

Plant Tuff Winter Wheat Trial 2015-2016
Mid-Michigan Agronomy, LLC
Dewitt, MI

Objective: To evaluate the effect of Plant Tuff Silicon Fertilizer on the growth and yield of winter wheat.

The variety Branson was planted. Branson is a disease resistant winter wheat cultivar from Syngenta. Branson was selected because it represents many of the new wheat varieties that are more resistant to plant stresses caused by bacterial and fungal soil borne and foliar diseases. Treatments were broadcast over plots at the desired use rates in early spring prior to spring wheat growth. Wheat canopy green area measurements were recorded twice, on June 1st and June 16th, 2016. These measurements estimated the density of the wheat canopy and would be an indication of the level of light interception and photosynthetic activity. Wheat yields were determined on July 12, 2016.

Location: Dewitt, MI
Soil Type: Silty Clay Loam

Planting Date: 11/17/2015
Emergence Date: 11/25/2015
Application Date: 4/02/2016
Harvest Date: 7/12/2016
Variety: Branson

Pre-Treatment

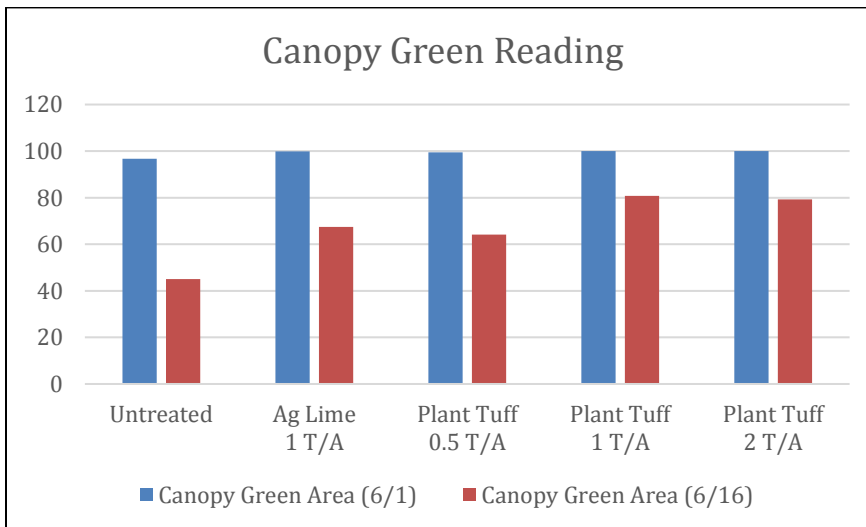
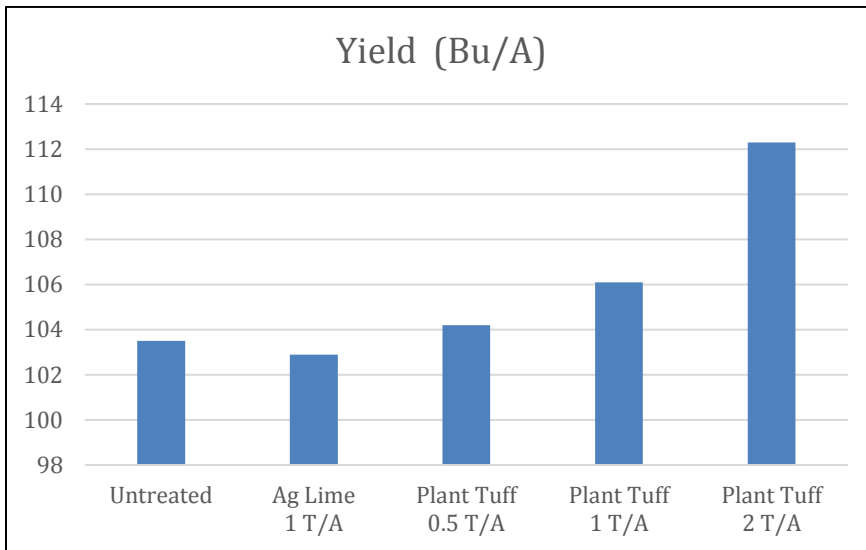
Si Range: 83-180 ppm
Si Average: 116 ppm
Si Outlier: None
Soil pH: 6.5

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. Effect of Plant Tuff Applications on Winter Wheat Yields

Treatment	Rate (T/A)	Canopy Green Area (6/1)	Canopy Green Area (6/16)	Yield (Bu/A)	Test Weight (lbs./bu.)
Untreated	0	96.7	45.0	103.5	60.2
Ag Lime	1	99.9	67.5	102.9	59.8
Plant Tuff	0.5	99.4	64.2	104.2	60.4
Plant Tuff	1.0	100.0	80.8	106.1	60.9
Plant Tuff	2.0	100.0	79.2	112.3	60.0



Results:

Spring applications of Plant Tuff Silicon Fertilizer on winter wheat were evaluated for their effect on wheat growth and yield. Plant Tuff Silicon Fertilizer was compared to Ag Lime at 1 T/A and an untreated check. Plant Tuff Silicon Fertilizer applied at 0.5, 1, and 2 tons per acre had a significantly greater green canopy at the second evaluation date as compared to the untreated check. This is likely the result of improved soil conditions attributable to the Plant Tuff treatments. Results also suggest that wheat treated with Plant Tuff Silicon Fertilizer had more tillering and greater leaf area than either the Ag Lime or the untreated check. The greater leaf area caused by Plant Tuff Silicon Fertilizer enabled the wheat plant to intercept more sunlight and have a greater level of photosynthesis. The enhanced photosynthesis produced more plant carbohydrates, leading to greater wheat yields.

The initial soil pH of this field was 6.5. The Ag Lime treatment adjusted soil pH toward a more basic level, decreasing the availability of many plant nutrients. Plant Tuff Silicon Fertilizer, however, is self-buffering and did not tend to increase the soil pH beyond 7.0, maintaining the availability of plant nutrients. Plant Tuff Silicon Fertilizer applied at 1 and 2 tons per acre trended toward increased wheat yields as compared to the Ag Lime and the untreated check. Yields increased by 3.2-9.4 bu/A for Plant Tuff Silicon Fertilizer applied at 1 T/A and 2 T/A respectively as compared to the Ag Lime treatments. Similarly, yields increased by 2.6-8.8 bu/A for Plant Tuff Silicon Fertilizer applied at 1 T/A and 2 T/A respectively as compared to the untreated check.

The increase in wheat yield from Plant Tuff Silicon Fertilizer may be related to the increase in the green area of the wheat canopy. Yield increases may also be related to the ability of the wheat plant to manage biotic (disease or insect) stresses and abiotic (high temperature or drought) stresses that the wheat was exposed to during the growing season. The winter wheat variety, Branson, was planted and evaluated. Branson is resistant to many of the diseases common to wheat. The lack of stress from foliar diseases, due to the variety selection, may have affected the stress management from the Plant Tuff application. There are still other biotic stresses that negatively affect yield, which the silicon in Plant Tuff Silicon Fertilizer helped to manage. There were abiotic stresses throughout the season that were managed through the plant-available silicon applied as part of the Plant Tuff Silicon Fertilizer treatment.