



Soil Amendment and Foliar Application Trial 2016 Full Report

Overview:

This report summarizes Ohio State Soil Fertility Lab’s efforts of a third party evaluation of proprietary soil amendments and foliar applications products aimed at improving the mineral nutrition and productivity of crops. This service intends to provide timely and unbiased information on these products for farmers. In 2016, we tested submitted products from the following companies:

- 1) AgZyme® by Ag Concepts: <http://agconcepts.com/products/agzyme/>
- 2) BAM-FX by Zero Gravity Solutions: <http://bamagsolutions.com/>

Corn Results

Table 1. Soil Properties of the Three Corn Sites Before Application of Product.

County	pH	CEC	OM	P	K	Ca	Mg	S
		cmol/100g	(%)	----- ppm -----				
Clark	6.8	15.9	2.2	27	123	2277	553	9
Wayne	6.6	7.6	1.6	26	149	1342	206	11
Wood	6.8	16.0	2.6	62	199	2600	440	11

Table 2. Corn Grain Yields for All Sites.

Treatment	Grain Yield (bu/acre)		
	Clark	Wayne	Wood
Control	--	105.7	--
BAM-FX	--	104.5	--
Least Significant Difference		13.9	

Interpretation: No treatment yielded significantly greater than the control.

Soybean Results

Table 3. Soil Properties of the Three Soybean Sites Before Application of Product.

County	pH	CEC	OM	P	K	Ca	Mg	S
		cmol/100g	(%)	----- ppm -----				
Clark	6.6	12.1	1.8	22	119	1728	520	8
Wayne	6.7	9.0	2.0	23	133	1449	248	10
Wood	6.4	16.9	2.6	39	209	2755	371	11

Table 4. Soybean Grain Yields for All Sites.

Treatment	Grain Yield (bu/acre)		
	Clark	Wayne	Wood
Control	71.2	37.4	67.1
AgZyme	68.1	43.3	65.4
BAM-FX	--	43.6	--
Least Significant Difference	3.7	10.7	2.6

Interpretation: At all three sites, no treatment yielded significantly greater than the control.

Conclusions

Across all three sites, no consistent trends were found with any of the tested products. No product significantly affected a measured property at more than 1 site. For both corn and soybean, no product treatment yielded significantly greater grain than the untreated control. As a result, only corn and soybean grain yields are reported here. This is only one year of field data, so interpretations should be made with caution, especially considering the dry weather encountered in the 2016 field season.

More information can be found: <http://go.osu.edu/SAFA>

Please contact Steve Culman for more information: culman.2@osu.edu

Methods:

Field Operations

Corn and soybean plots were planted at three sites on Ohio State University Research Farms (**Clark County** at the Western Agricultural Research Station in S. Charleston, **Wayne County** at the Ohio Agricultural Research and Development Center in Wooster and **Wood County** at the Northwest Agricultural Research Station in Custar). A randomized complete block design was implemented at each site with four replications. Sites were managed conventionally using best management practices and fertility followed the Tri-State Recommendations. Fields at all three sites have followed a corn-soybean rotation. Corn and soybean planted this year continued with that respective rotation pattern. All plots were 10 feet wide (4 rows of 30-inch corn, 7 – 8 rows of 15-inch soybean). Plot lengths for both crops were 40 feet in Clark and Wood Counties and 30 feet in Wayne County. Products were applied as instructed on the registration forms.

Clark County. No P or K fertilizer was applied this year and both crops were planted no-till. For corn, Seed Consultants hybrid SCS1066AMX was planted on May 24th at 33,000 seeds per acre. All plots were side-dressed with 28% UAN on June 21st (total N rate 180 lbs/ acre) and corn was harvested on October 26, 2016. For soybeans, Pioneer variety P34T072R was planted on May 25th in 15-inch rows at 175,000 seeds per acre and harvested on October 14, 2016.

Wayne County. A spring surface broadcast of K was applied to both crops with 150 lbs. K₂O/ acre on all corn plots and 200 lbs. K₂O/acre on all soybean plots. Both crops were planted no-till. For corn, Seed Consultants hybrid SCS10HQ34 was planted on May 25th at 33,000 seed per acre. Side-dressing of 28% UAN occurred on June 27th (total N rate 180 lbs/ acre) and corn was harvested on October 29, 2016. For soybean, Seed Consultants variety SCS9314RR was planted on May 27th in 15-inch rows at 175,000 seed per acre and harvested on October 14, 2016.

Wood County. No P or K fertilizer was applied at this site. For the corn plots, the field was tilled in the fall of 2015 with one pass of a disk and one pass of a field cultivator. Pioneer hybrid P0506AM was planted on May 20th at 34,000 seeds per acre. Side-dressing of 28% UAN occurred on June 14th (total N rate 180 lbs/ acre) and corn was harvested on October 31, 2016. For soybean plots, tillage also occurred in the fall of 2015 with two passes of a disk. Pioneer variety 31T11 was planted on May 23rd in 15-inch rows at 175,000 seeds per acre and harvested on September 10, 2016.

Data Collection:

1. **Complete soil sample analysis prior to planting.** Soil samples were collected by using a 7/8 inch push probe to composite eight, 8-inch soil cores from each plot. Soils were air-dried and sent to Spectrum Analytic for an S3 complete soil test: spectrumanalytic.com
2. **Initial stand counts at V5 for corn and soybean.** Initial stand counts were collected for corn plots by counting plants in a 17 feet, 5 inch length (1/1000th of an acre with 30-inch rows) within one of the plot harvest rows. Initial stand counts for soybeans were collected by counting the number of plants in a 6 feet length within each of two harvest rows.
3. **Whole plant sampling at V5 for total biomass and complete nutrient analysis.** Vegetative stage plant samples were collected by clipping 10 plants at ground level from the plot border rows. Plants were oven-dried and weighed for total biomass. Samples were then sent to Spectrum Analytic for nutrient analysis (P2 test).
4. **Leaf sampling at R1 for corn and soybean for complete nutrient analysis.** Reproductive stage corn leaf tissue samples were collected by removing the ear leaf from 10 randomly selected plants. Soybean tissue samples were collected by removing the uppermost fully mature leaf trifoliolate from 12 randomly selected plants. Samples were oven-dried and sent to Spectrum Analytic for processing and nutrient analysis (P2 test).
5. **Final stand counts at maturity.** Final stand counts for corn were collected by counting all plants in the center two harvest rows in each plot. Final stand counts for soybeans were

collected by counting the number of plants within a 6 feet length in each of two harvest rows.

- Harvest grain yield with complete grain nutrient analysis.** Grain was harvested with a small plot combine and moisture was adjusted to 15.5% for corn and 13% for soybeans. A subsample of grain was oven-dried and sent to Spectrum Analytic for processing and nutrient analysis (P2 test).

2106 Weather Data

More information can be found here: <http://www.oardc.ohio-state.edu/newweather/default.asp>

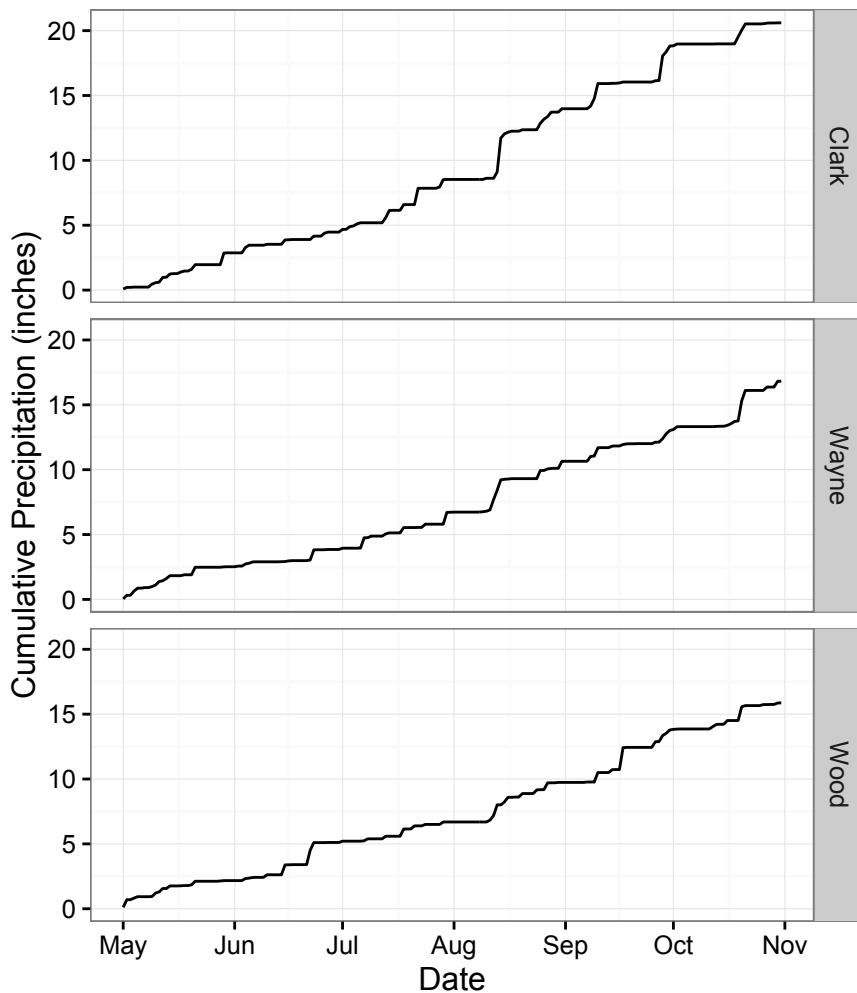


Figure 1. 2016 Cumulative Precipitation at the three field sites from May – November.

Table 1. Cumulative Precipitation (inches) by Month at the three field sites.

Site	May	June	July	August	September	October
Clark	2.9	1.6	4.1	5.5	4.8	1.8
Wayne	2.5	1.3	2.9	3.9	2.4	3.8
Wood	2.2	2.9	1.6	3.1	4.0	2.1

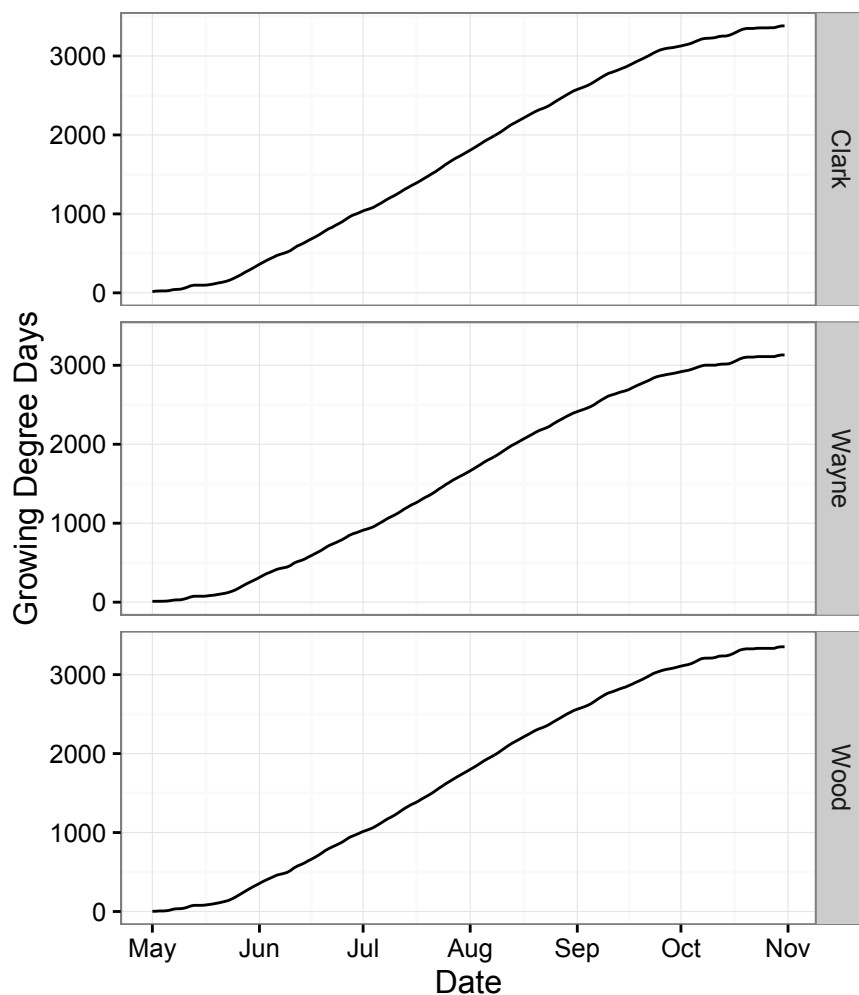


Figure 2. 2016 Cumulative Growing Degree Days at the three field sites from May – November.

Table 2. Average Temperatures (F) by Month at the three field sites.

Site	May	June	July	August	September	October
Clark	61	73	75	76	70	59
Wayne	59	70	74	75	68	56
Wood	60	72	75	76	69	58