Crop Service

Advantage Trust

NW 1/4 16-15-1

Area: 148.98 ac

Farm Imagery

Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Number of Fields: 1
Area: 148.98 ac

- NW 1/4 16-15-1 (148.98 ac)
- Other Fields

Crop Service

Soil Test Point Sample ID

Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

- Field Boundary
- Soil Test Points

Crop Service

Soil Type

Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac

- Field Boundary

Soil Type

- Crete silty clay loam, 0 to 1 percent slopes (3.6 ac) (2.4%)
- Geary silt loam, 3 to 7 percent slopes (62.7 ac) (42.1%)
- Hobbs silt loam, occasionally flooded (25.3 ac) (16.9%)
- Irwin silty clay loam, 1 to 3 percent slopes (53.7 ac) (36.1%)
- Irwin silty clay loam, 3 to 7 percent slopes (3.8 ac) (2.5%)

Crop Service

Soil Test Results

Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Min:	4.5	5.9	1.8	11	24	11	182	1,038	274	15.7	25	10	0.3	0.4	0.8	5	14	25.3	1.9	11.3
Max:	7.6	7.1	3.3	167	168	11	716	4,378	1,282	30.9	148	24	6.0	1.0	1.9	46	126	81.7	8.7	38.6
Avg:	5.3	6.4	2.4	43	60	11	275	1,927	642	23.7	75	15	1.0	0.5	1.3	23	65	41.3	3.1	22.4

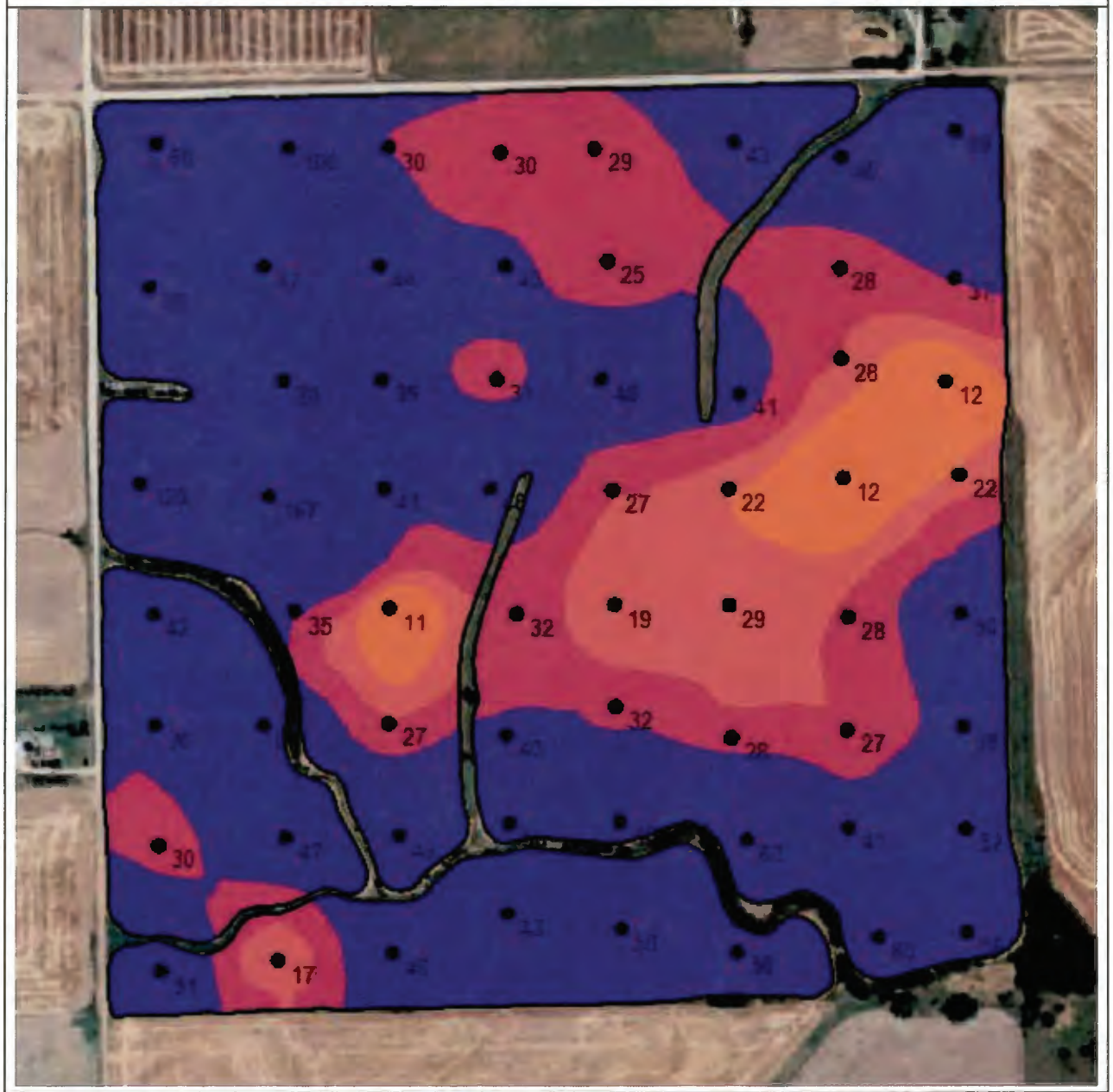
Sample ID	pH	BpH	OM	P Bray 1	P Bray 2	P Olsen	K	Ca	Mg	CEC	NO3-N lbs	S ppm	Zn	B	Cu	Mn	Fe	%Ca	%K	%Mg
1	4.7	6.1	3.0	51	62		224	1,457	768	28.8	115	19	1.2	0.5	1.4	43	92	25.3	2.0	22.2
2	6.8	7.1	2.9	17	49		237	2,867	748	21.2	54	14	1.1	0.8	1.0	10	34	67.7	2.9	29.4
3	4.7	6.1	3.3	46	58		313	1,717	558	28.3	130	17	1.2	0.5	1.3	32	82	30.3	2.8	16.4
4	5.7	6.6	2.8	43	62		379	1,601	551	17.2	31	10	1.0	0.5	1.1	10	60	46.5	5.6	26.7
5	5.5	6.5	2.7	50	74		360	1,591	551	18.2	52	14	1.2	0.5	1.2	12	64	43.7	5.1	25.2
6	5.8	6.6	3.0	58	83		340	1,644	571	17.1	40	13	1.4	0.6	1.3	11	83	48.1	5.1	27.8
7	4.5	5.9	3.2	30	40		298	1,369	441	26.9	115	21	1.2	0.4	1.7	46	65	25.4	2.8	13.7
8	6.3	6.7	2.2	47	82		316	1,918	549	16.8	50	10	0.9	0.6	1.0	11	36	57.1	4.8	27.2
9	5.1	6.4	2.6	54	70		309	1,645	548	21.9	59	13	1.1	0.5	1.5	26	78	37.6	3.6	20.9
10	4.8	6.4	2.3	36	41		219	1,356	520	22.1	99	16	0.9	0.4	1.2	30	58	30.7	2.5	19.6
11	4.8	6.3	2.7	42	57		217	1,544	489	23.4	112	14	1.8	0.4	1.4	28	82	33.0	2.4	17.4
12	6.2	6.6	3.0	129	153		716	2,701	604	23.2	70	16	6.0	0.7	1.8	8	79	58.2	7.9	21.7
13	5.7	6.4	2.2	36	54		298	2,207	1,122	26.7	77	13	1.2	0.6	1.6	15	51	41.3	2.9	35.0
14	5.2	6.5	2.5	68	95		269	2,344	820	29.3	146	23	1.3	0.5	1.5	31	74	40.0	2.4	23.3
15	5.1	6.3	2.4	100	131		280	2,039	704	27.1	68	14	0.7	0.5	1.4	22	87	37.6	2.6	21.6
16	4.9	6.3	2.5	47	60		218	1,558	616	24.1	95	17	0.7	0.5	1.5	24	97	32.3	2.3	21.3
17	5.1	6.3	2.4	28	47		288	1,959	909	29.2	74	15	0.7	0.5	1.7	25	75	33.5	2.5	25.9
18	5.5	6.5	3.0	167	168		608	1,555	469	17.9	34	13	2.7	0.6	1.9	11	126	43.4	8.7	21.8
19	7.0	7.1	2.7	35	86		319	3,098	601	21.3	32	11	1.2	0.8	1.0	5	34	72.7	3.8	23.5
20	5.9	6.6	2.5	43	80		248	1,747	490	16.3	56	12	0.9	0.6	1.0	14	43	53.6	3.9	25.1

Crop Service

21	4.9	6.5	2.3	27	31		211	1,470	551	22.3	121	17	0.7	0.5	1.1	31	47	33.0	2.4	20.6
22	5.8	6.5	2.3	11	24		239	2,374	1,168	27.4	81	16	0.3	0.7	1.2	22	33	43.3	2.2	35.5
23	4.9	6.3	2.3	41	54		248	1,682	732	27.0	74	15	0.6	0.5	1.4	30	64	31.1	2.4	22.6
24	4.7	6.2	2.5	39	51		223	1,243	516	22.4	79	15	0.7	0.5	1.4	33	107	27.7	2.6	19.2
25	4.8	6.3	2.6	44	55		211	1,739	679	28.1	121	18	0.7	0.5	1.4	31	93	30.9	1.9	20.1
26	5.2	6.5	2.4	30	40		220	2,007	753	25.8	108	18	0.8	0.5	1.2	21	61	38.9	2.2	24.3
27	5.3	6.5	2.6	30	43		262	2,226	782	26.5	79	15	0.6	0.5	1.3	19	67	42.0	2.5	24.6
28	5.4	6.3	2.2	40	53		252	2,041	976	26.6	47	12	0.6	0.5	1.4	21	66	38.4	2.4	30.6
29	5.1	6.4	2.4	31	49		268	2,023	859	29.0	77	17	0.5	0.5	1.4	25	71	34.9	2.4	24.7
30	5.2	6.2	2.6	48	64		278	1,791	1,182	29.8	94	17	0.9	0.6	1.4	29	70	30.1	2.4	33.1
31	5.4	6.4	2.3	32	45		212	2,111	741	24.2	59	14	0.8	0.5	1.3	19	63	43.6	2.2	25.5
32	4.8	6.2	2.6	40	53		210	1,361	367	19.6	74	14	0.9	0.4	1.3	31	70	34.7	2.7	15.6
33	4.8	6.2	2.7	58	74		274	1,400	431	21.3	97	17	1.3	0.5	1.4	38	80	32.9	3.3	16.9
34	5.1	6.3	2.9	46	58		318	1,428	426	18.6	47	12	1.5	0.5	1.2	21	79	38.4	4.4	19.1
35	5.2	6.3	2.5	32	37		223	1,514	643	20.6	40	14	0.7	0.5	1.1	20	56	36.7	2.8	26.0
36	5.9	6.5	2.3	19	29		242	2,370	948	24.6	50	13	0.9	0.6	1.0	13	32	48.2	2.5	32.1
37	6.6	6.8	2.6	27	58		269	3,419	556	23.8	43	14	0.5	0.7	0.9	12	28	71.8	2.9	19.5
38	4.9	6.3	2.3	48	65		218	1,460	487	21.3	58	13	0.9	0.5	1.3	23	97	34.3	2.6	19.1
39	5.5	6.3	2.4	25	43		274	1,828	1,282	27.7	49	13	0.6	0.6	1.2	19	56	33.0	2.5	38.6
40	5.4	6.3	2.6	29	50		275	2,246	939	27.7	68	14	0.6	0.5	1.3	19	63	40.5	2.5	28.2
41	5.0	6.3	2.3	43	59		255	2,113	747	29.5	95	17	0.6	0.5	1.4	21	61	35.8	2.2	21.1
42	4.7	6.2	2.6	41	55		262	1,886	619	30.9	115	16	0.7	0.4	1.3	31	57	30.5	2.2	16.7
43	6.7	7.1	2.7	22	58		202	3,521	414	21.6	43	13	0.6	0.6	0.8	10	28	81.6	2.4	16.0
44	5.2	6.4	2.2	29	38		205	1,901	645	23.5	90	14	0.8	0.5	1.2	21	52	40.4	2.2	22.9
45	4.9	6.3	2.3	28	36		182	1,468	472	20.9	54	14	0.7	0.4	1.1	23	49	35.1	2.2	18.8
46	4.7	6.2	3.0	63	79		223	1,251	275	18.4	70	12	1.4	0.4	1.5	28	88	34.0	3.1	12.5
47	4.5	6.1	2.0	80	82		384	1,038	274	20.2	148	24	1.0	0.4	1.2	46	79	25.7	4.9	11.3
48	4.8	6.4	2.1	41	47		246	1,503	318	20.4	104	13	0.8	0.4	1.2	28	76	36.8	3.1	13.0
49	5.0	6.4	2.0	27	35		208	1,587	421	20.3	50	13	0.7	0.4	1.2	24	67	39.1	2.6	17.3
50	5.5	6.4	1.9	28	43		277	2,019	1,002	25.9	63	15	0.6	0.5	1.2	27	48	39.0	2.7	32.2
51	7.6	7.1	2.4	12	45	11	282	4,378	502	26.8	25	12	0.5	1.0	0.8	6	14	81.7	2.7	15.6
52	5.1	6.5	2.2	28	37		251	1,942	680	25.8	85	16	0.7	0.5	1.3	27	61	37.6	2.5	22.0
53	5.0	6.4	2.0	28	36		263	1,611	596	23.2	63	15	0.6	0.5	1.3	22	75	34.7	2.9	21.4
54	5.2	6.3	2.5	46	62		341	2,100	702	26.3	61	13	1.1	0.5	1.5	27	73	39.9	3.3	22.2

55	4.6	6.4	2.2	68	92	281	1,629	559	29.4	104	20	0.9	0.4	1.4	41	85	27.7	2.5	15.8
56	4.9	6.3	2.0	37	47	244	1,665	638	25.5	95	19	1.2	0.5	1.2	31	56	32.6	2.5	20.8
57	6.5	6.7	1.8	12	29	233	2,931	684	22.7	45	13	0.5	0.7	0.8	13	22	64.6	2.6	25.1
58	6.0	6.6	2.1	22	30	266	2,654	992	26.1	63	15	0.5	0.7	1.0	17	30	50.8	2.6	31.7
59	5.0	6.3	2.1	50	60	248	1,775	448	22.4	90	16	0.9	0.5	1.2	31	68	39.6	2.8	16.7
60	5.0	6.3	2.0	38	50	199	1,591	349	19.3	68	14	0.9	0.5	1.3	30	90	41.2	2.6	15.1
61	4.8	6.3	2.2	52	64	278	1,669	357	22.7	103	17	1.0	0.4	1.2	29	83	36.8	3.1	13.1
62	5.8	6.6	2.0	56	78	311	1,569	489	15.7	58	13	1.0	0.6	1.2	15	66	50.0	5.1	26.0

P Bray 1 Surface



N

One in = 477 feet

0 223 447 670 894 1117

Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 12.23 ppm
Avg: 43.18 ppm
Max: 161.08 ppm

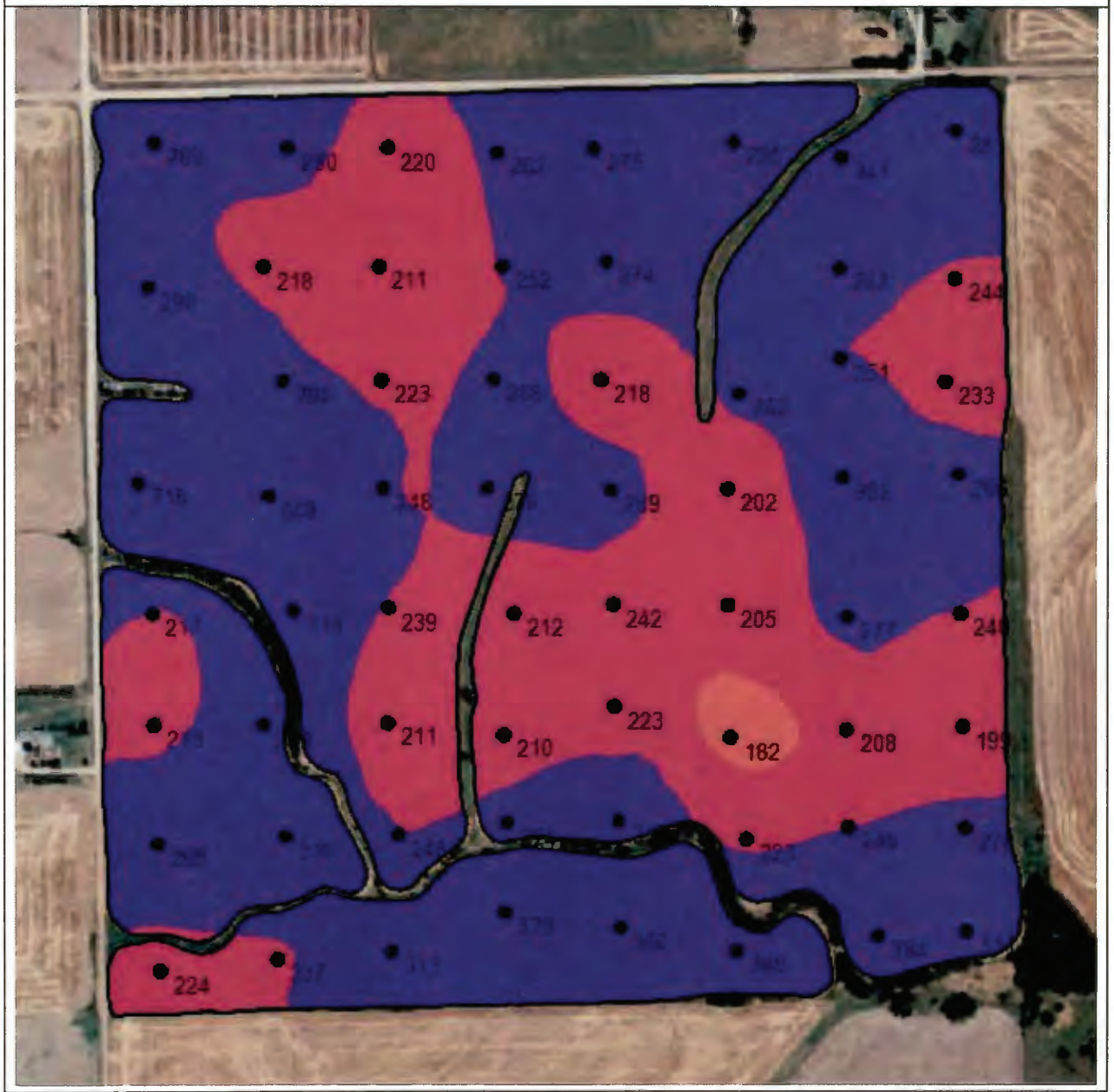
- Field Boundary

P Bray 1 Surface ppm

- Very Low 0 - 5 ppm (0.0 ac) (0.0%)
- Low 5 - 12 ppm (0.0 ac) (0.0%)
- Medium 12 - 22 ppm (8.2 ac) (5.5%)
- Optimum 22 - 27 ppm (13.7 ac) (9.2%)
- High 27 - 35 ppm (33.0 ac) (22.1%)
- Excess > 35 ppm (94.1 ac) (63.2%)

Crop Service

Potassium Surface



Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 185.68 ppm
Avg: 277.19 ppm
Max: 706.53 ppm

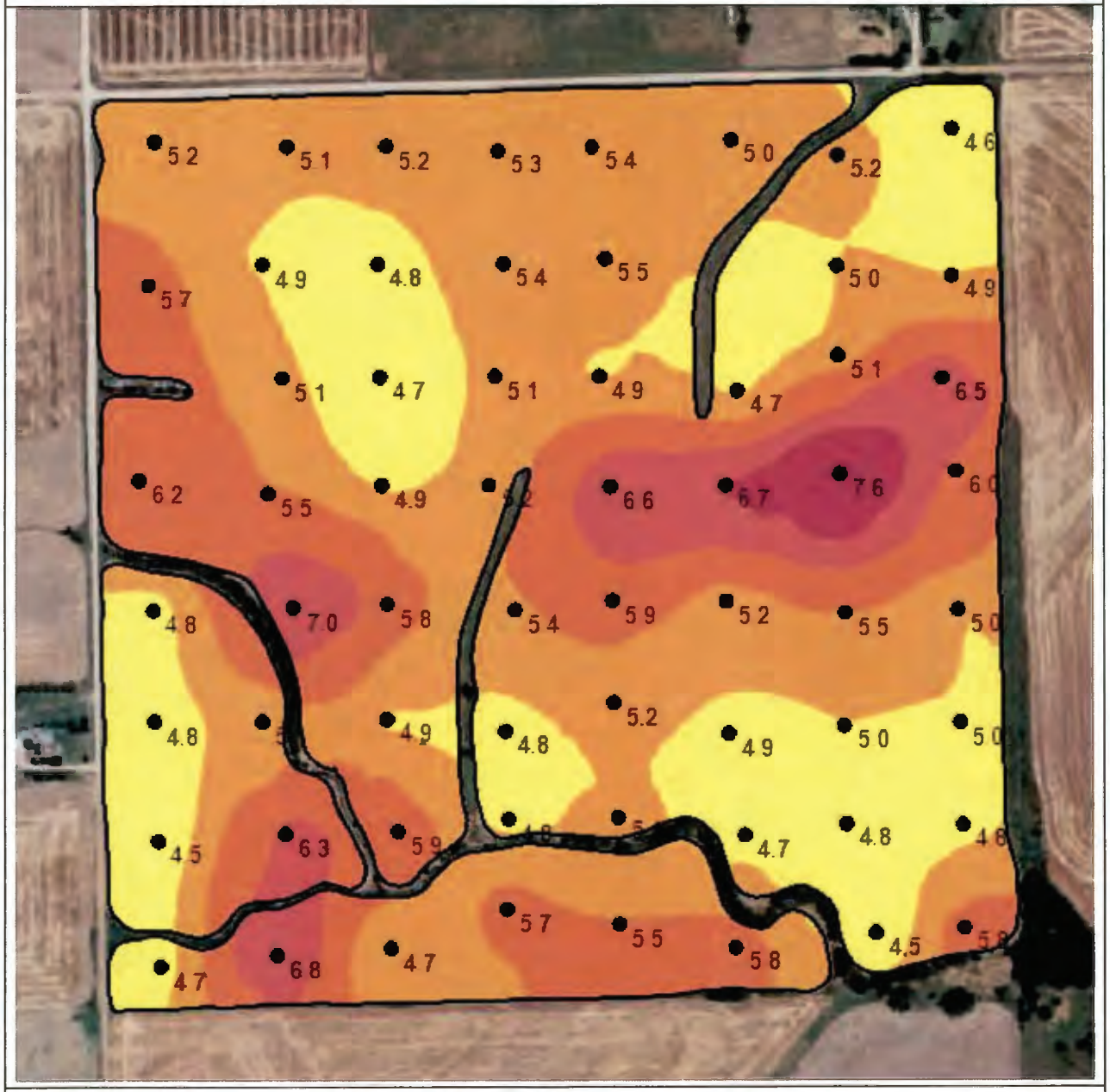
- Field Boundary

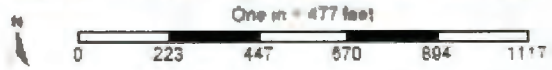
Potassium Surface ppm

- Very Low 0 - 40 ppm (0.0 ac) (0.0%)
- Low 40 - 80 ppm (0.0 ac) (0.0%)
- Medium 80 - 150 ppm (0.0 ac) (0.0%)
- Optimum 150 - 200 ppm (1.5 ac) (1.0%)
- High 200 - 250 ppm (54.5 ac) (36.6%)
- Very High > 250 ppm (93.0 ac) (62.4%)

Crop Service

pH Surface





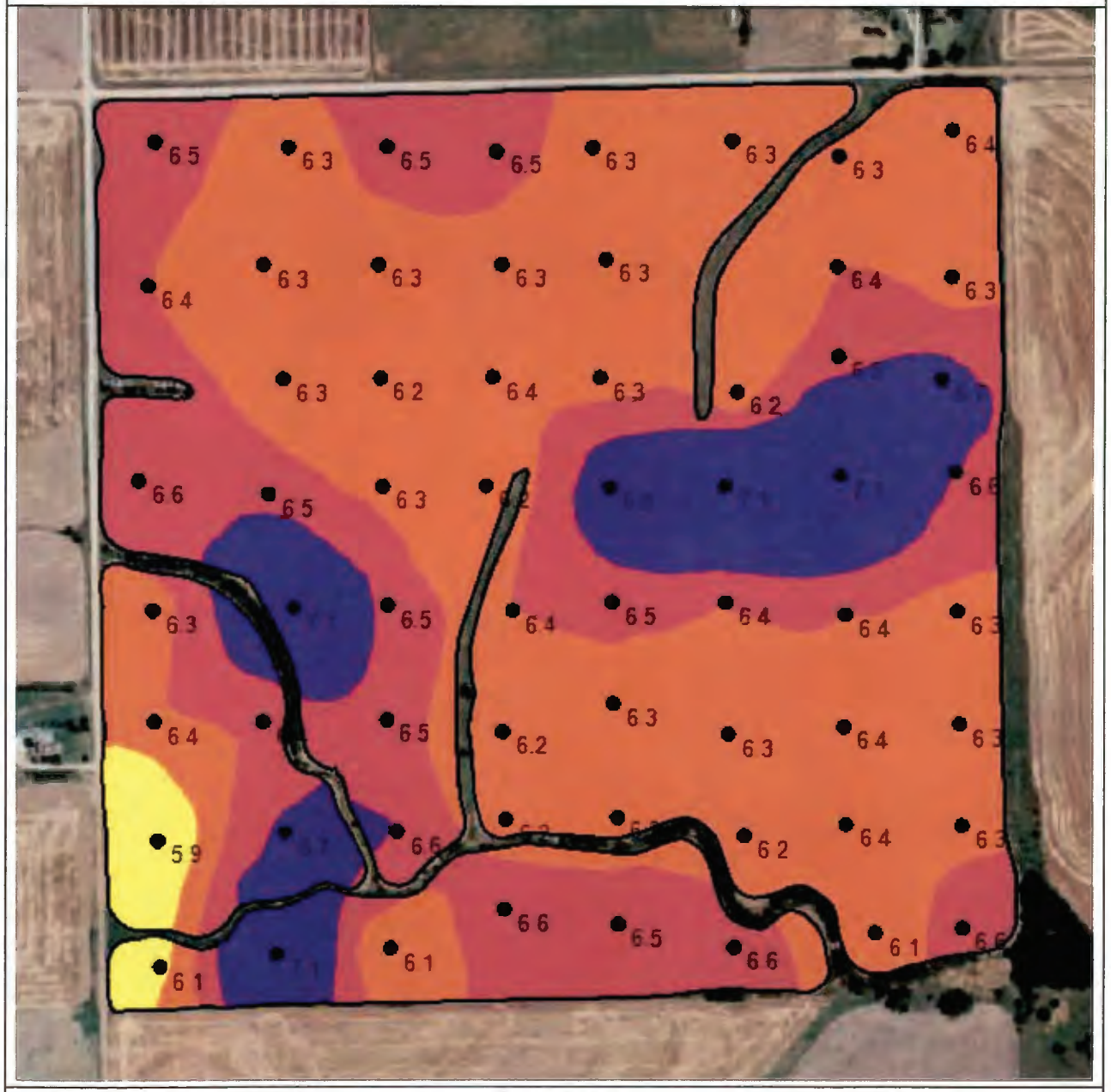
Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 4.41
Avg: 5.34
Max: 7.56

- Field Boundary
- pH Surface
- Excessive Acid 0 - 5 pH (38.3 ac) (25.7%)
- Acidic 5.1 - 5.5 pH (66.3 ac) (44.5%)
- Slightly Acidic 5.5 - 6.1 pH (31.0 ac) (20.8%)
- Grain Optimum 6.1 - 6.6 pH (10.4 ac) (7.0%)
- Alfalfa Optimum 6.6 - 7.5 pH (2.9 ac) (1.9%)
- Alkaline > 7.5 pH (0.1 ac) (0.1%)

Crop Service

BpH Surface



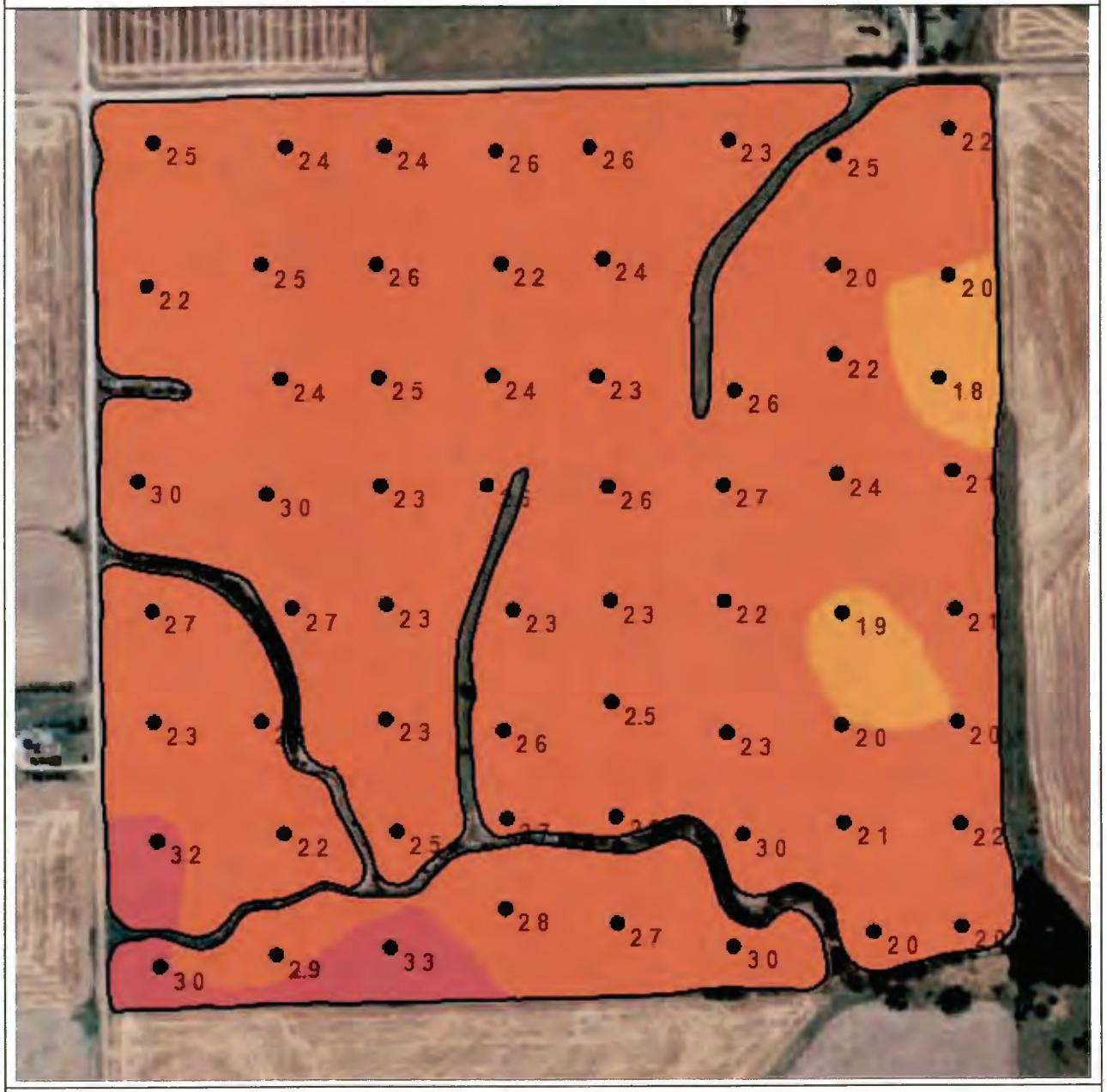
Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 5.92
Avg: 6.42
Max: 7.09

- Field Boundary
- BpH Surface
- 0.0 - 6.2 (3.8 ac) (2.5%)
- 6.2 - 6.4 (79.9 ac) (53.6%)
- 6.4 - 6.6 (45.8 ac) (30.8%)
- > 6.6 (19.5 ac) (13.1%)

Crop Service

Organic Matter Surface



Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 1.82 Percent
Avg: 2.46 Percent
Max: 3.25 Percent

- Field Boundary

Organic Matter Surface Percent

- 0.0 - 1.0 (%) (0.0 ac) (0.0%)
- 1.0 - 2.0 (6.3 ac) (4.2%)
- 2.0 - 3.0 (137.0 ac) (92.0%)
- 3.0 - 4.0 (5.7 ac) (3.8%)
- 4.0 - 5.0 (0.0 ac) (0.0%)
- > 5.0 (0.0 ac) (0.0%)

Crop Service

Cation Exchange Capacity Surface

Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 16.04 meq/100 g
Avg: 23.93 meq/100 g
Max: 30.28 meq/100 g

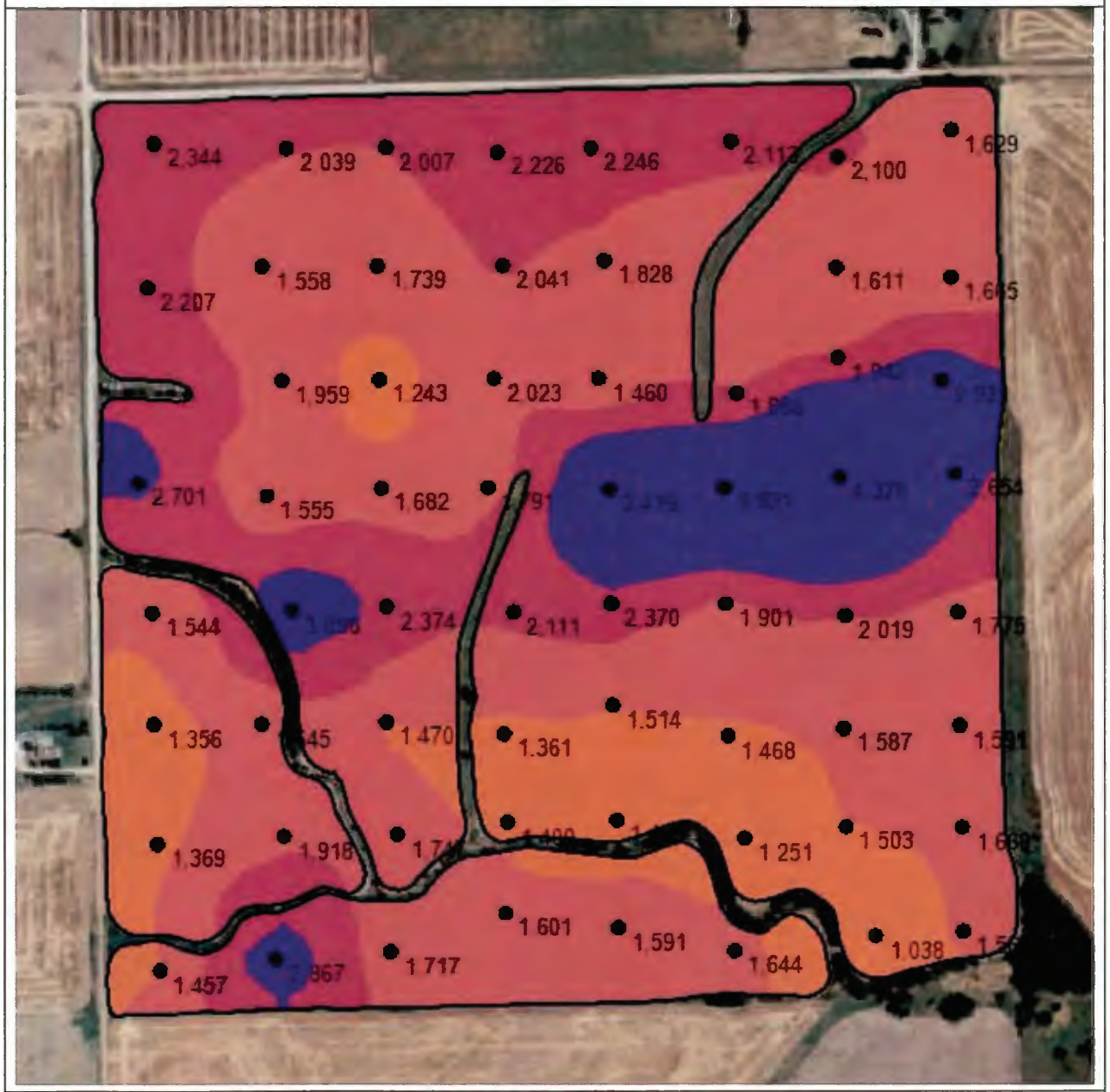
- Field Boundary

Cation Exchange Capacity Surface meq/100 g

- Very Light 0 - 5 (0.0 ac) (0.0%)
- Light 5 - 10 (0.0 ac) (0.0%)
- Optimum 1 10 - 15 (0.0 ac) (0.0%)
- Optimum 2 15 - 20 (22.8 ac) (15.3%)
- Heavy 20 - 25 (61.0 ac) (41.0%)
- Very Heavy > 25 (65.1 ac) (43.7%)

Crop Service

Calcium Surface



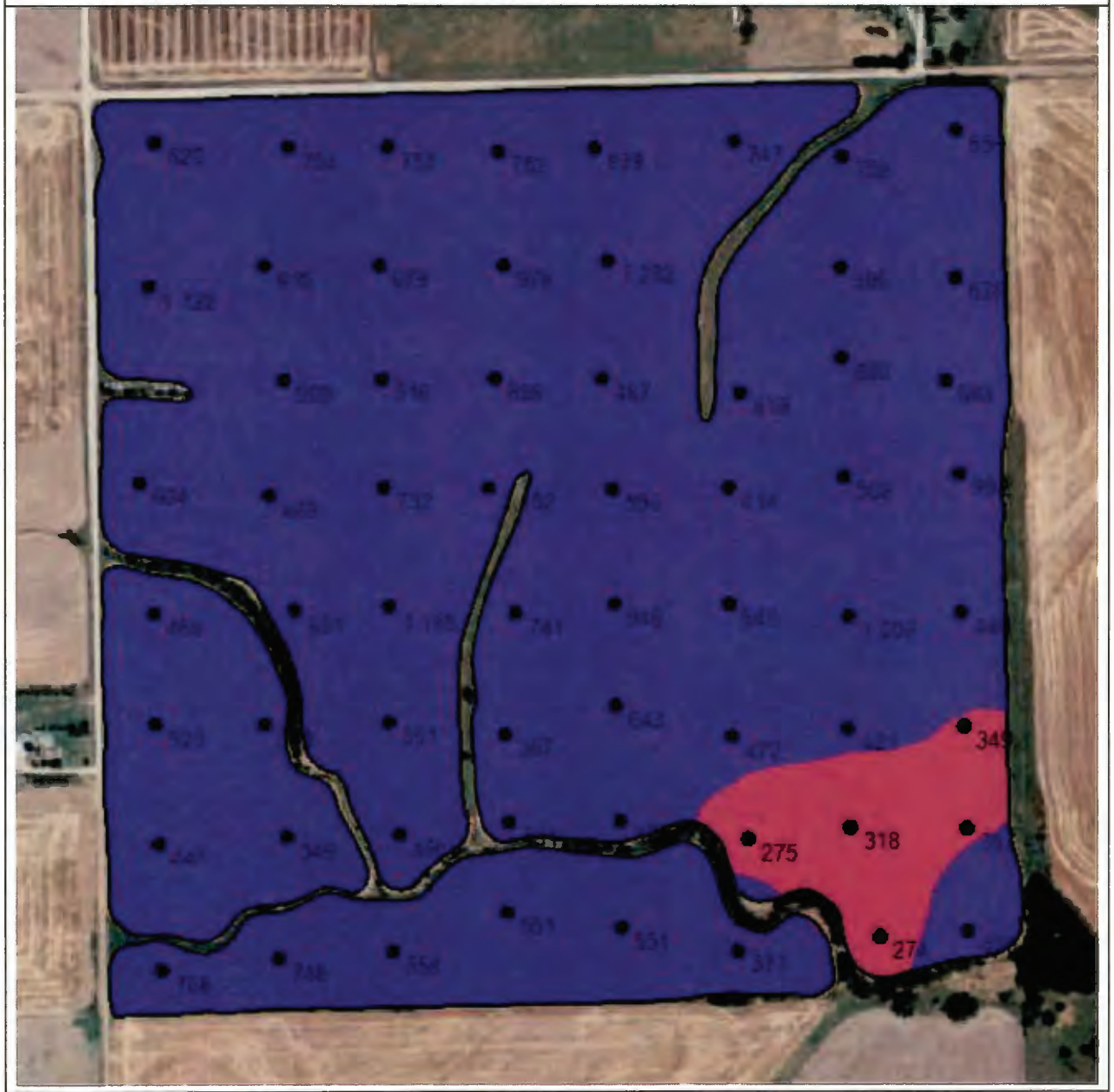
Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 1,104.13 ppm
Avg: 1,942.48 ppm
Max: 4,332.38 ppm

- Field Boundary
- Calcium Surface ppm
- Very Low 0 - 500 ppm (0.0 ac) (0.0%)
- Low 500 - 1000 ppm (0.0 ac) (0.0%)
- Medium 1000 - 1500 ppm (20.9 ac) (14.1%)
- Optimum 1500 - 2000 ppm (72.6 ac) (48.7%)
- High 2000 - 2500 ppm (38.6 ac) (25.9%)
- Very High > 2500 ppm (16.8 ac) (11.3%)

Crop Service

Magnesium Surface



One in = 477 feet

0 223 447 670 894 1117

Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 287.99 ppm
Avg: 657.29 ppm
Max: 1,221.35 ppm

- Field Boundary

Magnesium Surface ppm

- Very Low 0 - 37 ppm (0.0 ac) (0.0%)
- Low 37 - 75 ppm (0.0 ac) (0.0%)
- Medium 75 - 120 ppm (0.0 ac) (0.0%)
- Optimum 120 - 250 ppm (0.0 ac) (0.0%)
- High 250 - 375 ppm (8.6 ac) (5.8%)
- Excess > 375 ppm (140.4 ac) (94.2%)

Crop Service

Sulfur - ppm

Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 10.18 ppm
Avg: 14.94 ppm
Max: 22.67 ppm

- Field Boundary

Sulfur Surface ppm

- Very Low 0 - 5 ppm (0.0 ac) (0.0%)
- Low 5 - 10 ppm (0.0 ac) (0.0%)
- Medium 10 - 15 ppm (85.5 ac) (57.4%)
- Optimum 15 - 20 ppm (59.6 ac) (40.0%)
- High 20 - 25 ppm (3.8 ac) (2.6%)
- Very High > 25 ppm (0.0 ac) (0.0%)

Crop Service

Zinc Surface

Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 0.36 ppm
Avg: 1.00 ppm
Max: 5.88 ppm

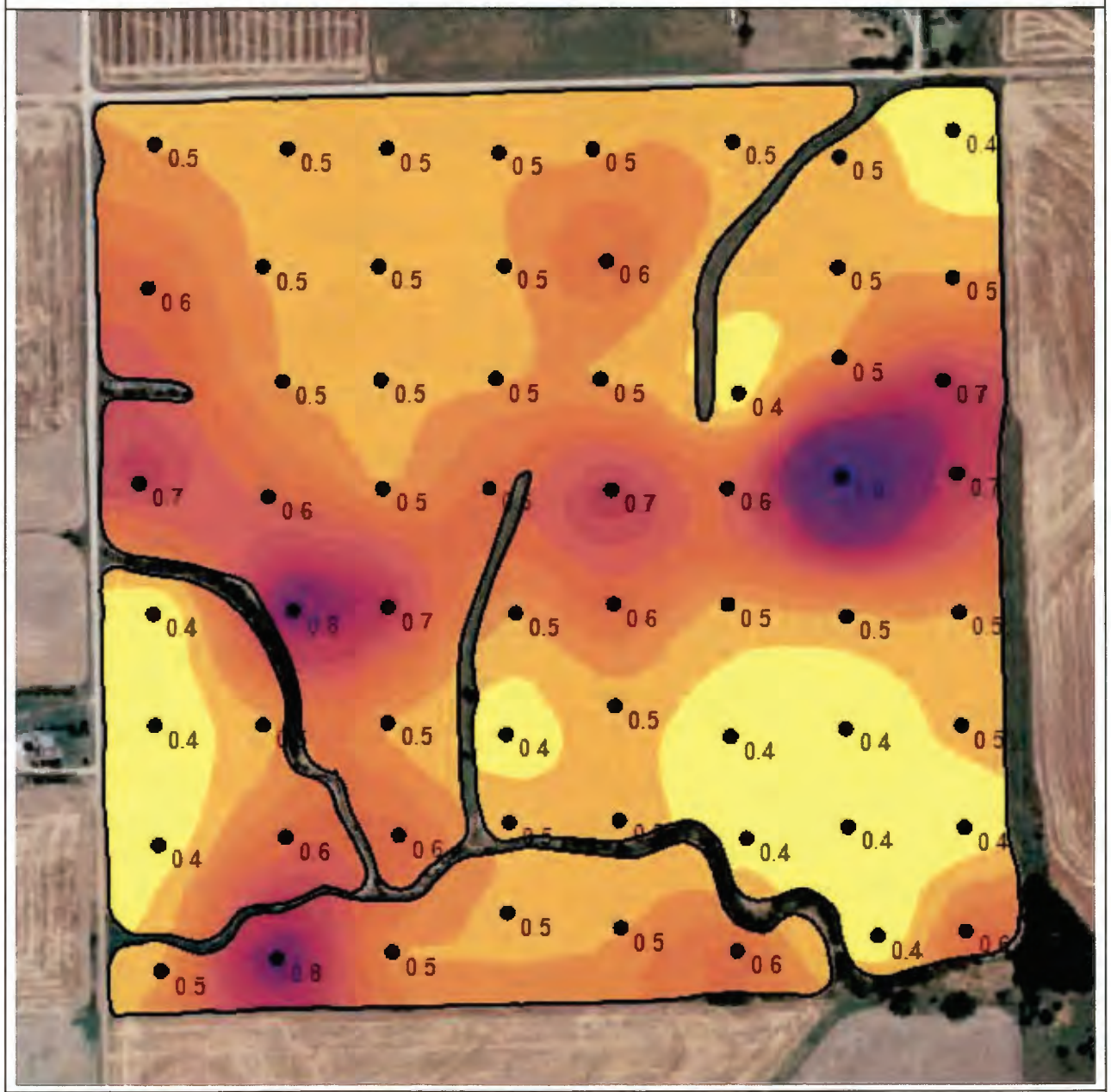
- Field Boundary

Zinc Surface ppm

- Very Low 0 - 0.5 ppm (1.4 ac) (0.9%)
- Low 0.5 - 1.0 ppm (97.6 ac) (65.5%)
- Medium 1.0 - 2.5 ppm (44.3 ac) (29.8%)
- Optimum 2.5 - 4.0 ppm (3.5 ac) (2.4%)
- High 4.0 - 6.0 ppm (2.1 ac) (1.4%)
- Very High > 6.0 ppm (0.0 ac) (0.0%)

Crop Service

Boron Surface



N

One in = 477 feet

0 223 447 670 894 1117

Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 0.38 ppm
Avg: 0.53 ppm
Max: 0.99 ppm

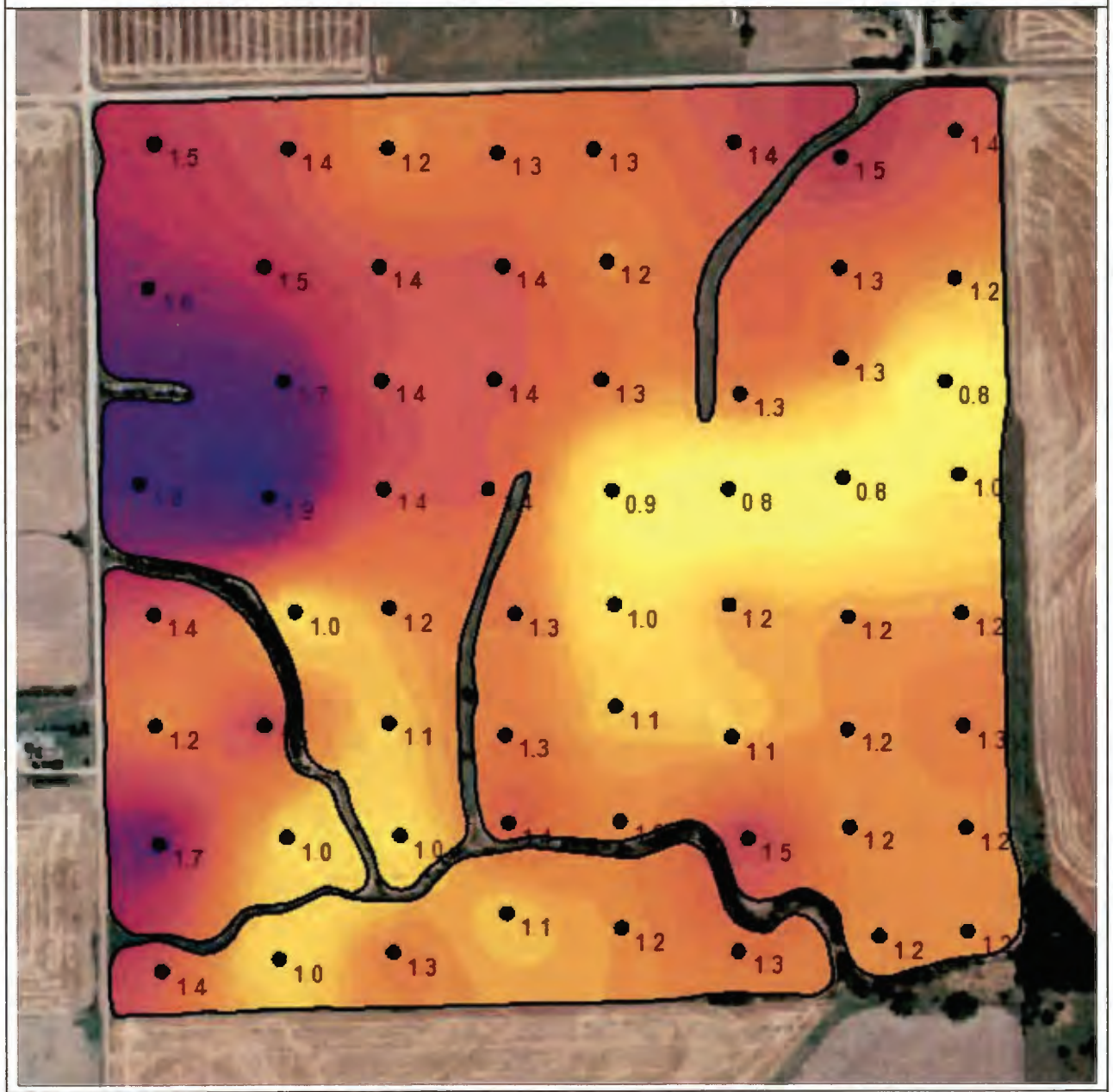
- Field Boundary

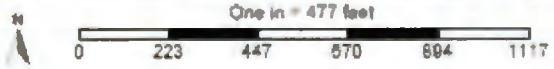
Boron Surface ppm

- 0.4 - 0.5 (25.9 ac) (17.4%)
- 0.5 - 0.5 (73.9 ac) (49.6%)
- 0.5 - 0.6 (32.4 ac) (21.7%)
- 0.6 - 0.7 (13.7 ac) (9.2%)
- 0.8 - 1 (3.1 ac) (2.1%)

Crop Service

Copper Surface





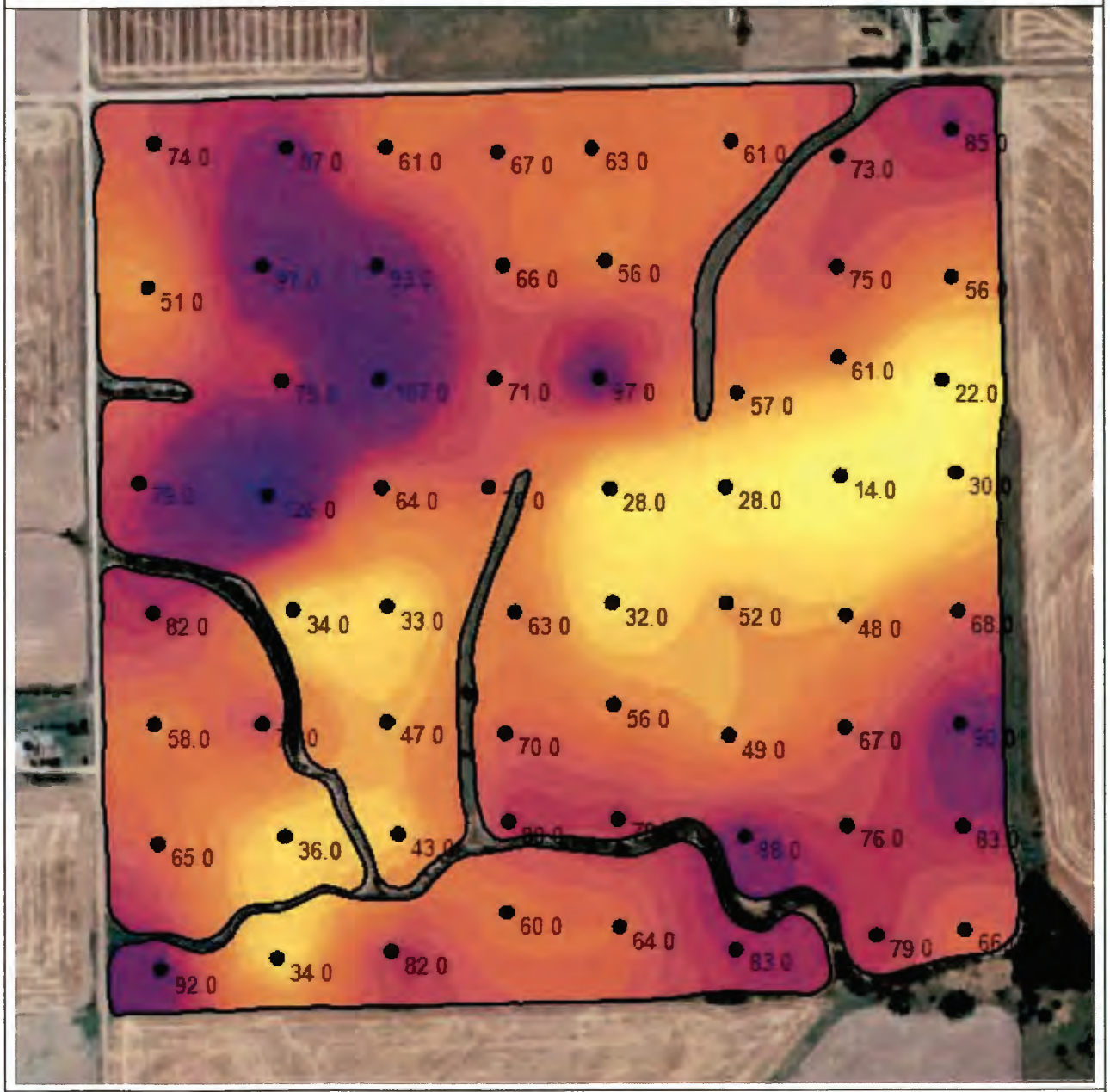
Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 0.81 ppm
Avg: 1.28 ppm
Max: 1.87 ppm

Field Boundary
Copper Surface ppm
0.8 - 1.1 (25.1 ac) (16.8%)
1.1 - 1.3 (49.4 ac) (33.2%)
1.3 - 1.4 (43.7 ac) (29.3%)
1.4 - 1.6 (21.3 ac) (14.3%)
1.6 - 1.9 (9.5 ac) (6.4%)

Crop Service

Iron Surface



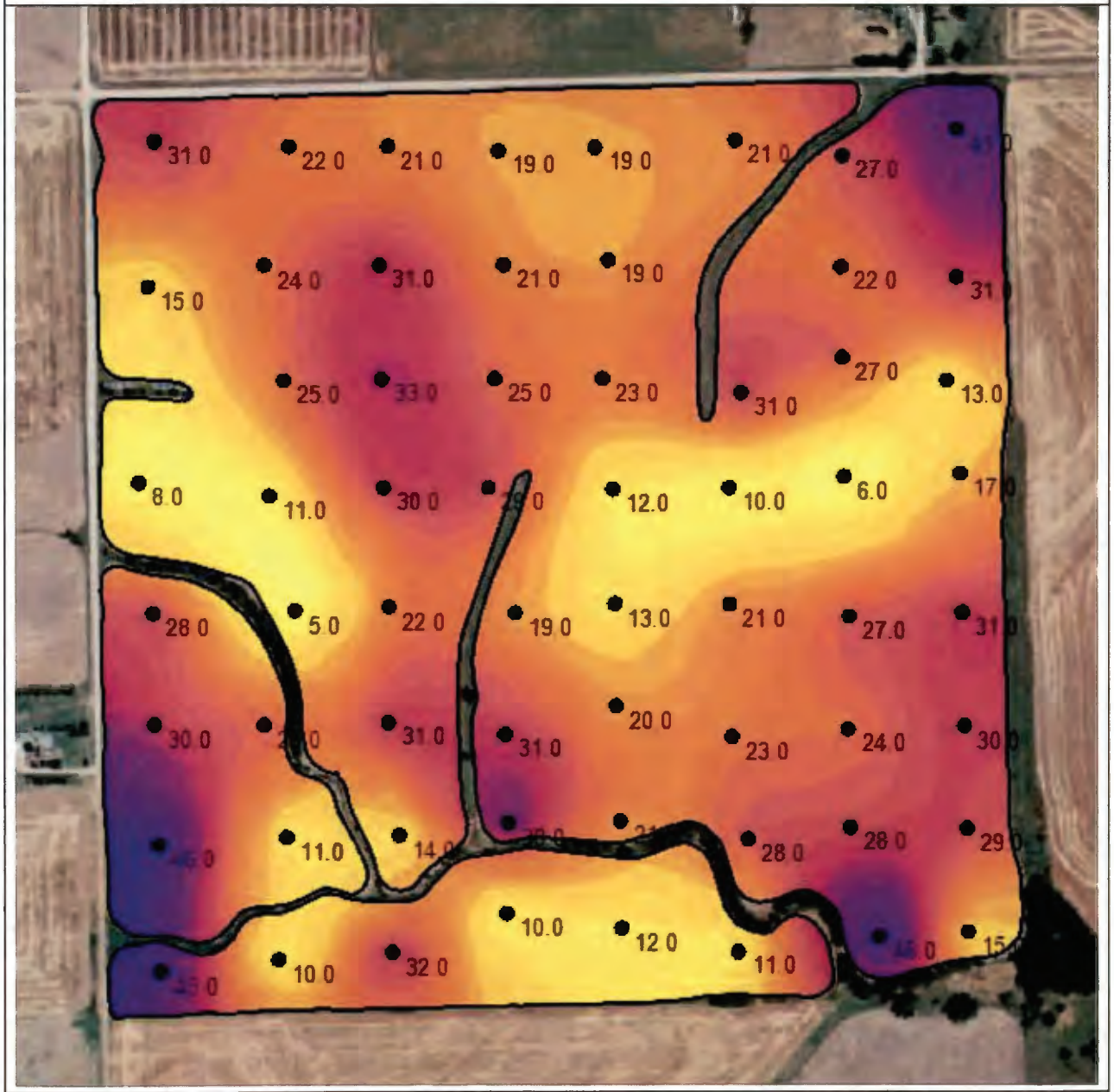
Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 14.49 ppm
Avg: 64.88 ppm
Max: 121.61 ppm

—	Field Boundary
	Iron Surface ppm
	14.5 - 43.1 (19.1 ac) (12.8%)
	43.3 - 59 (27.7 ac) (18.6%)
	59.1 - 71.9 (47.5 ac) (31.9%)
	72 - 85.2 (40.1 ac) (26.9%)
	85.3 - 121.6 (14.5 ac) (9.8%)

Crop Service

Manganese Surface



Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 6.34 ppm
Avg: 22.90 ppm
Max: 46.26 ppm

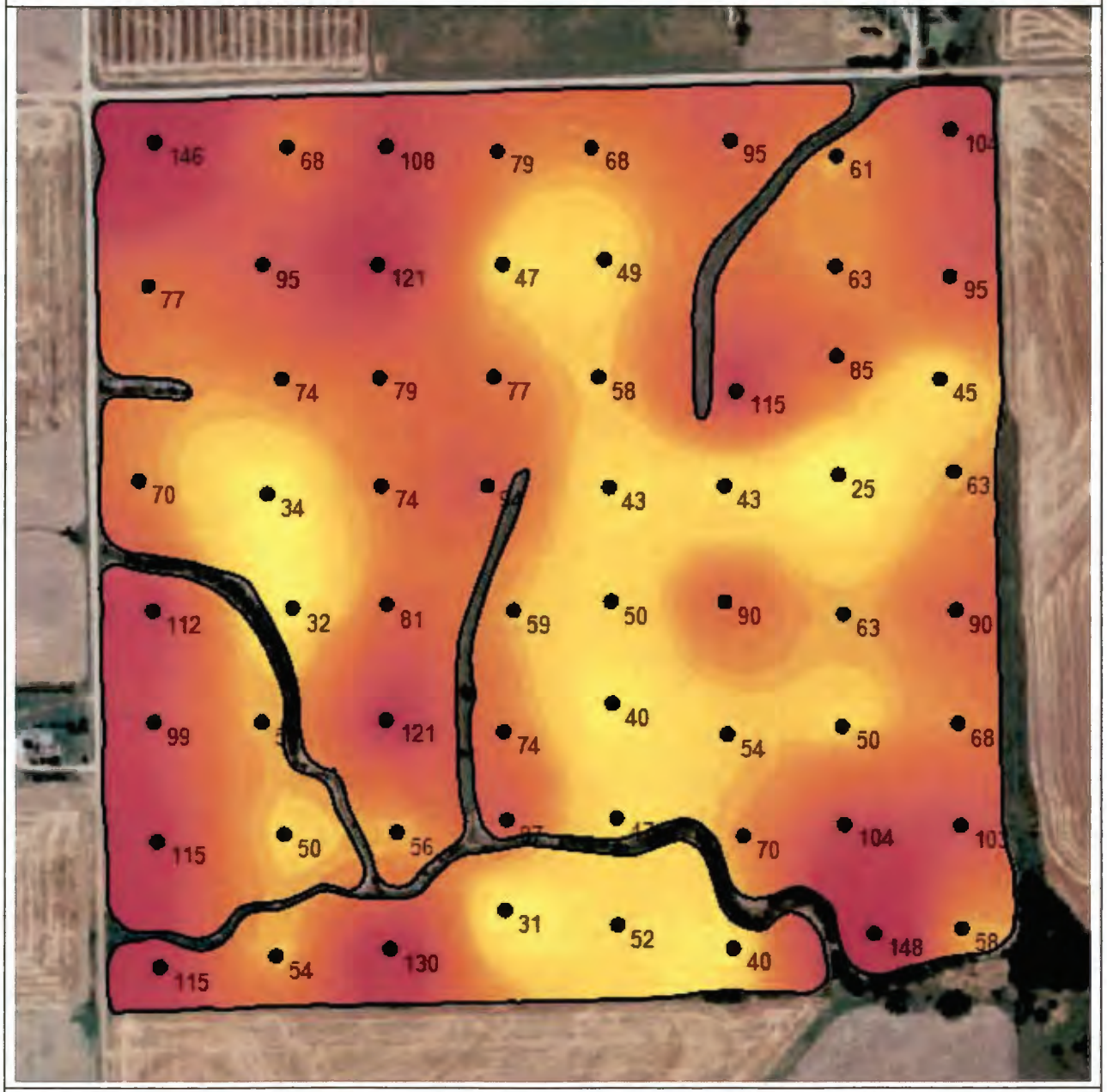
- Field Boundary

Manganese Surface ppm

- 6.3 - 16.5 (28.4 ac) (19.1%)
- 16.5 - 22 (37.1 ac) (24.9%)
- 22 - 27 (45.0 ac) (30.2%)
- 27 - 34.7 (31.1 ac) (20.8%)
- 34.8 - 46.3 (7.4 ac) (4.9%)

Crop Service

NO3-N - lbs



Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 25.96 lb/ac
Avg: 75.08 lb/ac
Max: 143.45 lb/ac

Field Boundary
NO3-N lb/ac
26 - 58 (32.5 ac) (21.8%)
58 - 73 (41.2 ac) (27.7%)
73 - 89 (40.6 ac) (27.3%)
89 - 107 (23.5 ac) (15.8%)
107 - 143 (11.1 ac) (7.4%)

Crop Service

pct Ca

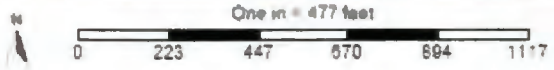
Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 22.81
Avg: 41.18
Max: 80.89

—	Field Boundary
	pct Ca
	22.8 - 35.4 (41.0 ac) (27.5%)
	35.4 - 42 (58.2 ac) (39.1%)
	42 - 50.3 (26.4 ac) (17.7%)
	50.3 - 61.1 (15.7 ac) (10.6%)
	61.6 - 80.9 (7.6 ac) (5.1%)

Crop Service

pct H



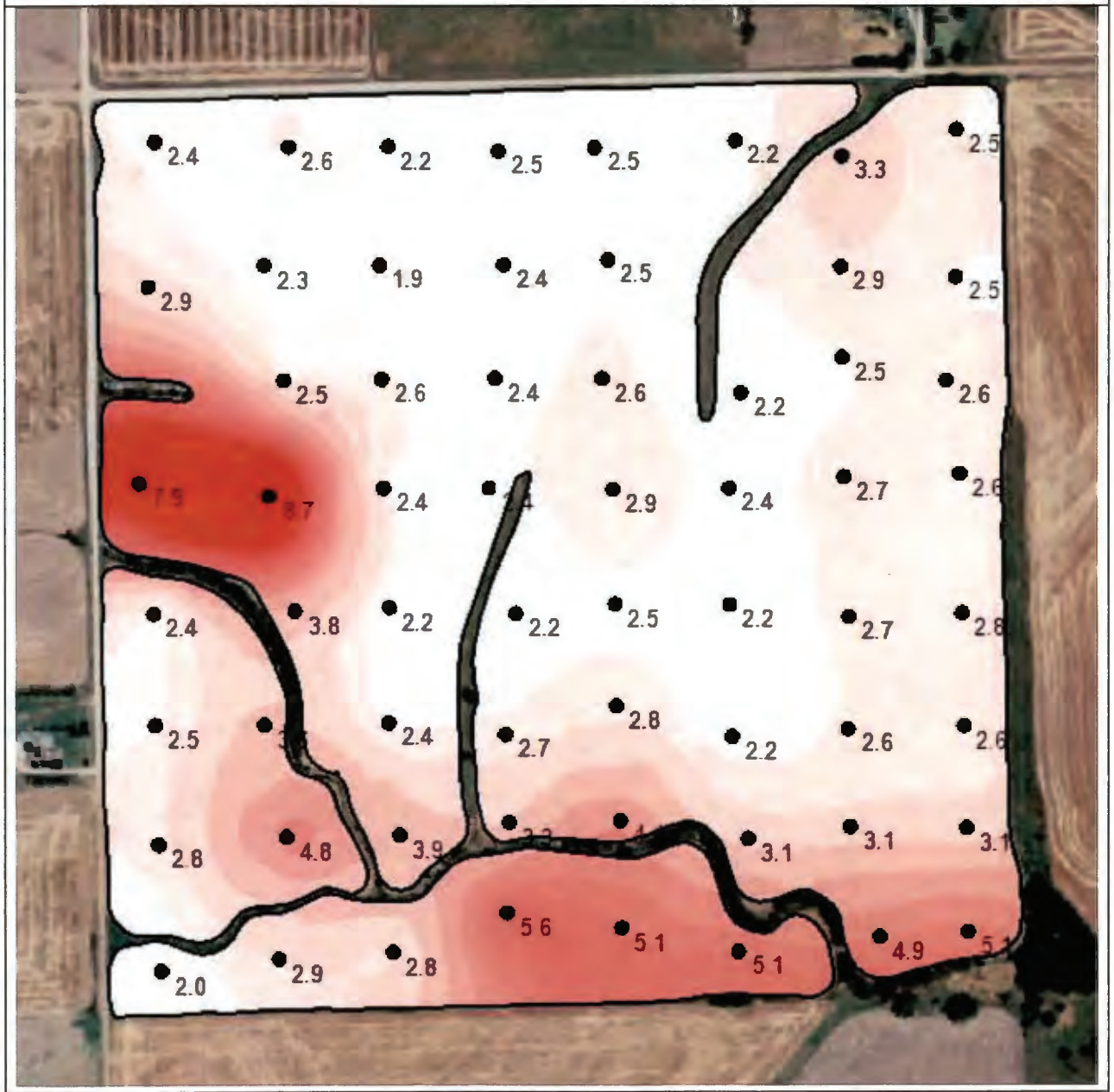
Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 7.91
Avg: 35.11
Max: 57.82

- Field Boundary
- pct H
- 7.9 - 22.3 (14.2 ac) (9.5%)
- 22.5 - 30 (30.5 ac) (20.5%)
- 30.1 - 36.3 (32.2 ac) (21.6%)
- 36.3 - 42.9 (39.9 ac) (26.8%)
- 42.9 - 57.8 (32.1 ac) (21.5%)

Crop Service

pct K



Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 1.92
Avg: 3.08
Max: 8.49

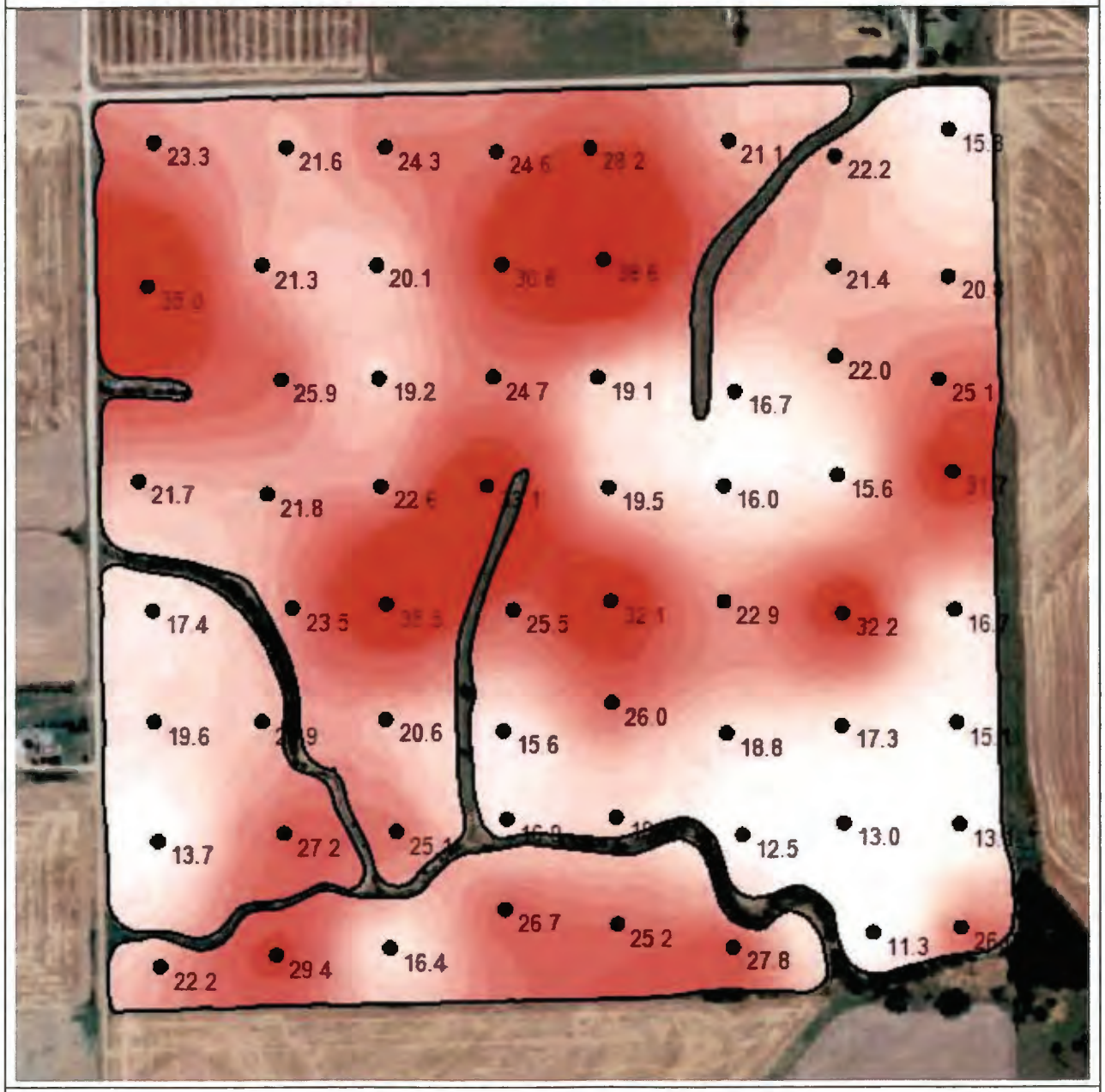
- Field Boundary

pct K

- 1.9 - 3 (103.4 ac) (69.4%)
- 3 - 4.2 (24.3 ac) (16.3%)
- 4.2 - 5.4 (15.3 ac) (10.3%)
- 5.4 - 6.5 (2.7 ac) (1.8%)
- 6.6 - 8.5 (3.4 ac) (2.3%)

Crop Service

pct Mg



Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac
Event Date(s): 8/6/2018

Season: 2018
Min: 12.31
Avg: 22.70
Max: 36.91

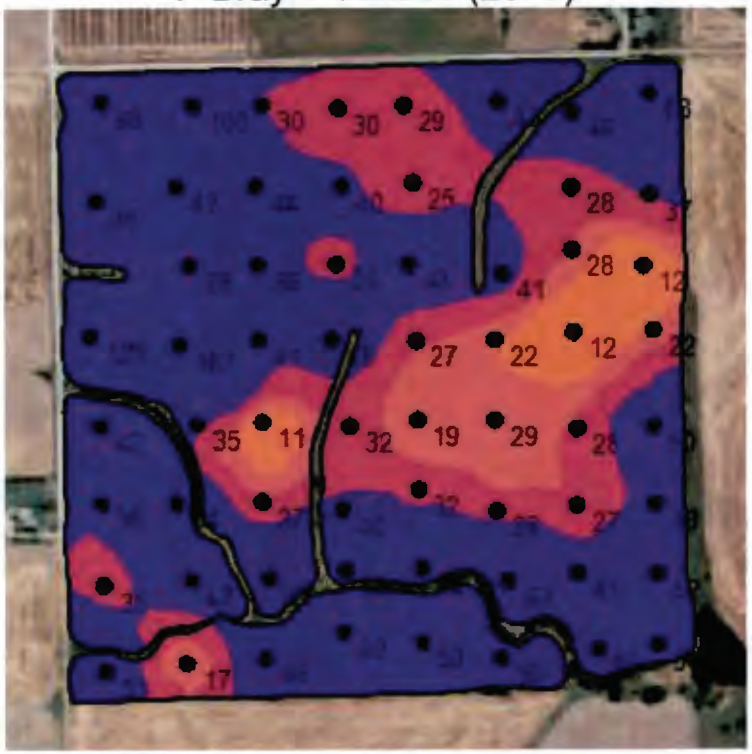
- Field Boundary

pct Mg

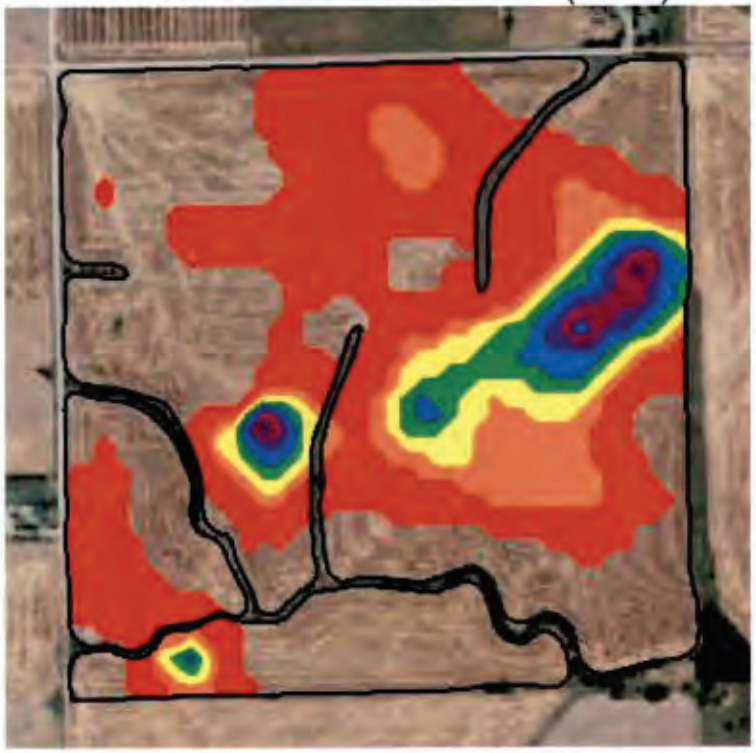
- 12.3 - 18.8 (28.4 ac) (19.0%)
- 18.9 - 22.4 (43.7 ac) (29.4%)
- 22.4 - 25.3 (36.7 ac) (24.6%)
- 25.3 - 28.6 (26.2 ac) (17.6%)
- 28.6 - 36.9 (13.9 ac) (9.4%)

Crop Service

P Bray 1 Surface (2018)



P Product Recommendation (2018)



Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac

Event Date(s): 8/6/2018
Season: 2018
Min: 12.23 ppm
Avg: 43.18 ppm
Max: 161.08 ppm

Season: 2018
Min Rate: 40.00 lb/ac
Avg Rate: 48.80 lb/ac
Max Rate: 110.00 lb/ac
Total Product: 3,859.09 lb
Applied Area: 79.09 ac
Product: 11-52-0 MAP

Order Id: 713416
Order Task Id: 19869000
Crop - Year 1: WHEAT
Purpose - Year 1: Dry Grain
Yield Goal - Year 1: 70
ICP?: No
Task: Main Recs - P Rec

- Field Boundary
- P Bray 1 Surface ppm
- Very Low 0 - 5 ppm (0.0 ac) (0.0%)
- Low 5 - 12 ppm (0.0 ac) (0.0%)
- Medium 12 - 22 ppm (8.2 ac) (5.5%)
- Optimum 22 - 27 ppm (13.7 ac) (9.2%)
- High 27 - 35 ppm (33.0 ac) (22.1%)
- Excess > 35 ppm (94.1 ac) (63.2%)

- Field Boundary
- P Product Recommendation lb/ac
- 40 (49.0 ac) (32.9%)
- 50 (12.5 ac) (8.4%)
- 60 (6.7 ac) (4.5%)
- 70 (4.6 ac) (3.1%)
- 80 (3.0 ac) (2.0%)
- 90 (1.7 ac) (1.1%)
- 100 (1.4 ac) (0.9%)
- 110 (0.2 ac) (0.1%)

Crop Service

Potassium Surface (2018)

K Product Recommendation (2018)

Grower: Ritchie Tam
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac

Event Date(s): 8/6/2018
Season: 2018
Min: 185.68 ppm
Avg: 277.19 ppm
Max: 706.53 ppm

Season: 2018
Min Rate: 40.00 lb/ac
Avg Rate: 42.51 lb/ac
Max Rate: 50.00 lb/ac
Total Product: 268.75 lb
Applied Area: 6.32 ac
Product: 0-0-60

Order Id: 713416
Order Task Id: 19869001
Crop - Year 1: WHEAT
Purpose - Year 1: Dry Grain
Yield Goal - Year 1: 70
Task: Main Recs - K Rec

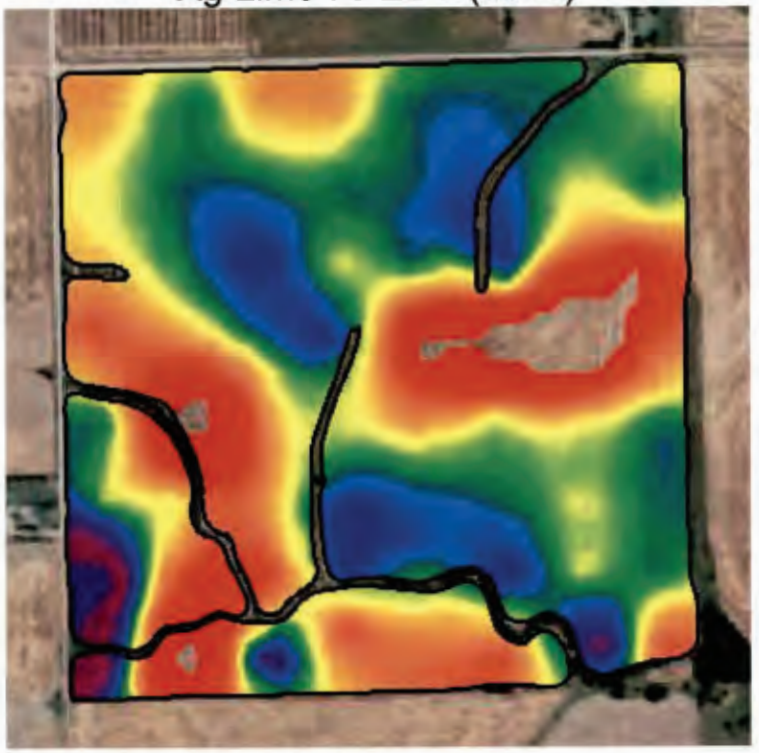
- Field Boundary
- Potassium Surface ppm
- Very Low 0 - 40 ppm (0.0 ac) (0.0%)
- Low 40 - 80 ppm (0.0 ac) (0.0%)
- Medium 80 - 150 ppm (0.0 ac) (0.0%)
- Optimum 150 - 200 ppm (1.5 ac) (1.0%)
- High 200 - 250 ppm (54.5 ac) (36.6%)
- Very High > 250 ppm (93.0 ac) (62.4%)

- Field Boundary
- K Product Recommendation lb/ac
- 40 (3.3 ac) (2.2%)
- 45 (2.8 ac) (1.9%)
- 50 (0.2 ac) (0.1%)

Crop Service

pH Surface (2018)

Ag Lime 70 ECC (2018)



Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac

Event Date(s): 8/6/2018
Season: 2018
Min: 4.41
Avg: 5.34
Max: 7.56

Season: 2018
Min Rate: 2,400.00 lb/ac
Avg Rate: 6,576.13 lb/ac
Max Rate: 11,700.00 lb/ac
Total Product: 942,831.51 lb
Applied Area: 143.37 ac
Product: Lime, Ag

Order Id: 713416
Order Task Id: 19868969
Target pH: 6.5
Incorporation Depth: 6
Task: Heartland Recs - Heartland Lime

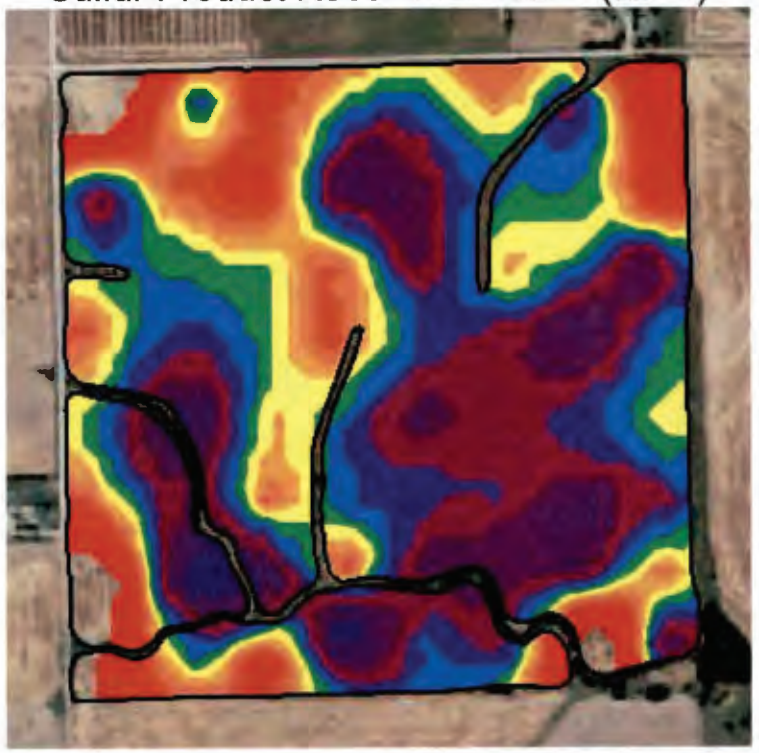
- Field Boundary
- pH Surface
- Excessive Acid 0 - 5 pH (38.3 ac) (25.7%)
- Acidic 5.1 - 5.5 pH (66.3 ac) (44.5%)
- Slightly Acidic 5.5 - 6.1 pH (31.0 ac) (20.8%)
- Grain Optimum 6.1 - 6.6 pH (10.4 ac) (7.0%)
- Alfalfa Optimum 6.6 - 7.5 pH (2.9 ac) (1.9%)
- Alkaline > 7.5 pH (0.1 ac) (0.1%)

- Field Boundary
- Lime Product Recommendation lb/ac
- 2400 - 4600 (12.7 ac) (8.5%)
- 4700 - 6000 (31.6 ac) (21.2%)
- 6100 - 6900 (35.3 ac) (23.7%)
- 7000 - 7500 (34.5 ac) (23.1%)
- 7600 - 8000 (18.5 ac) (12.4%)
- 8100 - 9200 (8.1 ac) (5.5%)
- 9400 - 10800 (1.8 ac) (1.2%)
- 10900 - 11700 (0.9 ac) (0.6%)

Crop Service

Sulfur - ppm (2018)

Sulfur Product Recommendation (2018)



Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac

Event Date(s): 8/6/2018
Season: 2018
Min: 10.18 ppm
Avg: 14.94 ppm
Max: 22.67 ppm

Season: 2018
Min Rate: 3.00 lb/ac
Avg Rate: 10.39 lb/ac
Max Rate: 19.00 lb/ac
Total Product: 1,502.11 lb
Applied Area: 144.57 ac
Product: Sulfur

Order Id: 713416
Order Task Id: 19868998
Crop - Year 1: Wheat
Purpose - Year 1: Dry Grain
Yield Goal - Year 1: 70
Task: KSU Recs - S Rec

- Field Boundary
- Sulfur Surface ppm
- Very Low 0 - 5 ppm (0.0 ac) (0.0%)
- Low 5 - 10 ppm (0.0 ac) (0.0%)
- Medium 10 - 15 ppm (85.5 ac) (57.4%)
- Optimum 15 - 20 ppm (59.6 ac) (40.0%)
- High 20 - 25 ppm (3.8 ac) (2.6%)
- Very High > 25 ppm (0.0 ac) (0.0%)

- Field Boundary
- Sulfur Product Recommendation lb/ac
- 3 - 5 (11.8 ac) (7.9%)
- 6 - 8 (24.7 ac) (16.6%)
- 9 (14.5 ac) (9.7%)
- 10 (15.2 ac) (10.2%)
- 11 (17.8 ac) (11.9%)
- 12 (18.6 ac) (12.5%)
- 13 (22.1 ac) (14.8%)
- 14 - 19 (19.9 ac) (13.4%)

Crop Service

Zinc Surface (2018)

Zinc Product Recommendation

Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac

Event Date(s): 8/6/2018
Season: 2018
Min: 0.36 ppm
Avg: 1.00 ppm
Max: 5.88 ppm

- Field Boundary
- Zinc Surface ppm
- Very Low 0 - 0.5 ppm (1.4 ac) (0.9%)
- Low 0.5 - 1.0 ppm (97.6 ac) (65.5%)
- Medium 1.0 - 2.5 ppm (44.3 ac) (29.8%)
- Optimum 2.5 - 4.0 ppm (3.5 ac) (2.4%)
- High 4.0 - 6.0 ppm (2.1 ac) (1.4%)
- Very High > 6.0 ppm (0.0 ac) (0.0%)

Crop Service

Product Summary

Season: 2018
Grower: Ritchie Tarn
Farm: Advantage Trust
Field: NW 1/4 16-15-1
Area: 148.98 ac

K2O

Recommendation	Rec Acres	Avg Rec Rate	App Acres	Avg App Rate	Total Product
0-0-60 713416 19869001 8/10/2018 2:51:49 PM(local) WHEAT Dry Grain 70	149.0	1.8 lb/ac	6.3	42.5 lb/ac	268.7 lb

Lime

Recommendation	Rec Acres	Avg Rec Rate	App Acres	Avg App Rate	Total Product
Lime, Ag 713416 19868969 8/10/2018 2:51:49 PM(local) 6.5 6	149.0	6,328.4 lb/ac	143.4	6,576.1 lb/ac	942,831.5 lb

Nitrogen

Recommendation	Rec Acres	Avg Rec Rate	App Acres	Avg App Rate	Total Product
46-0-0 Urea 713416 19868999 8/10/2018 2:51:49 PM(local) WHEAT Dry Grain 70	149.0	83.5 lb/ac	141.2	88.1 lb/ac	12,441.6 lb

P2O5

Recommendation	Rec Acres	Avg Rec Rate	App Acres	Avg App Rate	Total Product
11-52-0 MAP 713416 19869000 8/10/2018 2:51:49 PM(local) WHEAT Dry Grain 70 No	149.0	25.9 lb/ac	79.1	48.8 lb/ac	3,859.1 lb

Crop Service

Sulfur

Recommendation	Rec Acres	Avg Rec Rate	App Acres	Avg App Rate	Total Product
Sulfur 713416 19868998 8/10/2018 2:51:49 PM(local) Wheat Dry Grain 70	149.0	10.1 lb/ac	144.6	10.4 lb/ac	1,502.1 lb

Crop Service

Plant nutrients in the soil

Soil is a major source of nutrients needed by plants for growth. The three main nutrients are nitrogen (N), phosphorus (P) and potassium (K). Together they make up the trio known as NPK. Other important nutrients are calcium, magnesium and sulfur. Plants also need small quantities of iron, manganese, zinc, copper, boron and molybdenum, known as trace elements because only traces are needed by the plant. The role these nutrients play in plant growth is complex, and this document provides only a brief outline.

Major elements

Nitrogen (N)

Nitrogen is a key element in plant growth. It is found in all plant cells, in plant proteins and hormones, and in chlorophyll.

Atmospheric nitrogen is a source of soil nitrogen. Some plants such as legumes fix atmospheric nitrogen in their roots; otherwise fertilizer factories use nitrogen from the air to make ammonium sulfate, ammonium nitrate and urea. When applied to soil, nitrogen is converted to mineral form, nitrate, so that plants can take it up. Nitrate is easily leached out of soil by heavy rain, resulting in soil acidification. You need to apply nitrogen in small amounts often so that plants use all of it, or in organic form such as composted manure, so that leaching is reduced.

Phosphorus (P)

Phosphorus helps transfer energy from sunlight to plants, stimulates early root and plant growth, and hastens maturity.

Potassium (K)

Potassium increases vigor and disease resistance of plants, helps form and move starches, sugars and oils in plants, and can improve grain quality.

Calcium (Ca)

Calcium is essential for root health, growth of new roots and root hairs, and the development of leaves. Lime, gypsum, dolomite and superphosphate (a mixture of calcium phosphate and calcium sulfate) all supply calcium. Lime is the cheapest and most suitable option for the North Coast.

Magnesium (Mg)

Magnesium is a key component of chlorophyll, the green colouring material of plants, and is vital for photosynthesis (the conversion of the sun's energy to food for the plant). Deficiencies occur mainly on sandy acid soils in high rainfall areas.

Magnesium deficiency can be overcome with dolomite (a mixed magnesium-calcium carbonate), magnesite (magnesium oxide) or epsom salts (magnesium sulfate).

Sulfur (S)

Sulfur is a constituent of amino acids in plant proteins and is involved in energy-producing processes in plants.

Trace elements

Iron (Fe)	Iron is a constituent of many compounds that regulate and promote growth and is readily available in the North Coast's acid soils.
Manganese (Mn)	Manganese helps with photosynthesis. It is freely available in the North Coast's acid soils, often in toxic amounts in very acid soils, but can be deficient in sandy soils. Toxicity is remedied with lime.
Copper (Cu)	Copper is an essential constituent of enzymes in plants and is readily available in North Coast soils, although it can be deficient in red soils. Overuse of another trace element, molybdenum, can cause copper deficiency in animals.
Zinc (Zn)	Zinc helps in the production of a plant hormone responsible for stem elongation and leaf expansion. It is readily available in acid soils, but combines easily with iron in the North Coast's red soils. This is easily cured with the addition of zinc sulfate or crushed zinc minerals.
Boron (B)	Boron helps with the formation of cell walls in rapidly growing tissue. Deficiency reduces the uptake of calcium and inhibits the plant's ability to use it. It is chronically deficient in North Coast soils.
Molybdenum (Mo)	Molybdenum helps bacteria and soil organisms convert nitrogen in the air to soluble nitrogen compounds in the soil, so is particularly needed by legumes. It is also essential in the formation of proteins

from soluble nitrogen compounds.

Molybdenum deficiency is prevalent in the North Coast's acid soils, but can be remedied easily with applications of Mo super, molybdenum trioxide (applied during inoculation and lime pelleting of legume seed), or sodium molybdate (sprayed on young emerging plants).

From the Soil Sense leaflet 8/92. Agdex 531, produced by Rebecca Lines-Kelly, formerly soils media officer, Wollongbar Agricultural Institute, for CaLM and NSW Agriculture, North Coast region, under the National Landcare Program, October 1992

Lime Recommendation (8-15-18)

Grower: Ritchie Tarn

Farm: Advantage Trust

Field: NW ¼ 16-15-1

Applied area: 143.4 acres

Total product: 944,831 lbs

Average rate per acre: 6328 lbs

Rates

Trucking: $5/ton

Lime: $11/ton

Application: $7/acre

Cost: $57.70/Acre

Total job: $8572