

Plant Tuff Potato Trial 2016
Mid-Michigan Agronomy, LLC
White Pigeon, MI

Objective: To evaluate the effect of Plant Tuff Silicon Fertilizer on the growth, yield, and quality of two potato varieties.

This trial was established as a Complete Split-Block design and the ANOVA was run using that design. Two potato cultivars were planted in a 4-row plot. The first two rows were planted to Russet Norkotah and the second two rows were planted to a Frito Lay variety, FL2137. The treatments were applied to the plot uniformly using a handheld broadcast spreader. Treatments were randomized and replicated four times. Potato emergence was evaluated on 6/15/2016, forty-seven days after planting.

Plots were harvested on 9/15/2016 and yields were determined. Yields (CWT/Plot) for the two varieties were measured for each treatment. Potatoes were sized and measured for quality and weights for US-1 (10 oz-14 oz.) and B size (< 8 oz.). Total weight per plot was also determined. Premiums are paid for US-1 size potatoes. Numbers of potatoes for each variety were measured to determine the number of potatoes per plot that were US-1, the number that were B grade, and the total number of potatoes per treatment.

Location: White Pigeon, MI
Soil Type: Silty Clay Loam

Planting Date: 04/27/2016
Treatment Date: 04/27/2016
Harvest Date: 09/15/2016
Variety: **Russet Norkotah**
FL2137 (Chipping Variety)

Pre-Treatment

Soil Si Range: 18-140 PPM
Soil Si Avg.: 67 PPM
Soil Si Outliers: 420, 490

Parameters Measured: Emergence
Stand
Vigor
Canopy
Total Yield (CWT/Trt)
Weight of US-1 and Grade B
Total Number of Potatoes (#/Trt)
Number of US-1 and Grade B

Treatments:

<u>Material</u>	<u>Rate</u>
Untreated Check	---0---
Ag Lime	1 T/A
Plant Tuff	0.5 T/A
Plant Tuff	1 T/A
Plant Tuff	2 T/A

Table 1. Emergence, Vigor, Canopy and Yield for Russet Norkotah (CWT)

Treatment	Rate	Stand	Stand	Vigor	Canopy	Yield US-1	Yield BCWT	Yield Total	Yield Number US-1	Yield Number B
Check	0	70	75	2.5	54.2	504	76.9	581	74513	25784
Ag Lime	1	70.1	73	2.5	57.5	506	N/A	791	72566	33164
Plant Tuff	0.5	65.4	70	1.3	83.3	513	91.7	604	74821	28352
Plant Tuff	1	75.3	82.3	1	95	517	84.6	602	66826	25418
Plant Tuff	2	71.1	75.3	1	95	547	93.3	641	77793	26511

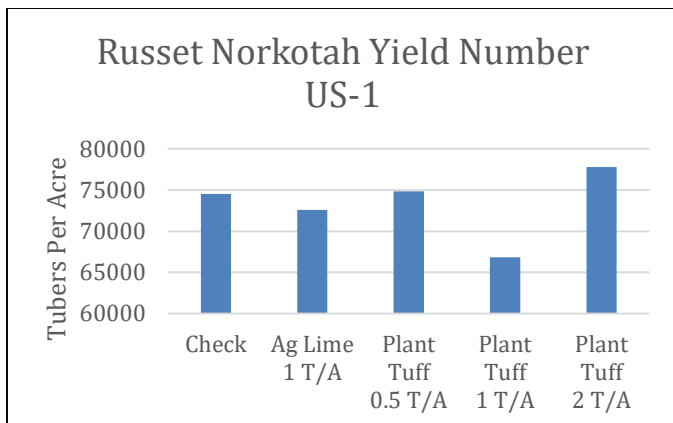
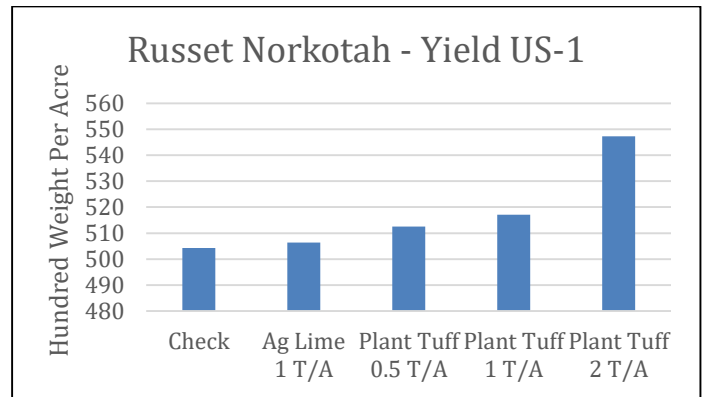
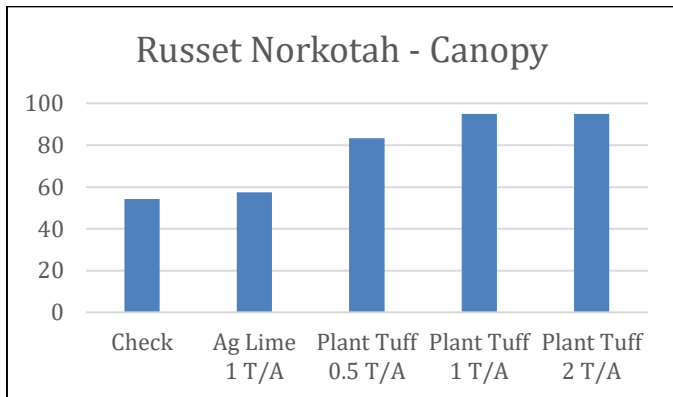
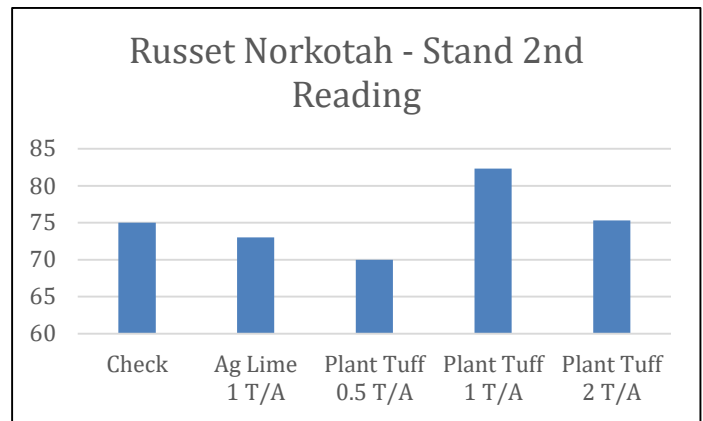
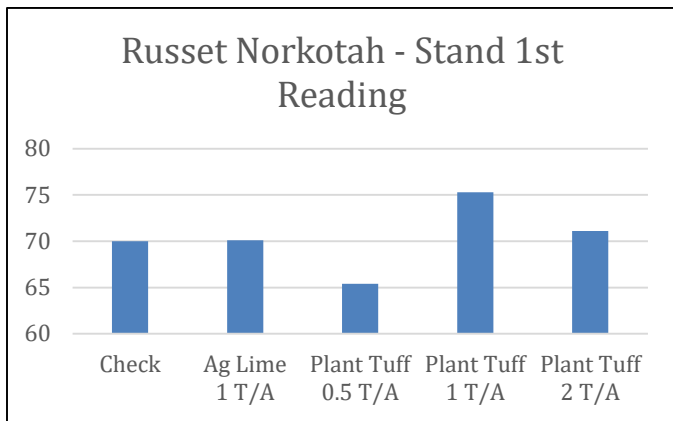
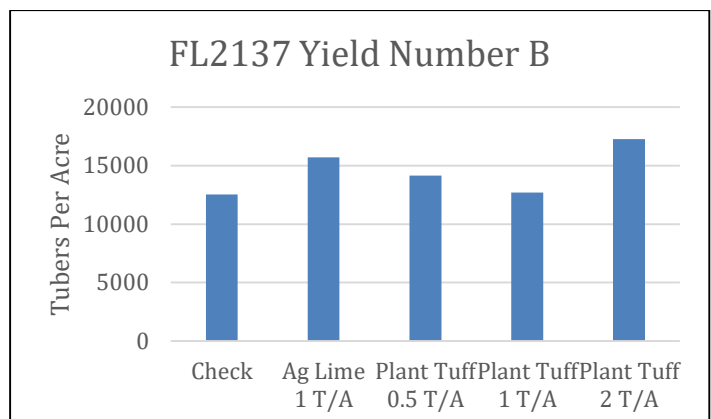
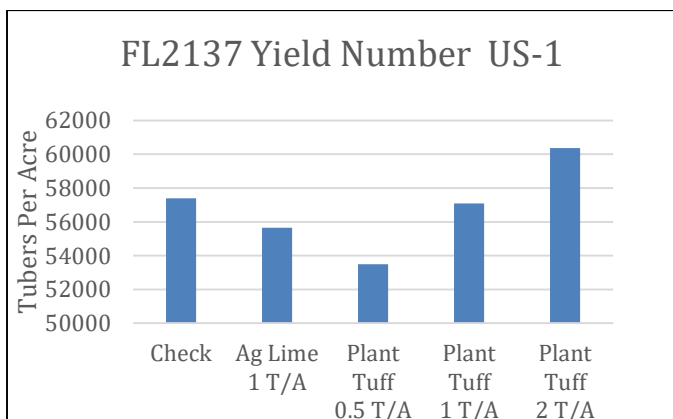
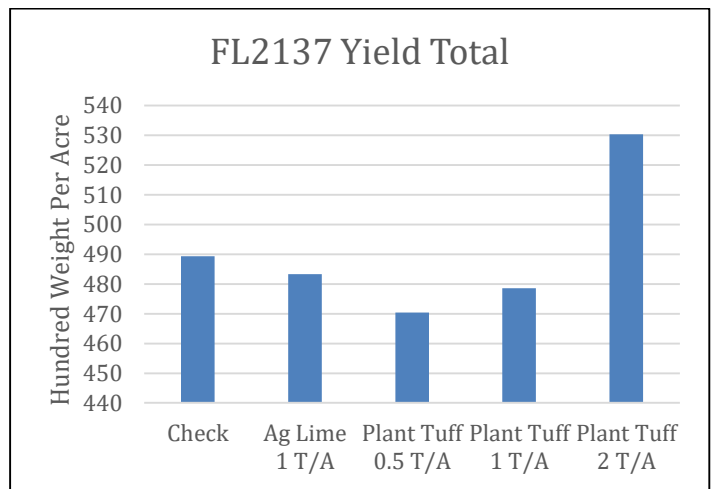
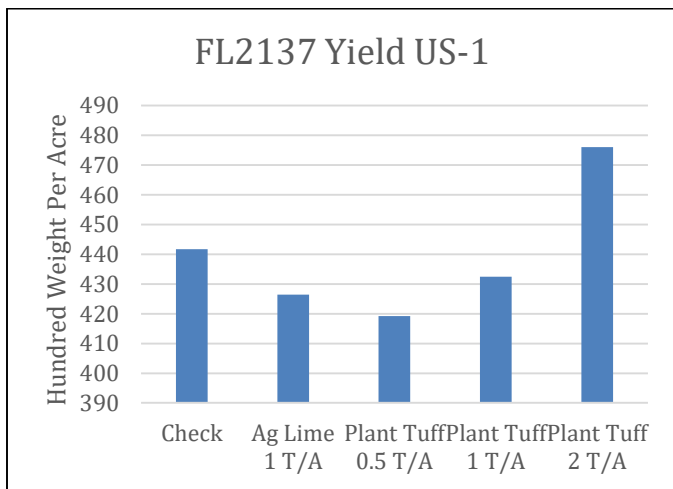
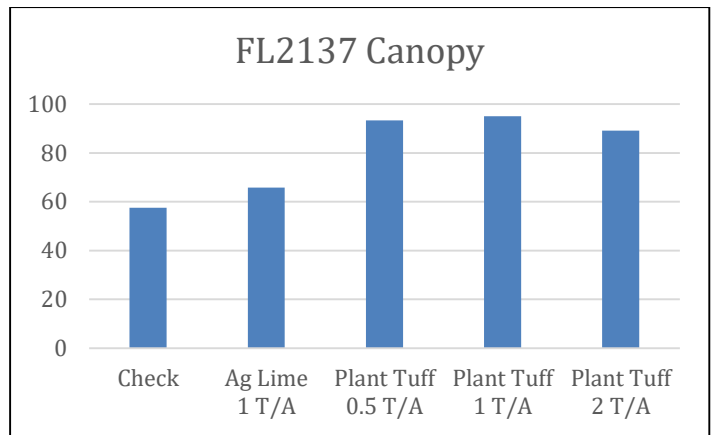
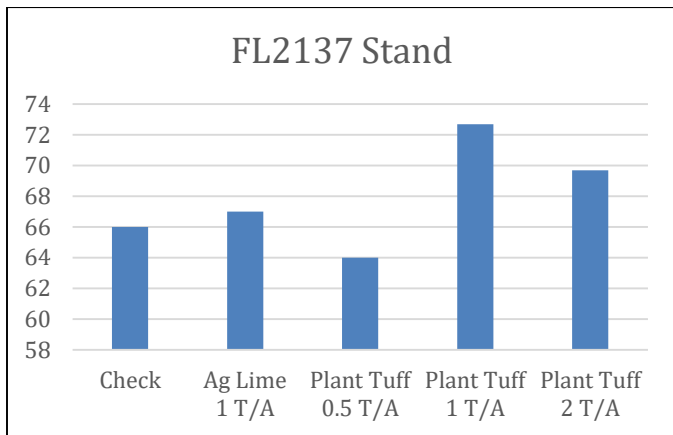


Table 2. Emergence, Vigor, Canopy and Yield for FL2137 (CWT)

Treatment	Rate	Stand	Stand	Vigor	Canopy	Yield US-1	Yield BCWT	Yield Total	Yield Number US-1	Yield Number B
Check	0	60.1	66	1.5	57.5	441.7	47.7	489.4	57397	12534
Ag Lime	1.0	61.4	67	1.5	65.8	426.4	56.9	483.3	55655	15712
Plant Tuff	0.5	55.8	64	1	93.3	419.2	51.2	470.4	53502	14143
Plant Tuff	1.0	61.8	72.7	1	95	432.5	46.1	478.6	57089	12702
Plant Tuff	2.0	58.7	69.7	1	89.2	476.1	54.3	530.4	60369	17279



Results:

Broadcast soil applications of Plant Tuff Silicon Fertilizer were evaluated on two potato varieties: Russet Norkotah, a variety popular in the fresh market and French fry market, and a Frito Lay variety FL2137, which is used in the chip market. Treatments included Plant Tuff Silicon Fertilizer applied at 0.5, 1.0, and 2.0 tons per acre, Ag Lime applied at 1 ton per acre, and an untreated check. All treatments were applied in the early spring prior to planting.

The data was statistically analyzed as a complete strip-block design with the potato variety as the strip factor. Potato emergence was not significantly affected by any of the treatments. This is likely due to the soil type and environmental conditions following planting. There was a significant interaction between variety and treatment so the variety's response to treatments were looked at individually.

Trends observed in Plant Tuff's 2015 evaluation of Plant Tuff Silicon Fertilizer were seen again in 2016. These trends included total yield per plot and total number per plot of FL2137 trending upward as the rate of Plant Tuff Silicon Fertilizer was increased. Similarly, the FL2137 potatoes in the 2 T/A Plant Tuff application had the greatest weight of larger potatoes as well as a greater total number of potatoes when compared to Ag Lime treatments, untreated check, and lower rates of Plant Tuff treatments.

Plots of Russet Norkotah and FL2137 both showed increasing rates of Plant Tuff Silicon Fertilizer leading to significantly increased canopy coverage. The increase in canopy coverage means the rows closed more quickly due to increased leaf area. This increased leaf area provided greater potential for photosynthesis, leading to more carbohydrates and enhanced plant growth and fruit set. There was also a positive trend in total yield as the rate of Plant Tuff Silicon Fertilizer increased. This positive trend was observed at the 0.5, 1.0, and 2.0 T/A application rates. Plant Tuff treated plots increased the weights and size of the US-1 grade potatoes as well as increased the total number of potatoes in all three Plant Tuff treatments as compared to Ag Lime and the untreated check.

2016 is the second year of replicated trails in potatoes for Plant Tuff Silicon Fertilizer. It is currently theorized that a fall application of Plant Tuff Silicon Fertilizer would allow the soil microbial population to break down the Plant Tuff Silicon Fertilizer in the fall, therefore providing available Si and other nutrients for early plant growth in the spring. Potatoes set their number of tubers during a specific range of growth. Having the nutrients from Plant Tuff Silicon Fertilizer available earlier in the growth season would help to promote early potato plant growth and, therefore, greater yields. The positive response of Plant Tuff Silicon Fertilizer applied to these two different potato varieties suggests that the product has a good fit in potatoes.