

Evaluation of Starter Fertilizers for Field Corn

Andy Kleinschmidt, AGNR Extension Educator- Van Wert County
Gary Prill, Program Manager- Farm Focus Research- Van Wert County

Objective

The objective of this study is to evaluate the yield response of several different starter fertilizer programs and fertilizer placement locations at planting in field corn.

Background

Crop Year:	2008	Herbicide:	
Cooperator:	Farm Focus/Marsh Foundation	PRE (May 23):	Guardsman Max at 4.5 pt/A + Roundup PowerMax at 22 oz/A + + 2,4-D LVE6 at 10 oz/A + AMS at 17 lb/100 gal
County/Town:	Van Wert/Van Wert	Variety:	Brodbeck Seeds SX 708
Drainage:	Nonsystematic tile	Insecticide:	Cruiser 250 on seed, Aztec 2.1 G at 6.7 oz/1000 row ft T-banded at planting
Soil Type:	Hoytville clay, Hoytville silty clay loam, Haskins loam	Row width:	30 inches
Previous Crop:	Soybeans	Planting Rate:	32,000 seeds/A
Tillage:	Fall strip-till	Planting Date:	May 23, 2008
Soil Test (2007):	pH 6.3, P 40 ppm, K 182 ppm	Harvest Date:	October 21, 2008
Fertilizer:	Starter fertilizer- variable, see Methods 120 lb/A nitrogen sidedressed as 28% UAN (June 18)		

Methods

This study intended to evaluate different starter fertilizers was set up as five treatments with four replications of each treatment in a randomized complete block design. Plot size was 30 feet wide by 1,030 feet long. The treatments were:

- 1) Untreated check (95 lb/A 45-0-0 2x2 banded only)
- 2) 136 lb/A 32-9-8 granular fertilizer blend 2x2 banded
- 3) 2-20-18 liquid fertilizer in seed furrow + 95 lb/A 45-0-0 2x2 banded
- 4) 2-20-18 liquid fertilizer + Avail SD in seed furrow + 95 lb/A 45-0-0 2x2 banded
- 5) 2-20-18 liquid fertilizer + sugar and biological additive in seed furrow + 95 lb/A 45-0-0 2x2 banded

The liquid starter fertilizer treatments were applied in the furrow directly behind the dropped seed at a rate of 5.5 gallons per acre. The Avail SD phosphorus fertilizer enhancer was blended in with the 2-20-18 liquid fertilizer at a rate of 0.5% prior to application in the seed furrow. The sugar and biological additives were blended with the 2-20-18 liquid fertilizer at a rate equivalent to 1 pt/A for each product. The granular fertilizer blend supplied equivalent amounts of nitrogen, phosphorus, and potassium as compared to the 2-20-18 blends with the 45-0-0 urea 2X2 banded. The placement of the dry fertilizers (2X2 banded) was 2 inches to the side and 2 inches below the seed. All plots also received 120 pounds of nitrogen per acre from 28% UAN sidedressed with a coultter/injector applicator on June 18 when corn was at the V4 stage of growth.

Harvest populations (October 17 & 21) were estimated by counting the number of plants with harvestable ears on each side of a 17 feet 5 inch measured distance at 3 different locations in each plot. The average of the number of plants per 17 feet 5 inches was converted to plants per acre. The plots were harvested with a John Deere 6620 combine equipped with a calibrated AgLeader PF3000 yield monitor. Yields were calculated from grain weights measured with a calibrated weigh wagon. Moistures were taken from the combine yield monitor average moisture reading for each plot. All yields were adjusted to 15% moisture.

Results

Table 1. Harvest population, moisture, and yield means for each treatment.

Treatment	Harvest Population	Moisture	Yield
	(plants/A)	(%)	(bu/A)
Untreated check (Urea only)	28,500	16.7	123.8
32-9-8 granular fertilizer blend	30,000	16.8	127.3
2-20-18 blend	29,500	15.9	131.5
2-10-18 blend + Avail SD	29,400	16.3	130.0
2-20-18 blend + sugar + bio	28,700	16.5	126.1
	LSD (P=0.05)	NS	NS
	F-test	1.5	< 1
	CV (%)	3.5	5.1

NS= not significant

Summary

The results from this one year study did not show any statistically significant differences in harvest population, moisture, or yield for any of the starter fertilizer applications over the untreated check plot. This is the second year for a study looking at starter fertilizers on corn at Farm Focus. The 2007 study looking at several different liquid fertilizer assays also showed no significant difference between the treatments and the untreated check. Results of this study can be accessed on the Farm Focus website at (http://farmfocus.osu.edu/corn_pop-up_fertilizer-07.pdf).

Soil tests taken in fall of 2007 for the 2008 test field showed phosphate levels at 40 ppm, and potash levels at 182 ppm with a CEC of 19 meq/100g. According to the Tri-State Fertility Recommendations (bulletin E-2567) critical soil test levels for phosphorus and potassium (at 19 CEC) are 15 ppm and 125 ppm respectively. As such additional phosphorus and potassium are not required to produce a high yielding corn crop at the soil test levels measured in the study field. The 2007 study field also had phosphorus and potassium concentrations well above critical soil test levels. Both studies would indicate that even small amounts of phosphorus and potassium in a starter fertilizer blend are not likely to increase yields if a field is not calling for additional phosphorus and potassium.

For more ingredient information on the proprietary blend of 2-20-18 fertilizer, sugar, and biological additives contact P & L Fertilizer at (419) 968-2230. Avail SD is a product from

Specialty Fertilizer Products that according to the manufacturer reduces tie-up of phosphorus in the soil making it more available for absorption by the plant.

Acknowledgements

OSU Extension- Van Wert and Farm Focus express appreciation to P & L Fertilizer for supplying the liquid fertilizer blends and additives tested. Thanks also to Brodbeck Seeds for supplying the seed, and to BASF, Monsanto, and Bayer CropSciences for supplying the herbicides and insecticide used in this study.

For additional information contact:

Gary Prill
1055 South Washington Street
Van Wert, OH 45891
419-238-1214
prill.1@osu.edu



Ohio State University Extension embraces human diversity and is committed to ensuring that all research and related educational programs are available to clientele on a nondiscriminatory basis without regard to race, color, religion, sex, age, national origin, sexual orientation, gender identity or expression, disability, or veteran status. This statement is in accordance with United States Civil Rights Laws and the USDA.

Keith L. Smith, Ph.D., Associate Vice President for Agricultural Administration and Director, Ohio State University Extension

TDD No. 800-589-8292 (Ohio only) or 614-292-1868