



Root Zone Moisture for Top 2 Feet — Last two measurements: 3.5 3.3

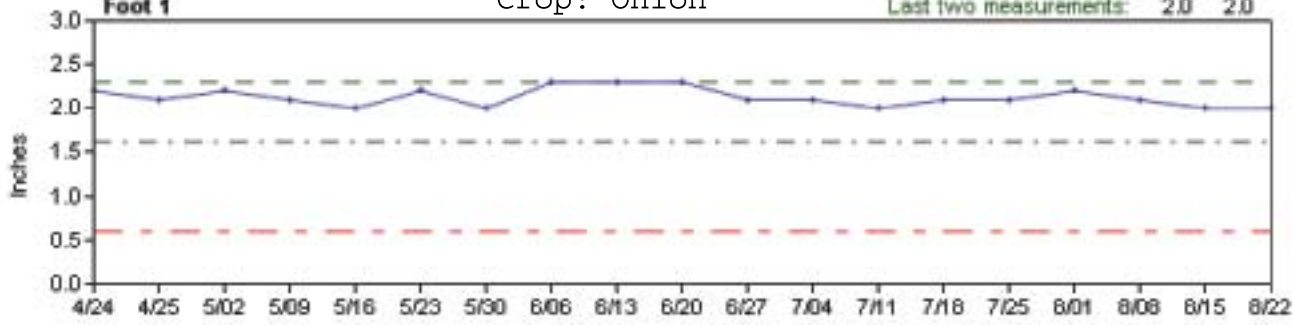


IRZ Consulting, LLC

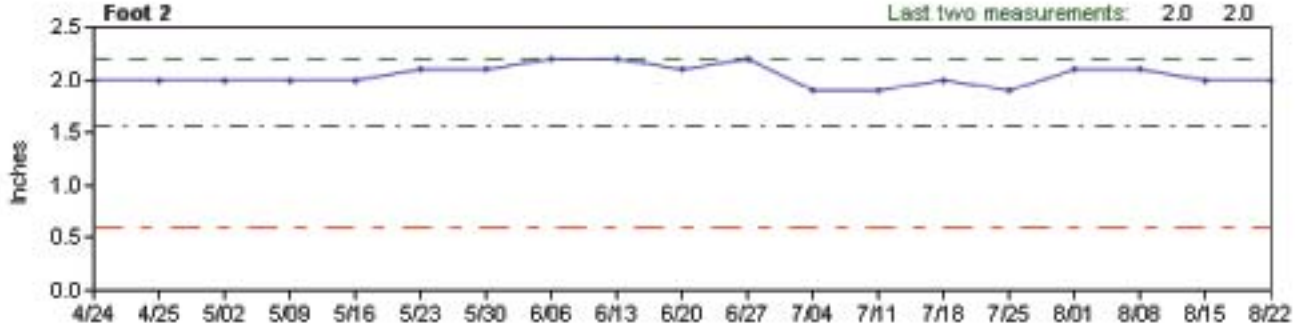
Field ID: 31
Crop: Onion

Soil Moisture Graphs Year: **2007**

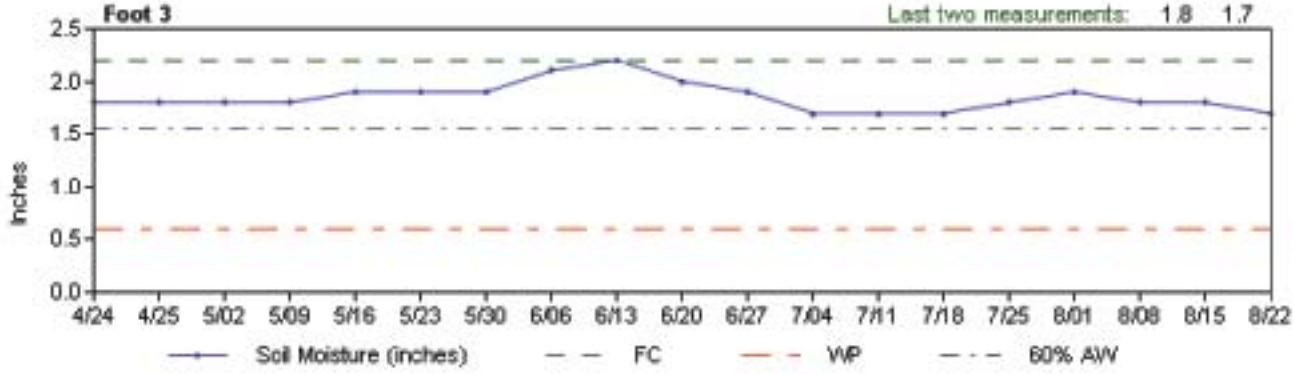
Foot 1 Last two measurements: 2.0 2.0



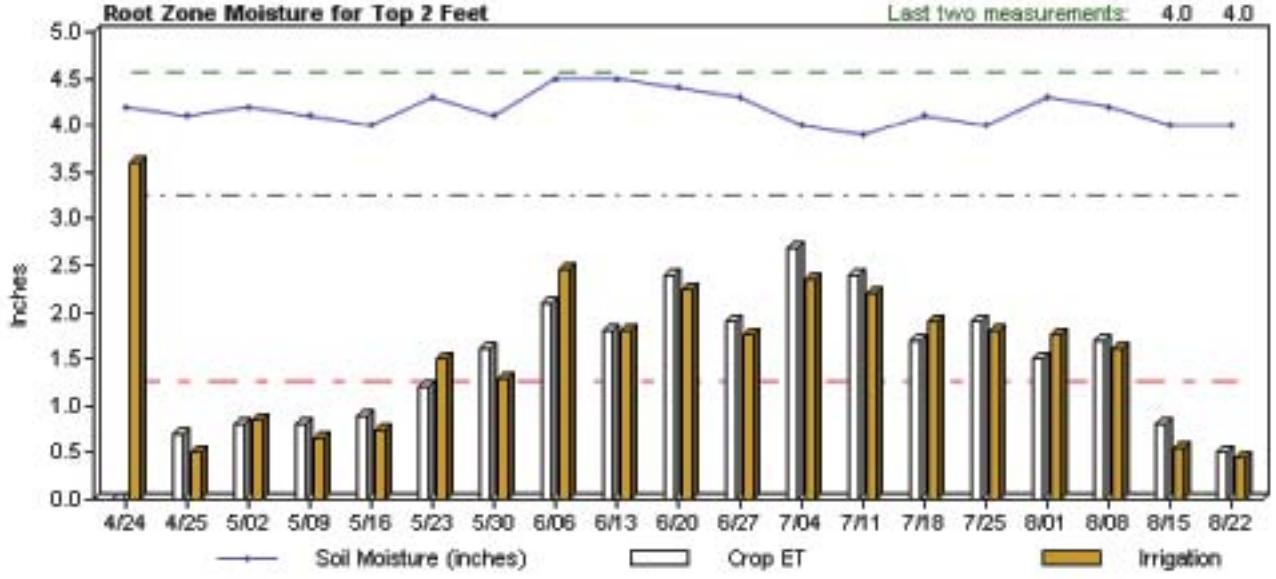
Foot 2 Last two measurements: 2.0 2.0



Foot 3 Last two measurements: 1.8 1.7



Root Zone Moisture for Top 2 Feet Last two measurements: 4.0 4.0

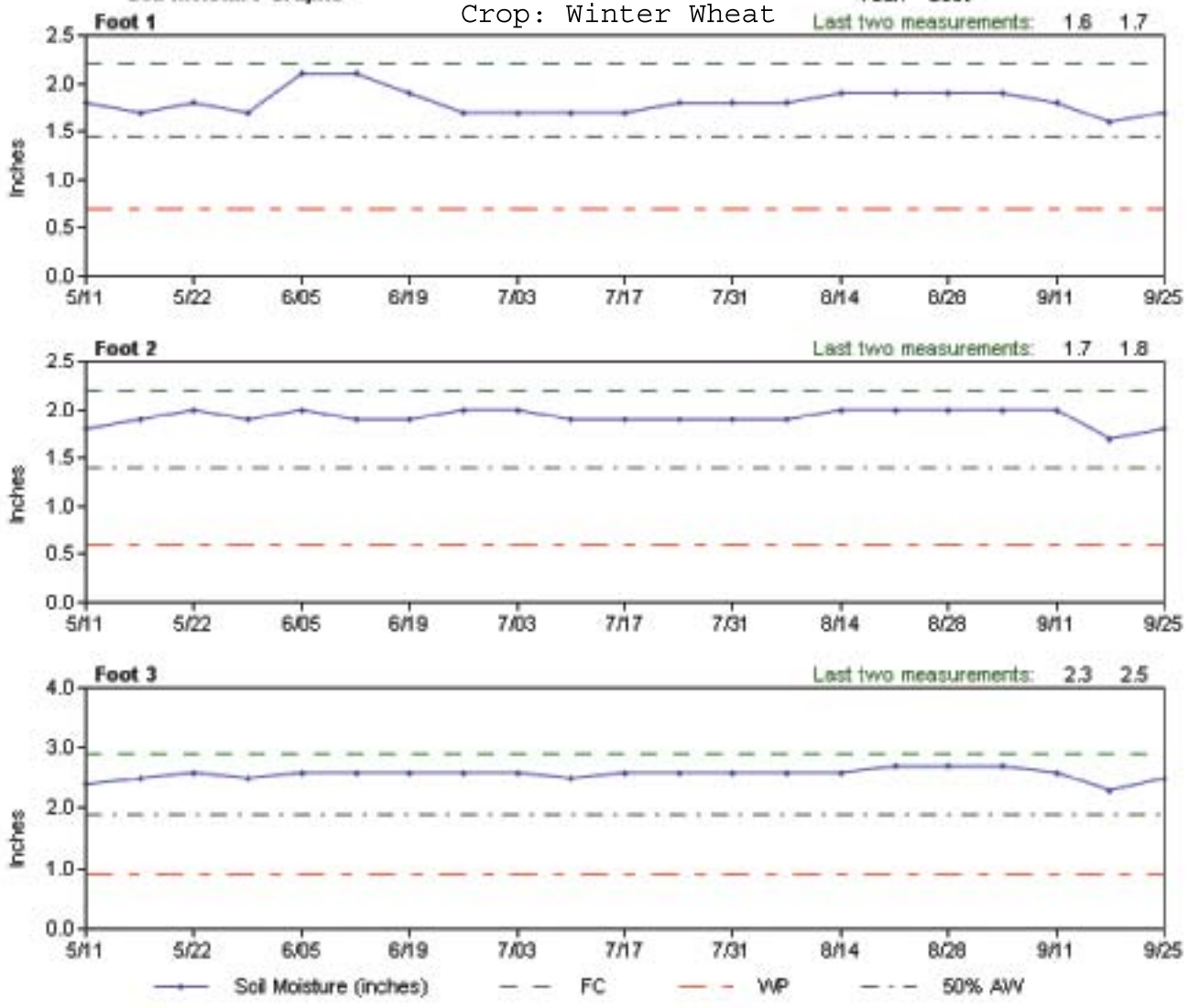


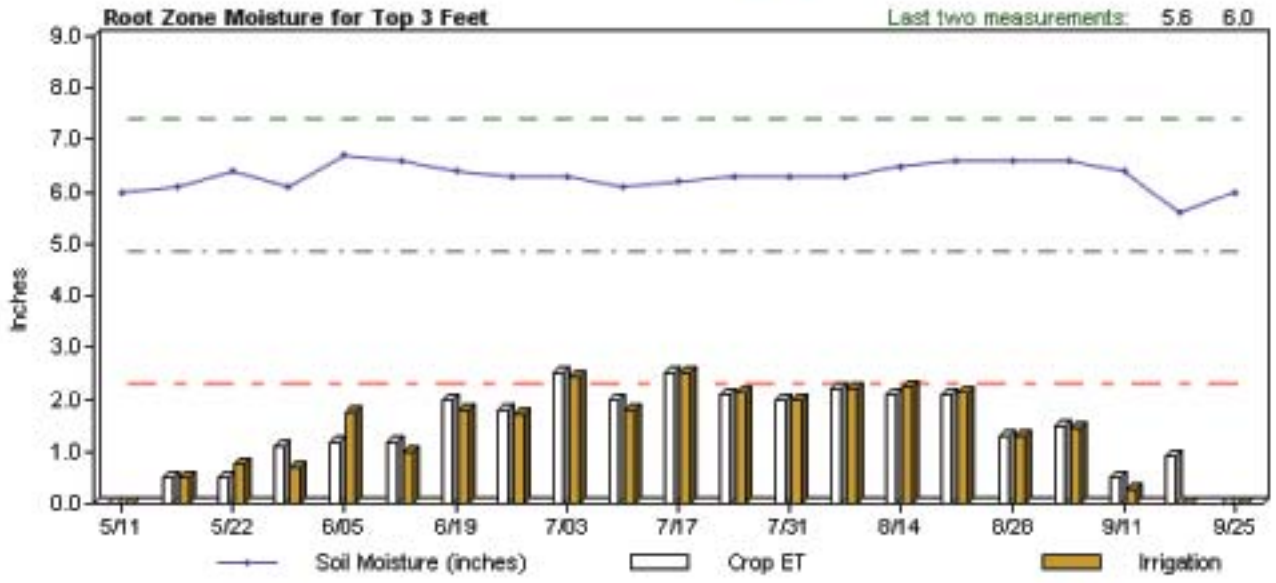
IRZ Consulting, LLC

Field ID: 32
Crop: Winter Wheat

Soil Moisture Graphs

Year: 2007



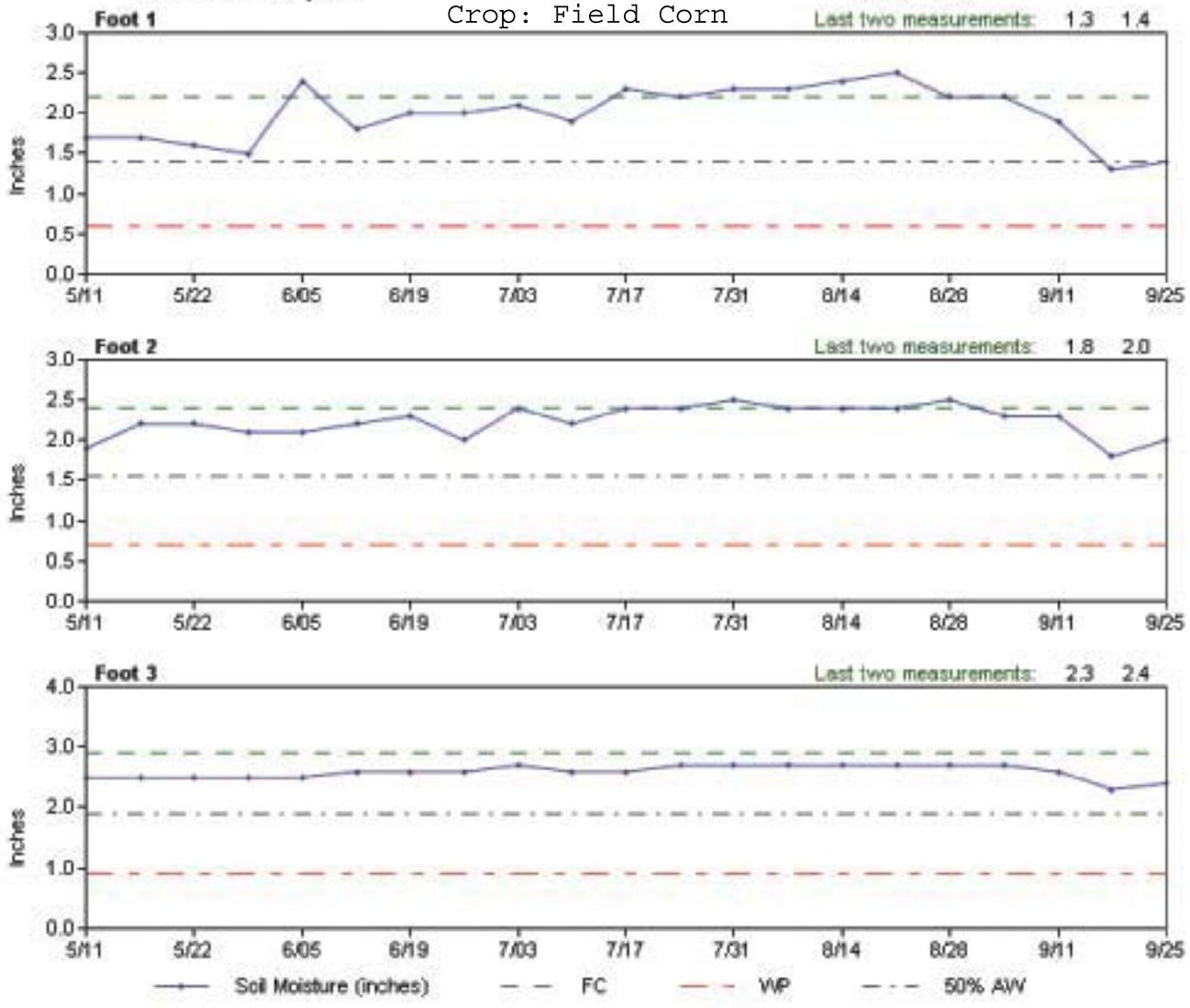


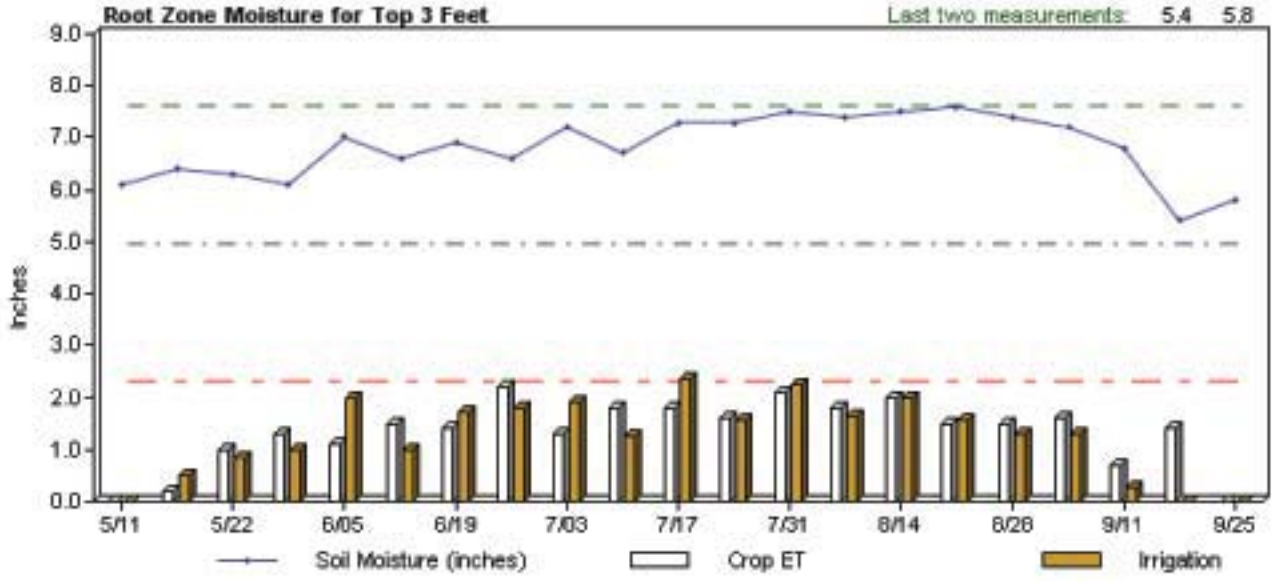
IRZ Consulting, LLC

Field ID: 33
Crop: Field Corn

Soil Moisture Graphs

Year: 2007





IRZ Consulting, LLC

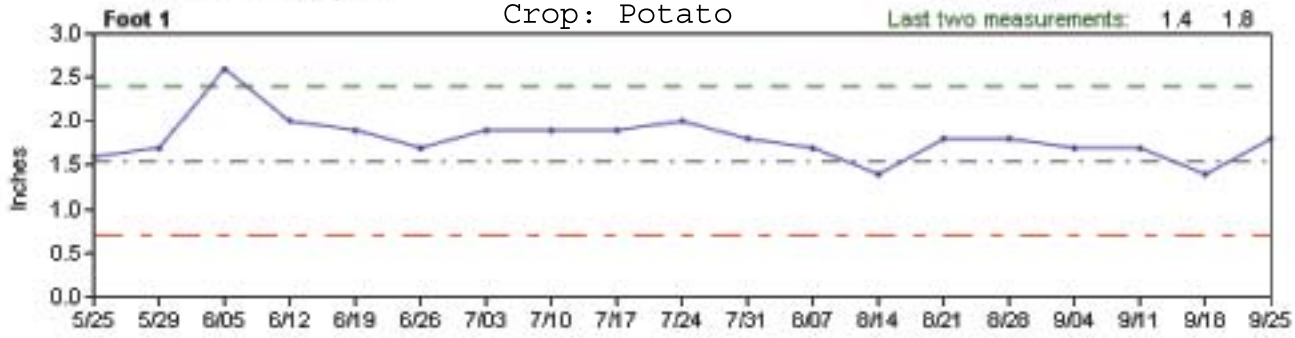
Field ID: 34
Crop: Potato

Soil Moisture Graphs

Year: **2007**

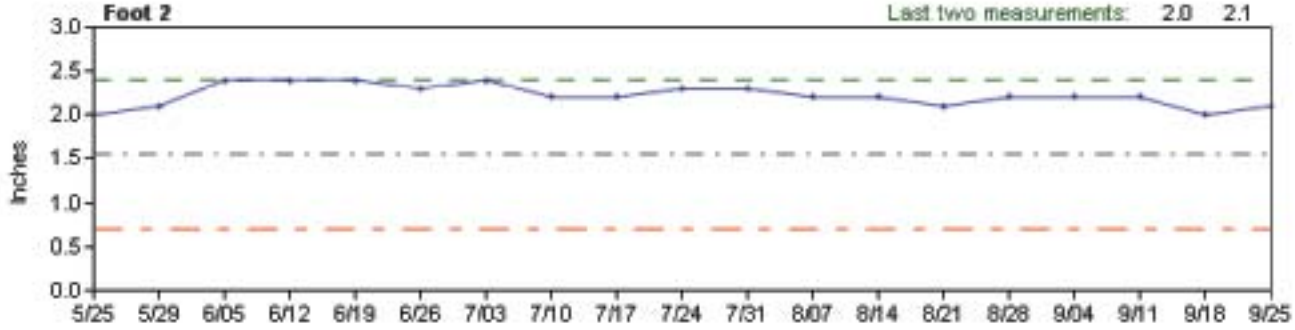
Foot 1

Last two measurements: 1.4 1.8



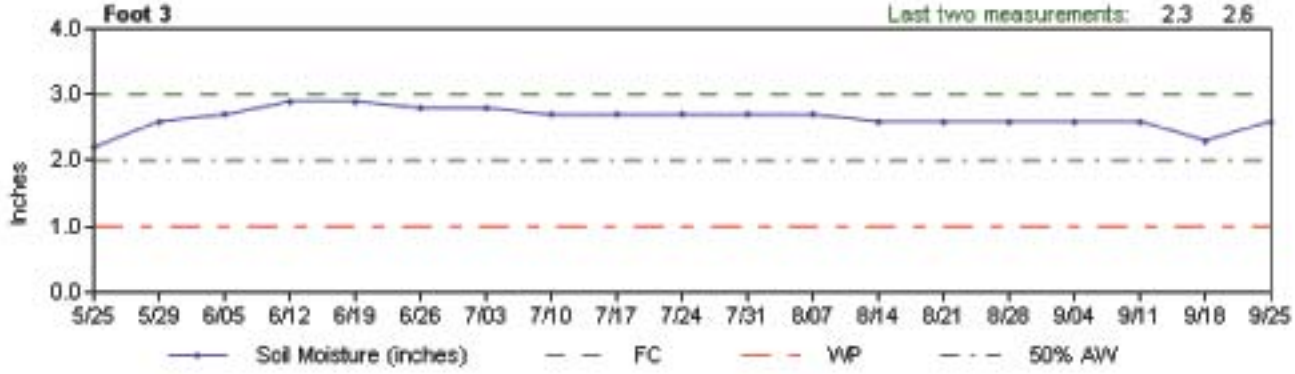
Foot 2

Last two measurements: 2.0 2.1



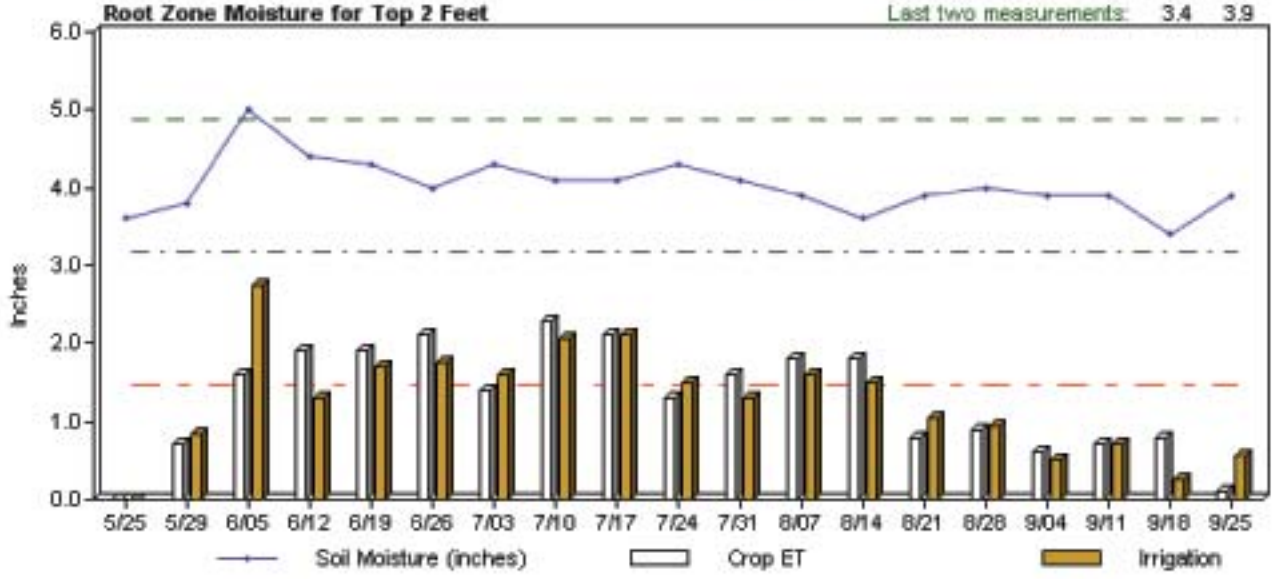
Foot 3

Last two measurements: 2.3 2.6



Root Zone Moisture for Top 2 Feet

Last two measurements: 3.4 3.9



IRZ Consulting, LLC

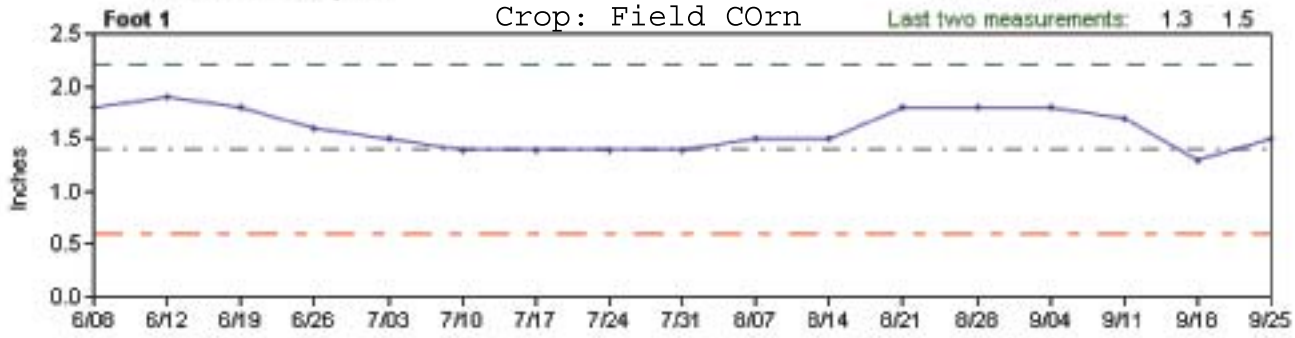
Soil Moisture Graphs

Field ID: 35
Crop: Field COrn

Year: 2007

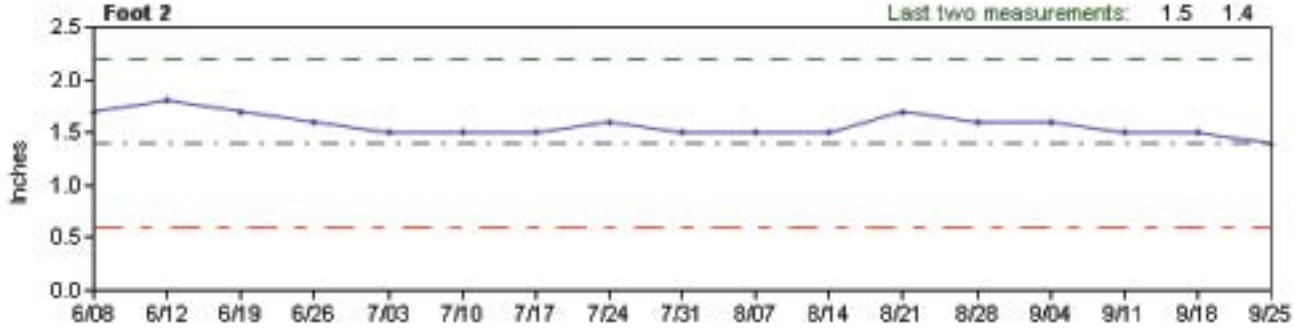
Foot 1

Last two measurements: 1.3 1.5



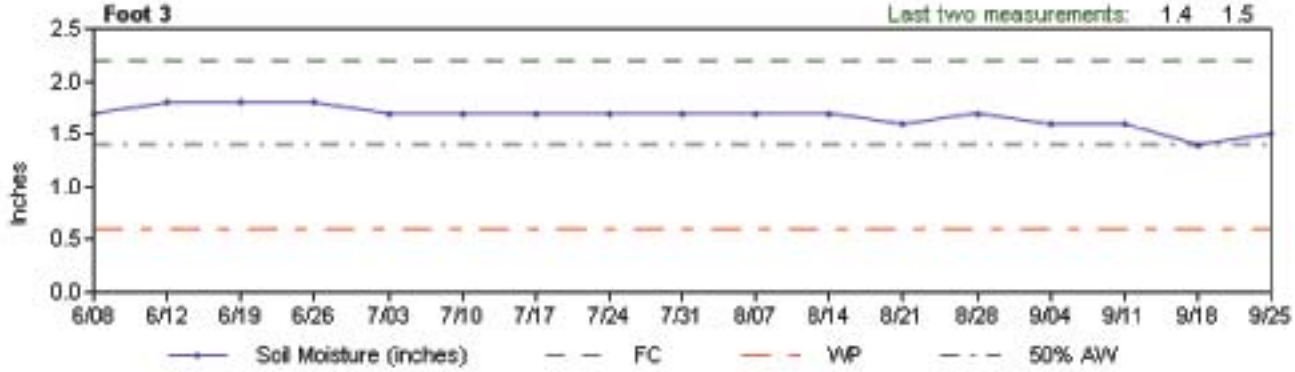
Foot 2

Last two measurements: 1.5 1.4



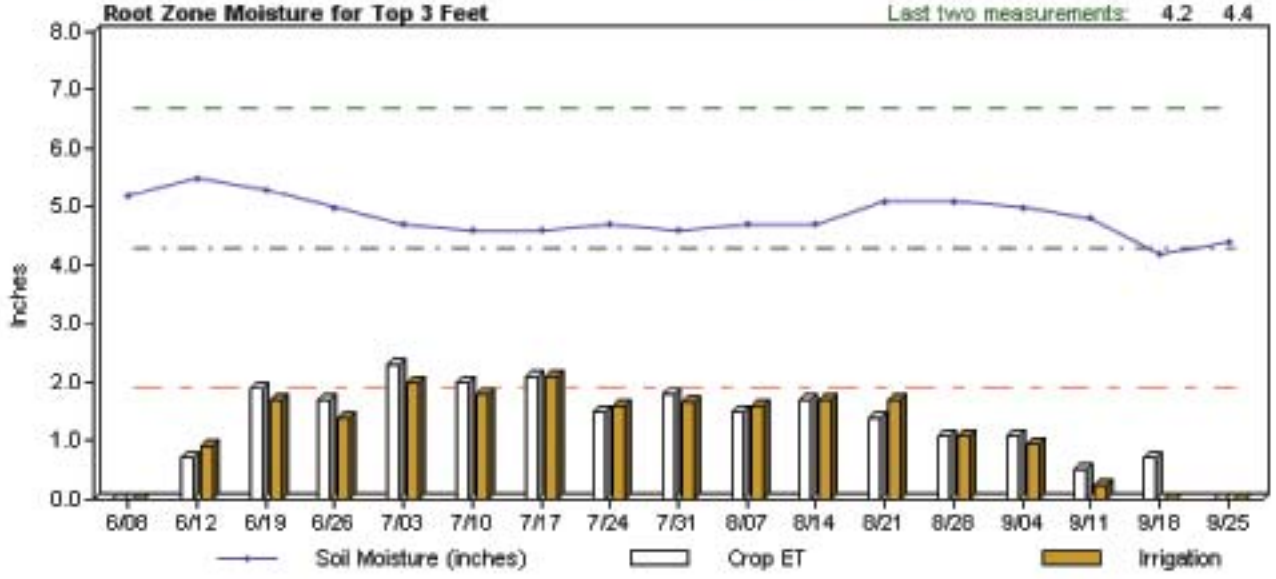
Foot 3

Last two measurements: 1.4 1.5



Root Zone Moisture for Top 3 Feet

Last two measurements: 4.2 4.4



IRZ Consulting, LLC

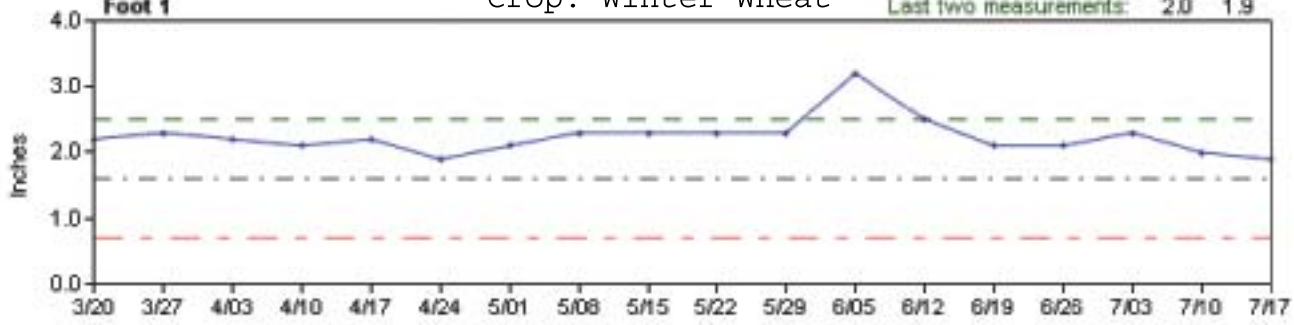
Field ID: 36
Crop: Winter Wheat

Soil Moisture Graphs

Year: 2007

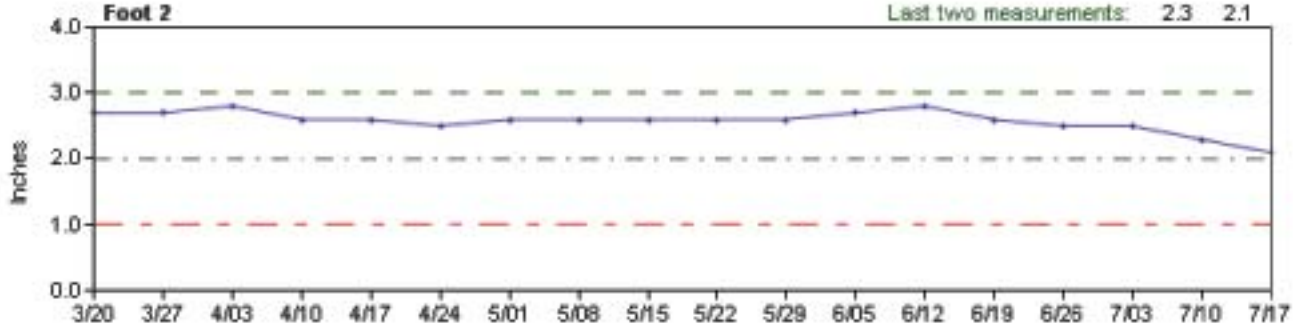
Foot 1

Last two measurements: 2.0 1.9



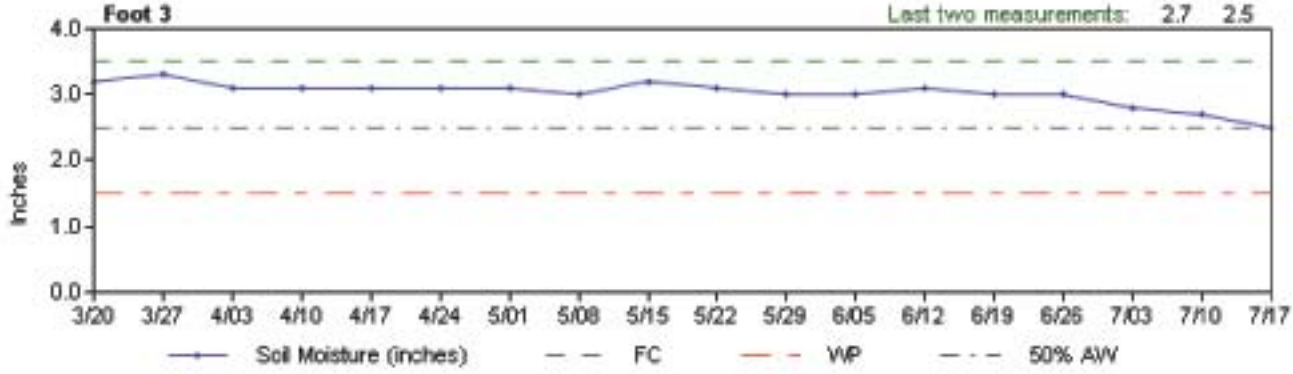
Foot 2

Last two measurements: 2.3 2.1



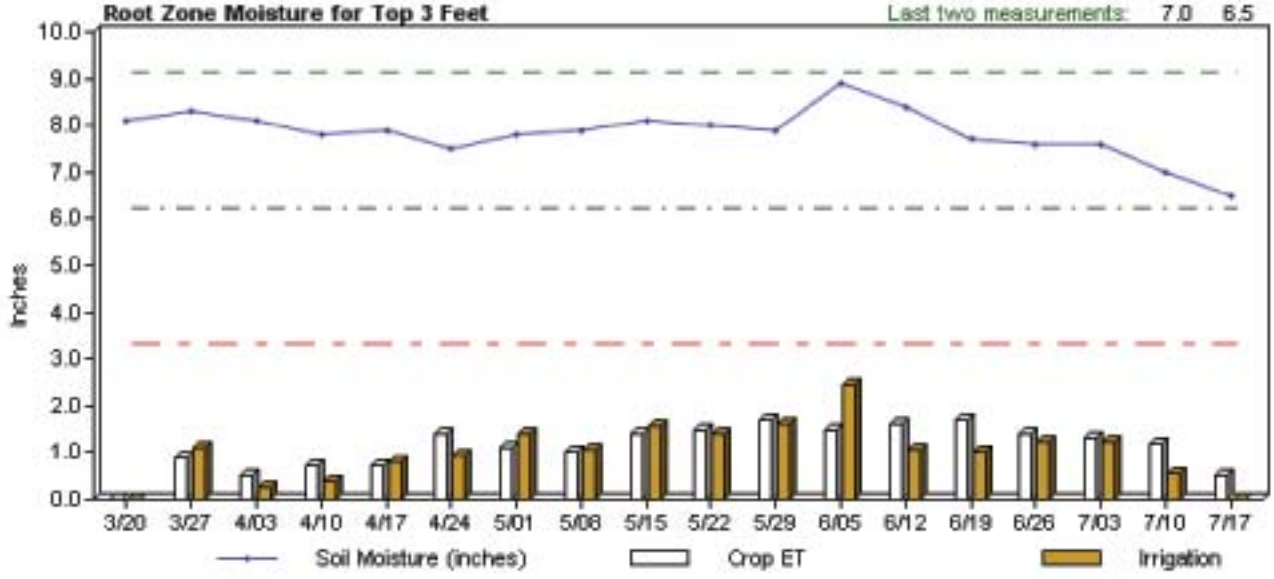
Foot 3

Last two measurements: 2.7 2.5



Root Zone Moisture for Top 3 Feet

Last two measurements: 7.0 6.5



IRZ Consulting, LLC

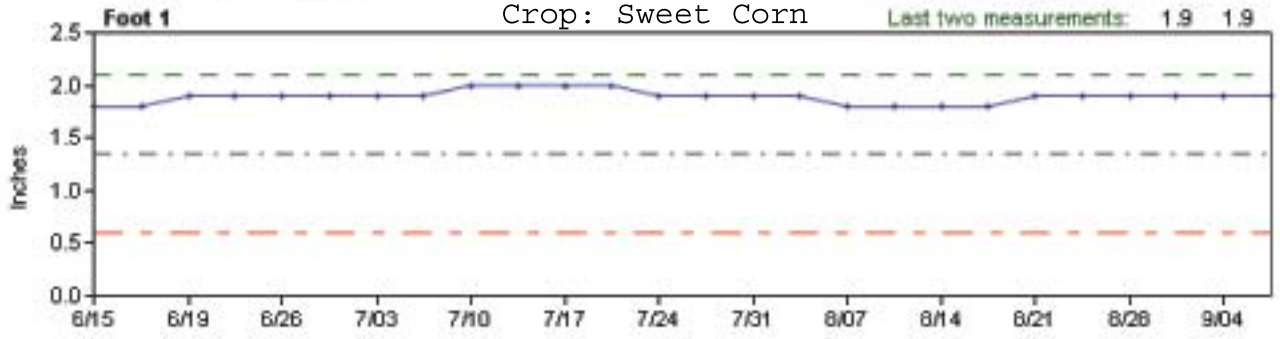
Soil Moisture Graphs

Field ID: 37
Crop: Sweet Corn

Year: **2007**

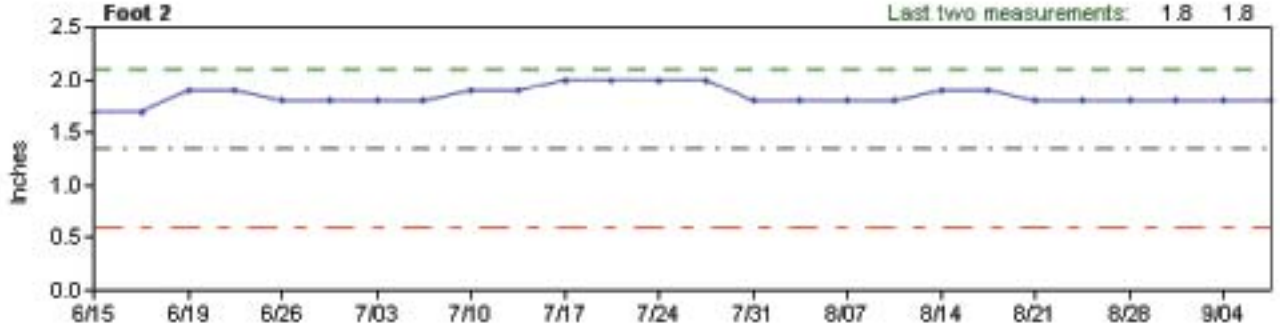
Foot 1

Last two measurements: 1.9 1.9



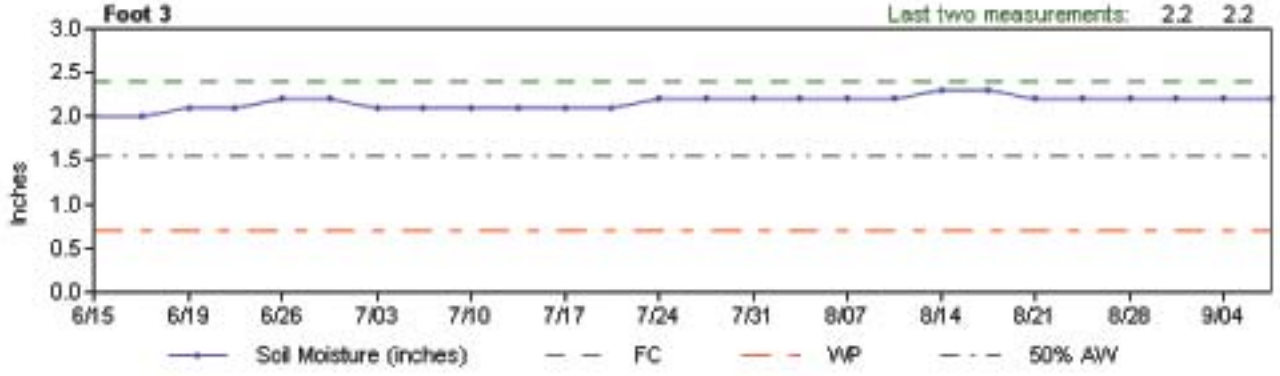
Foot 2

Last two measurements: 1.8 1.8



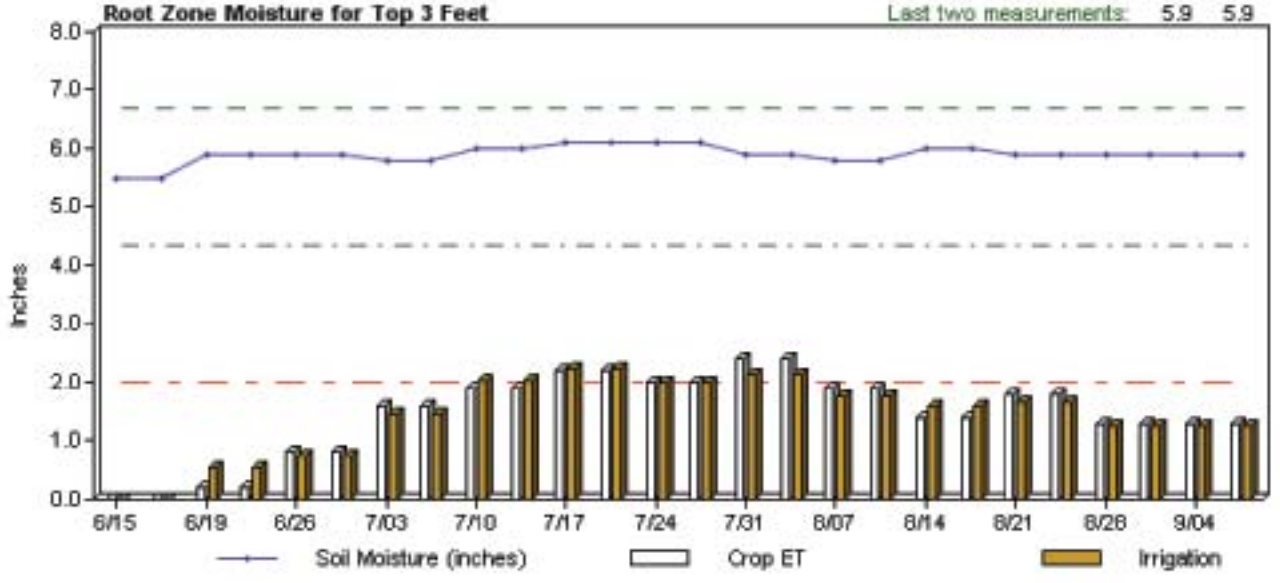
Foot 3

Last two measurements: 2.2 2.2



Root Zone Moisture for Top 3 Feet

Last two measurements: 5.9 5.9

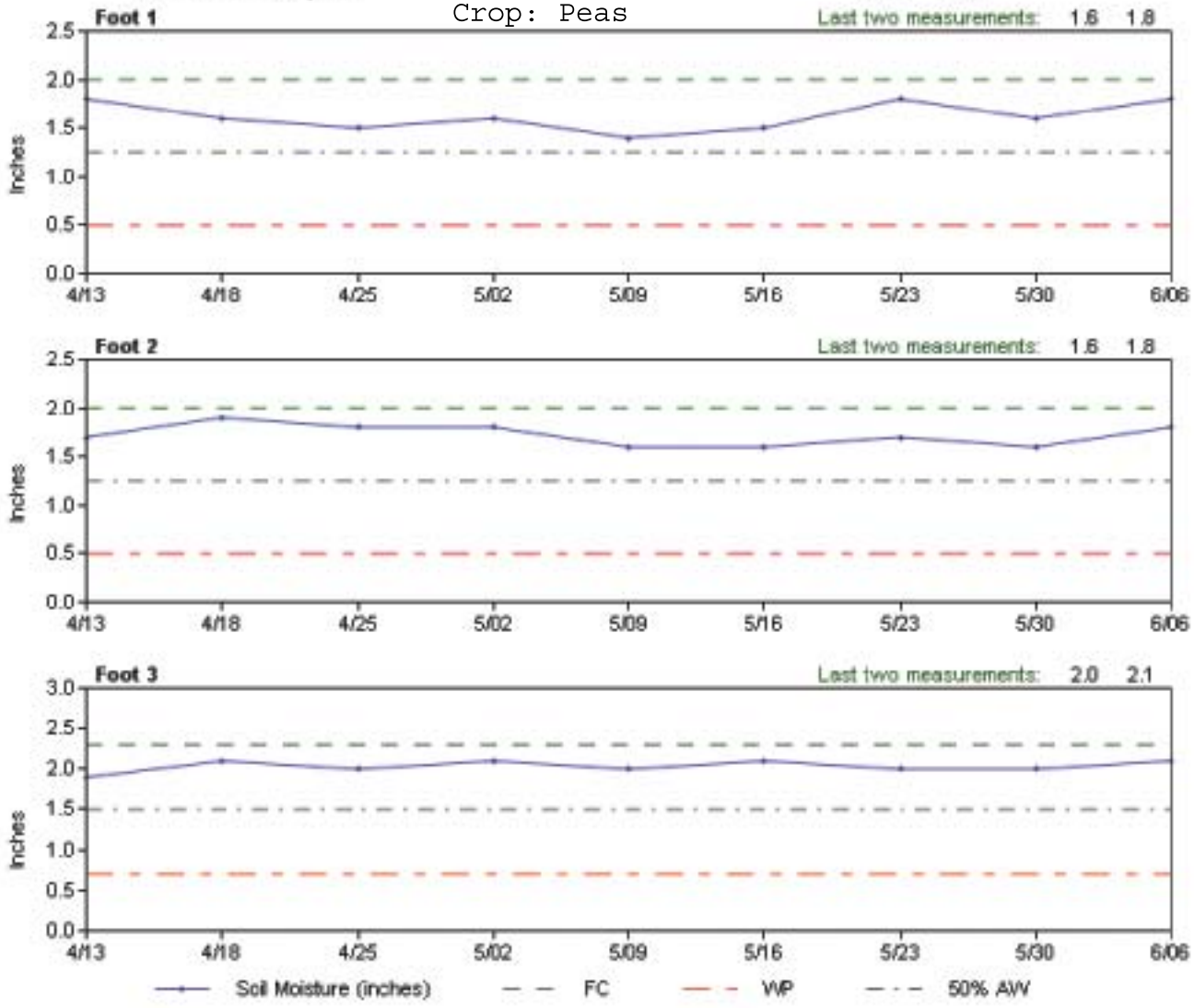


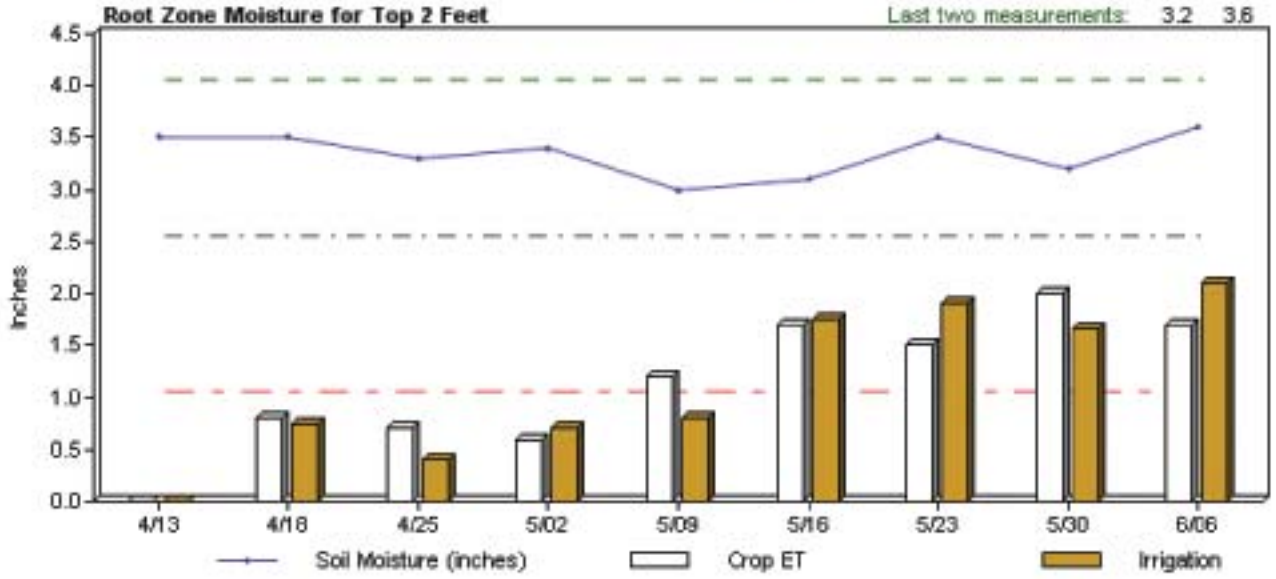
IRZ Consulting, LLC

Field ID: 38
Crop: Peas

Soil Moisture Graphs

Year: 2007



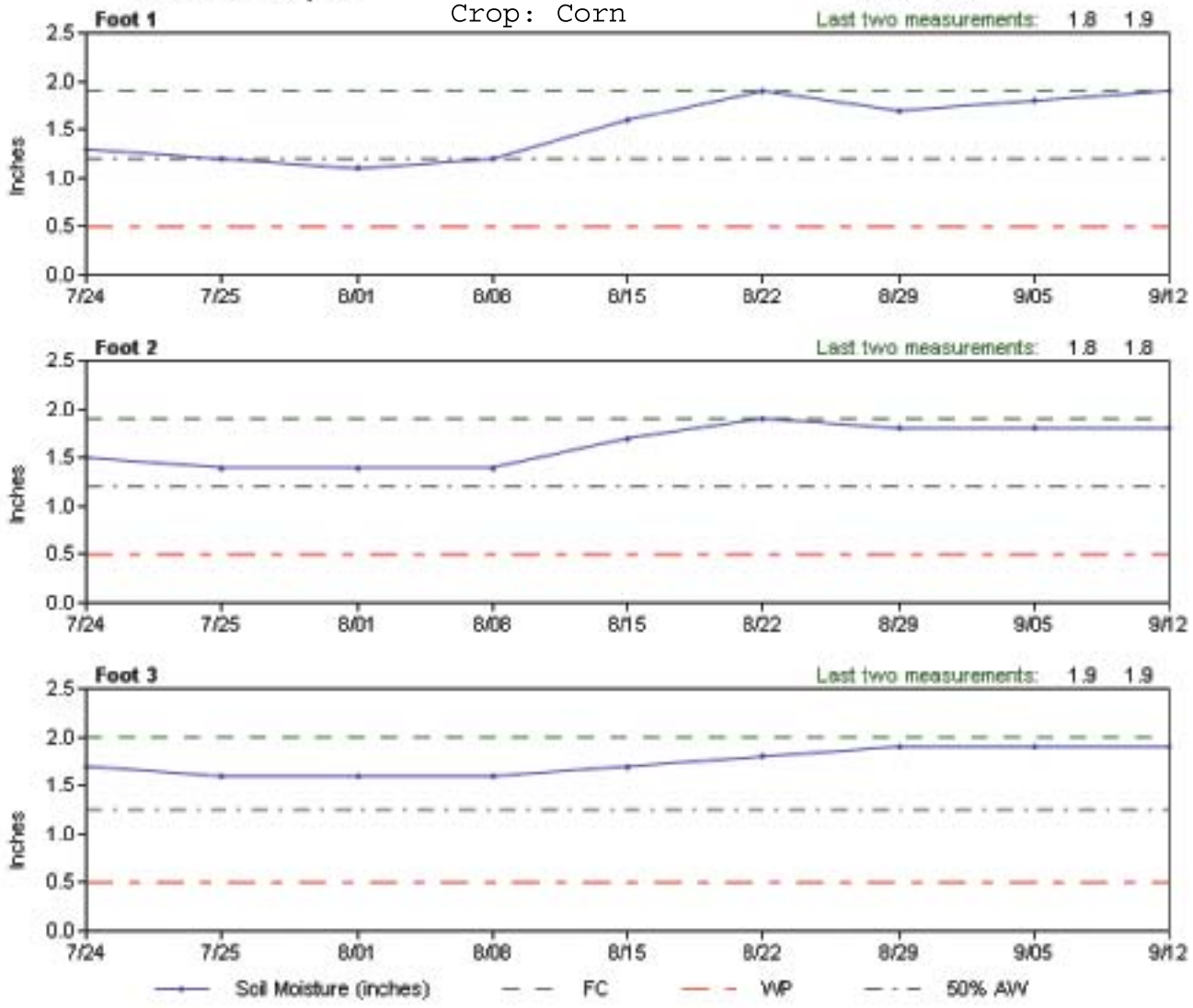


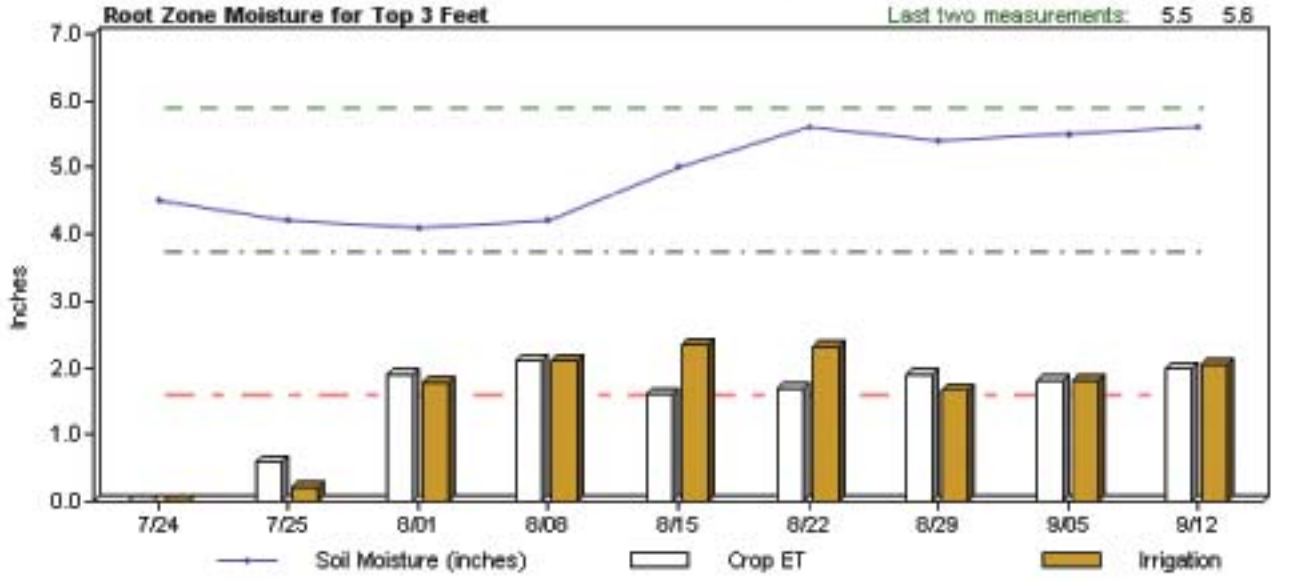
IRZ Consulting, LLC

Field ID: 38
Crop: Corn

Soil Moisture Graphs

Year: 2007



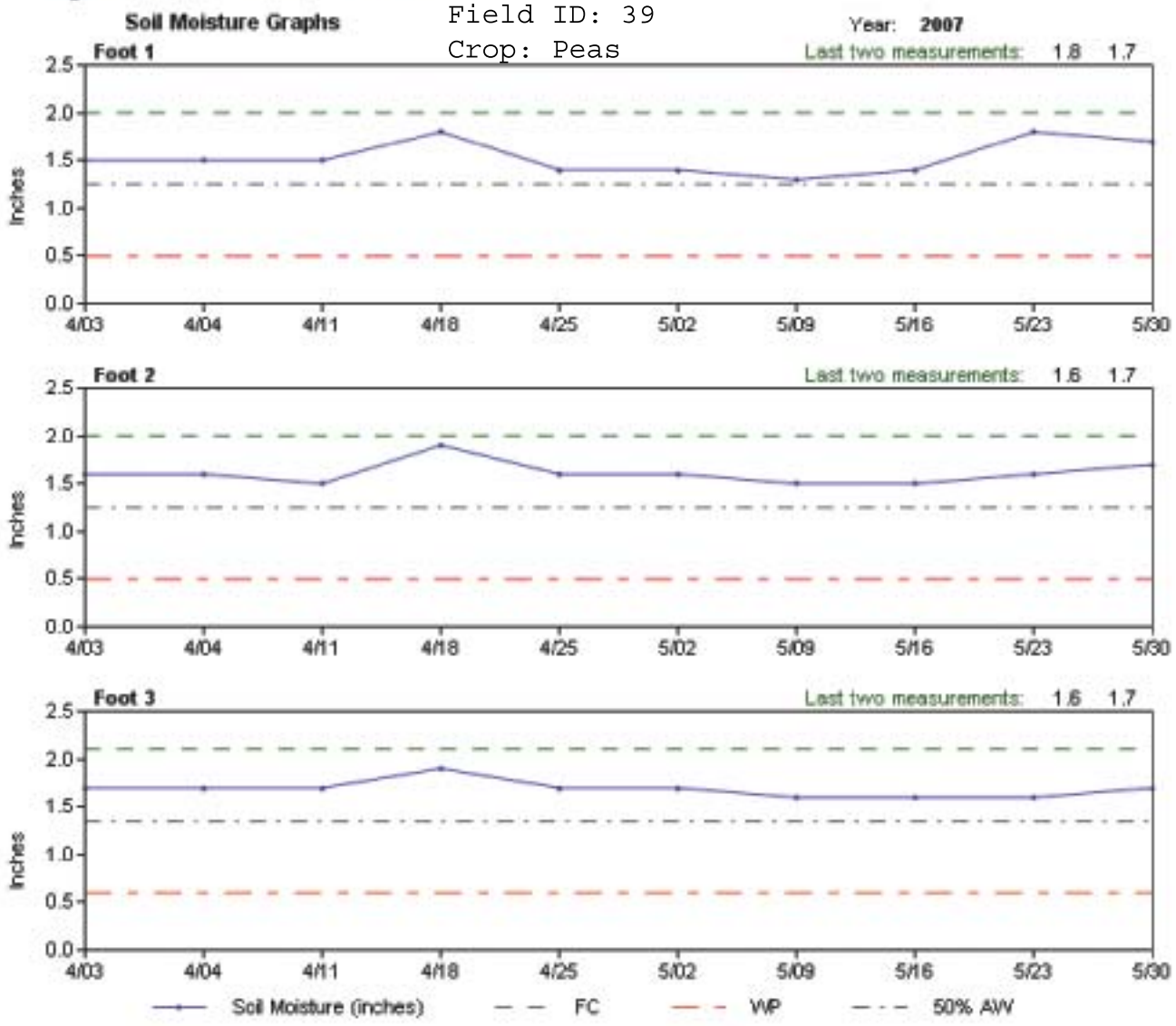


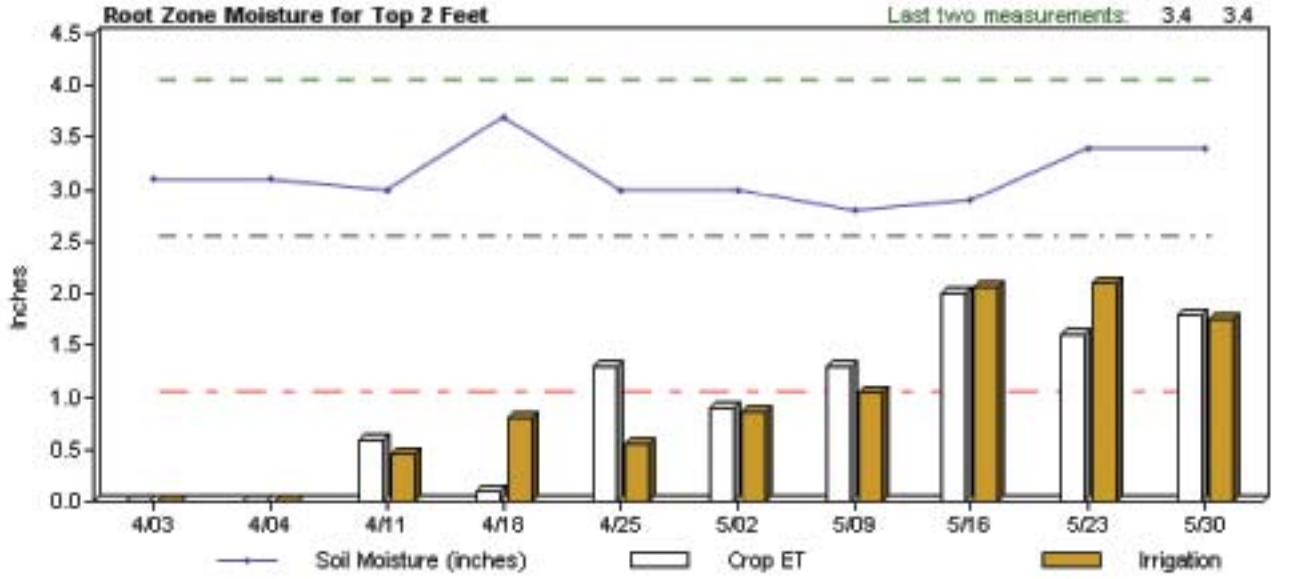
IRZ Consulting, LLC

Soil Moisture Graphs

Field ID: 39
Crop: Peas

Year: 2007





IRZ Consulting, LLC

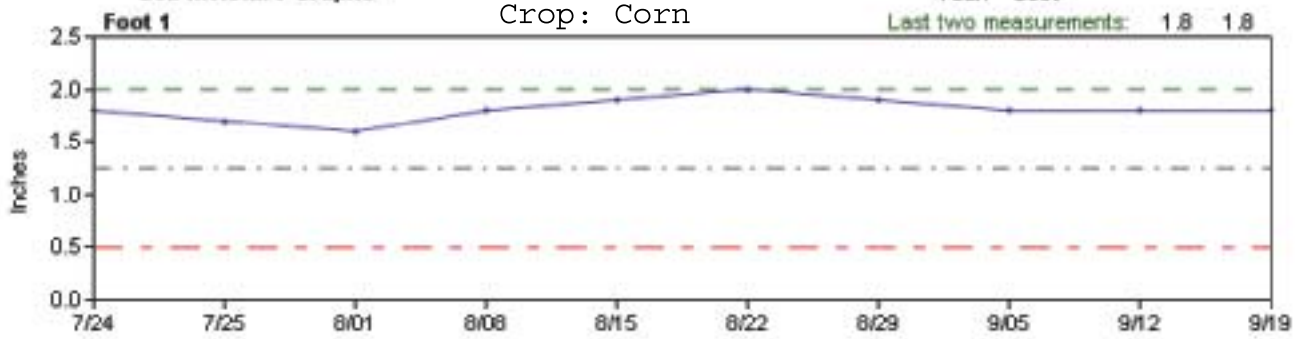
Field ID: 39
Crop: Corn

Soil Moisture Graphs

Year: 2007

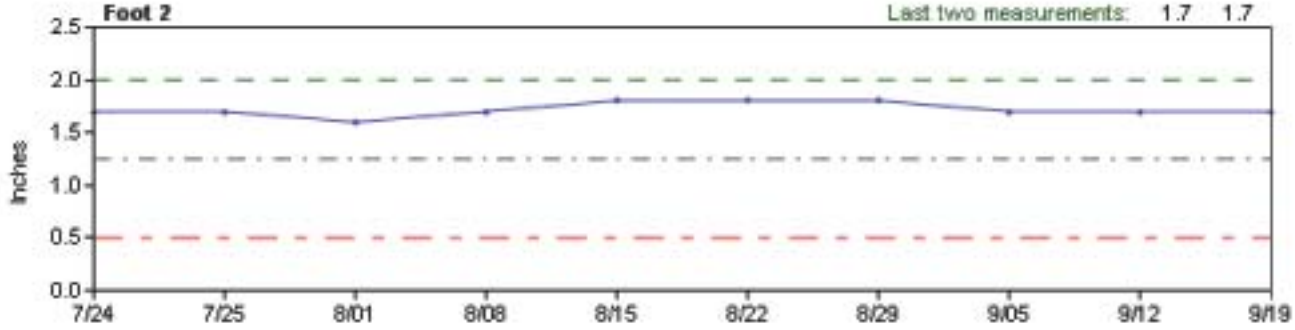
Foot 1

Last two measurements: 1.8 1.8



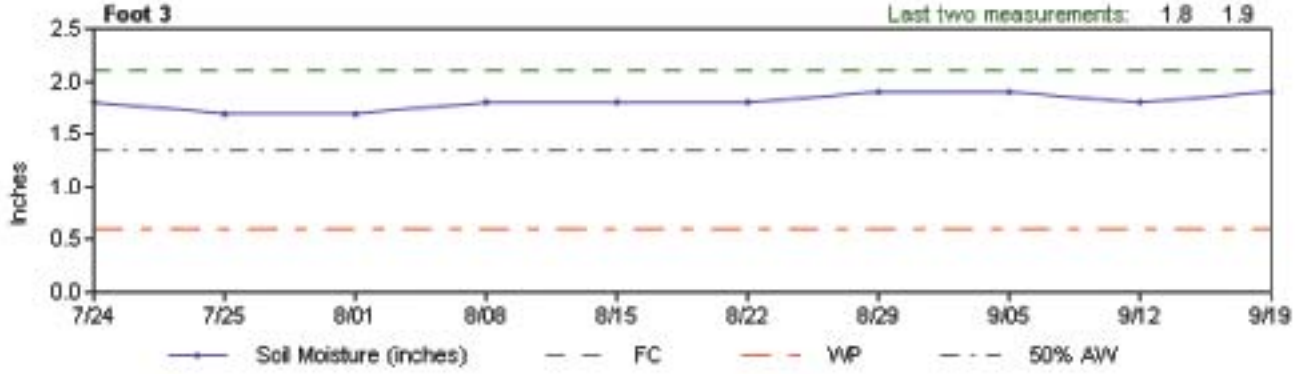
Foot 2

Last two measurements: 1.7 1.7



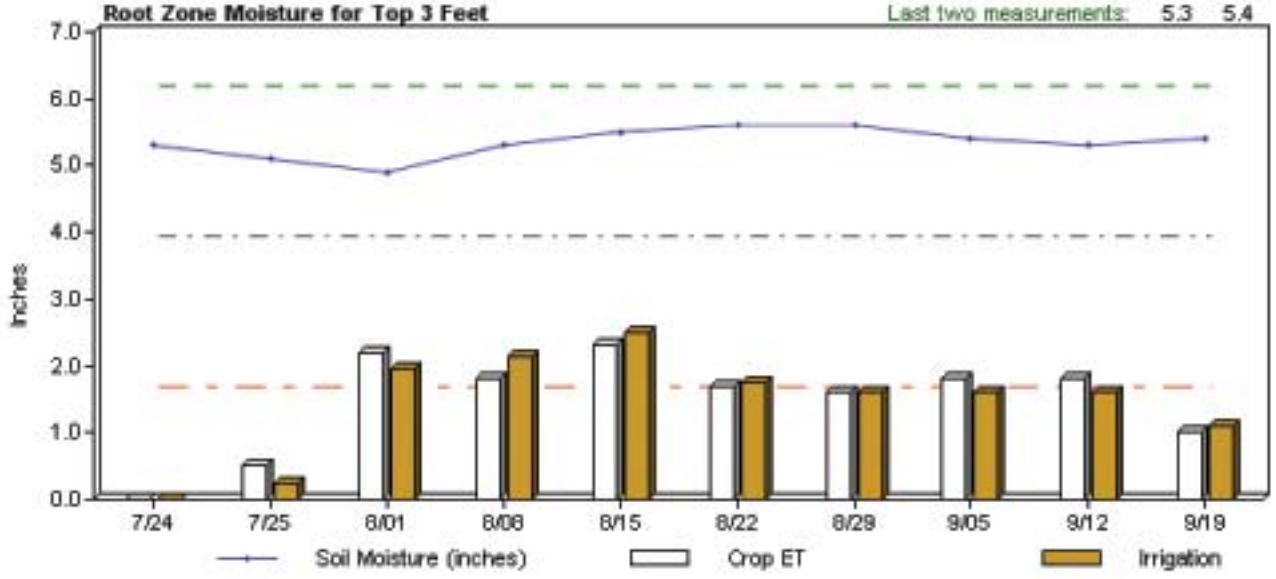
Foot 3

Last two measurements: 1.8 1.9



Root Zone Moisture for Top 3 Feet

Last two measurements: 5.3 5.4



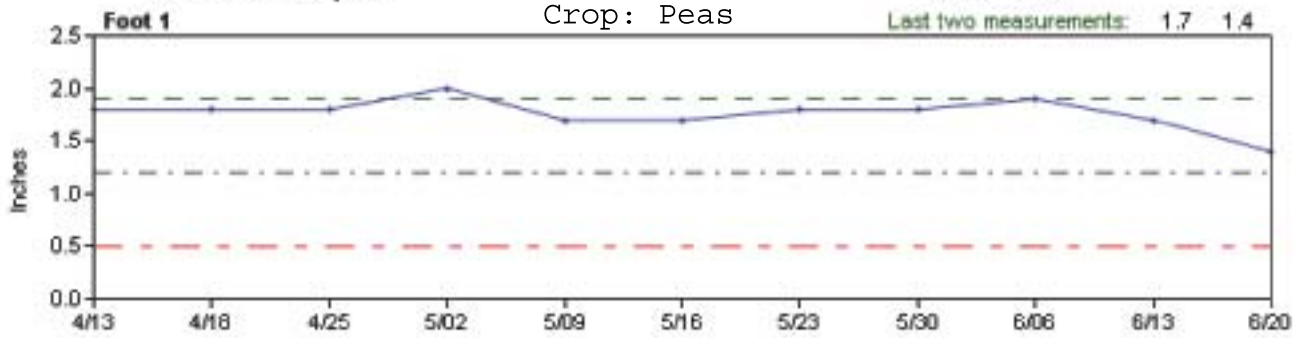
IRZ Consulting, LLC

Soil Moisture Graphs

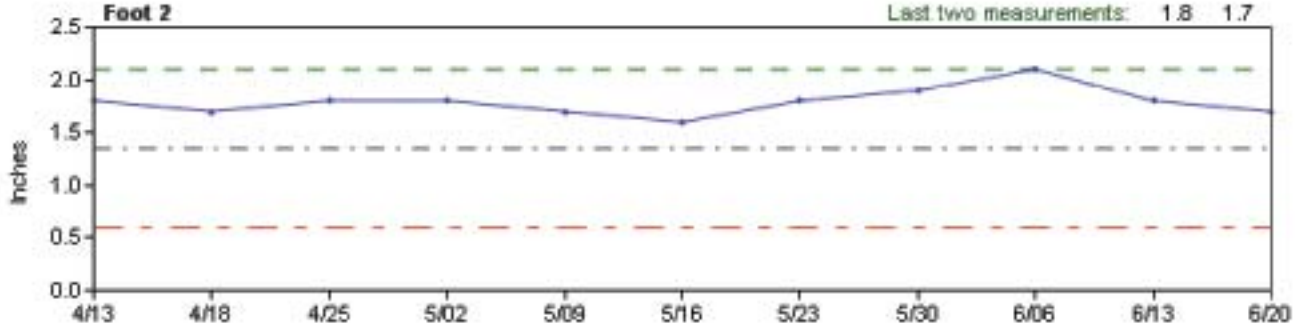
Field ID: 40
Crop: Peas

Year: **2007**

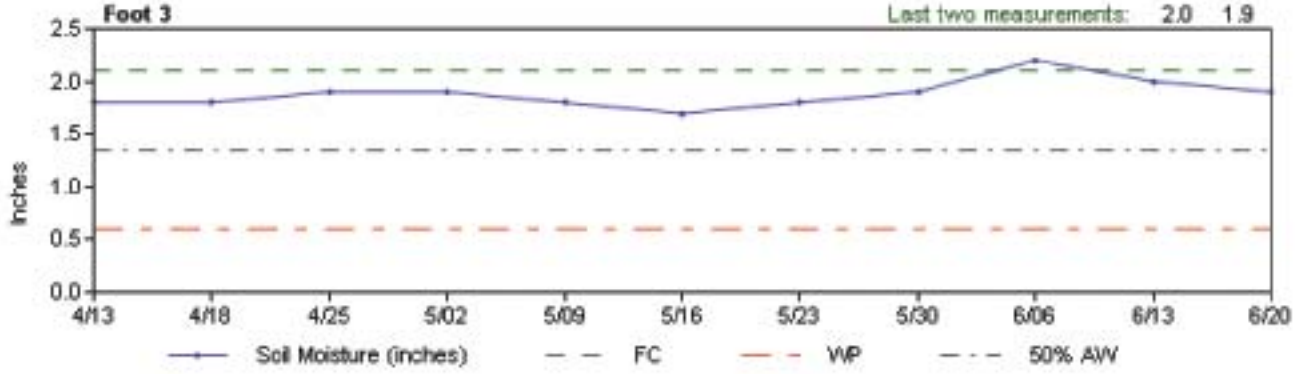
Foot 1 — Last two measurements: 1.7 1.4



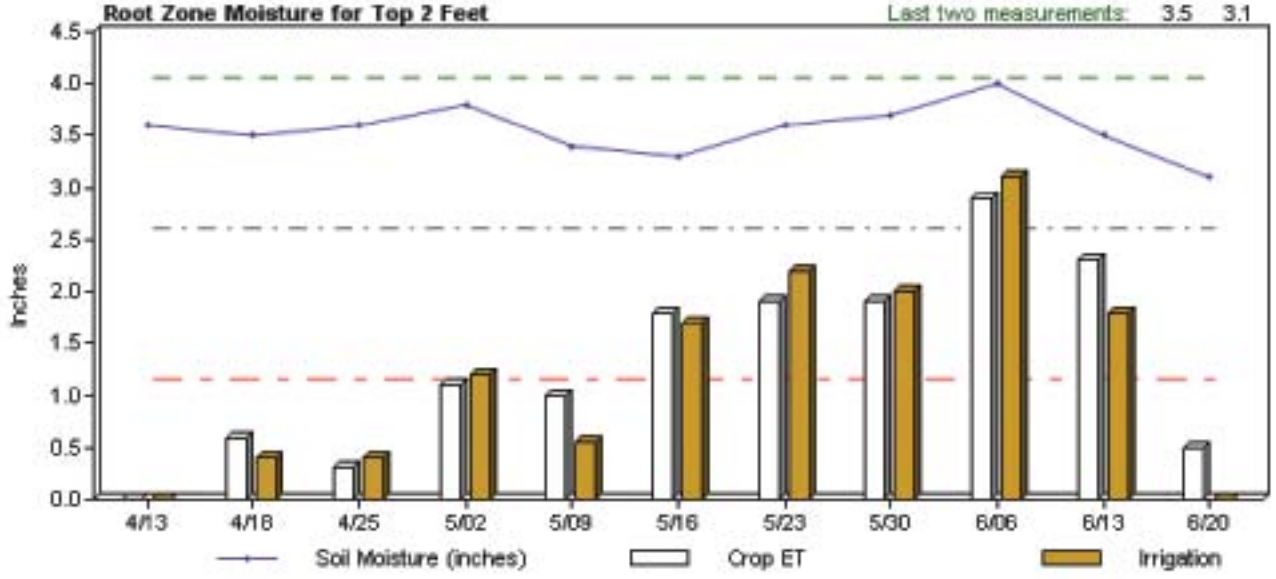
Foot 2 — Last two measurements: 1.8 1.7



Foot 3 — Last two measurements: 2.0 1.9



Root Zone Moisture for Top 2 Feet — Last two measurements: 3.5 3.1

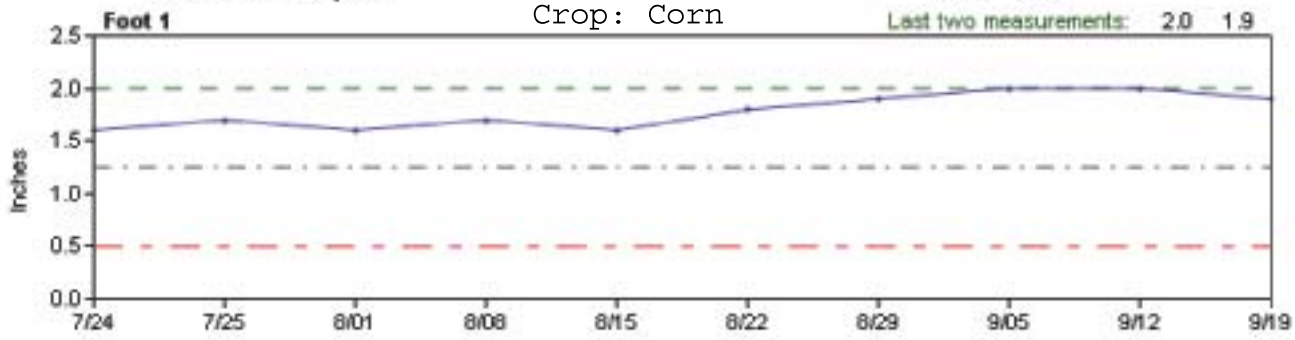


IRZ Consulting, LLC

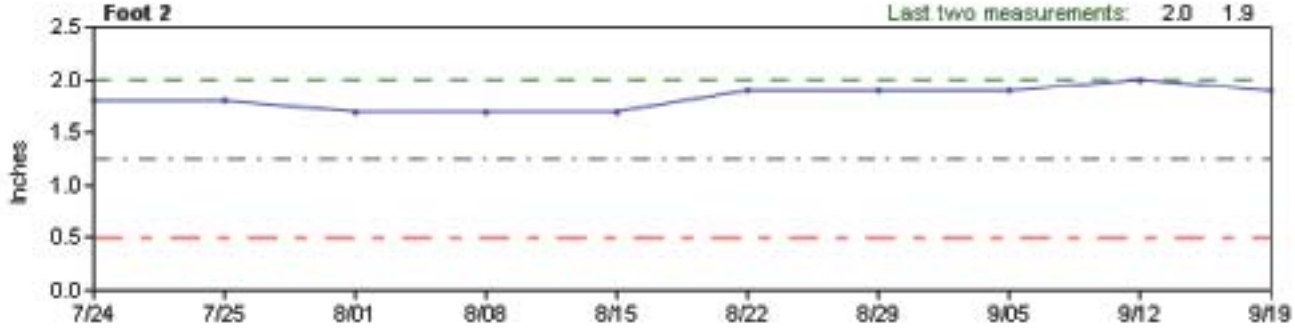
Field ID: 40
Crop: Corn

Soil Moisture Graphs Year: **2007**

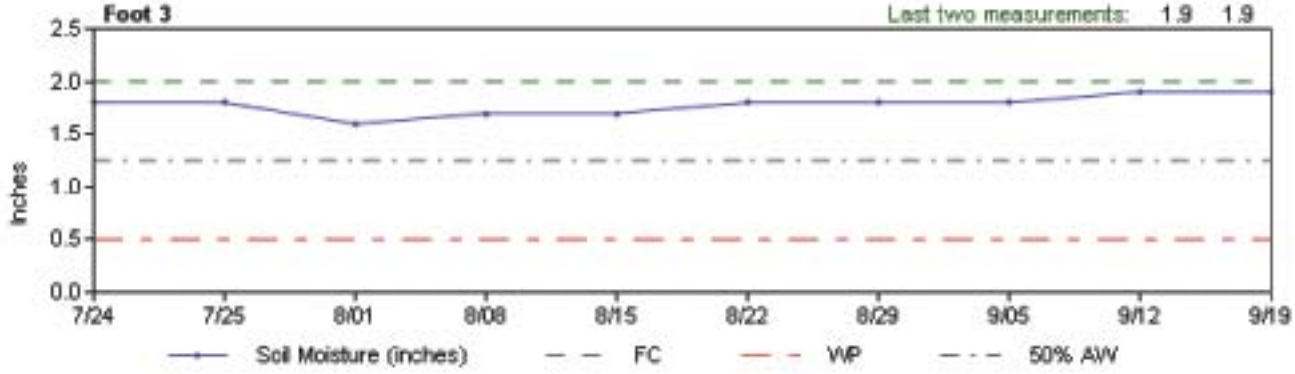
Foot 1 Last two measurements: 2.0 1.9



Foot 2 Last two measurements: 2.0 1.9



Foot 3 Last two measurements: 1.9 1.9



Root Zone Moisture for Top 3 Feet Last two measurements: 5.9 5.7