



Issue 433: March 2019

Starter Fertilizers - The Key to Early Season Success

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There are many decisions a farmer needs to make when planning for a successful crop. One of those decisions to make is whether or not to use a starter fertilizer. This can be seen as another “cost” to the grower, but it plays a large role in beginning a successful crop and providing a return on investment in the fall.

Corn plants rely on the seed for nutrients during germination using energy stored in the seed as the radical root emerges. During the VE stage the nodal root system emerges and will serve as the primary way nutrients and water are taken up by the plant. Corn seedlings are very prone to stress during this early development and starter fertilizers contacting nitrogen, phosphorus, and potassium are key to mitigating early season stress. This is especially important if growers are planting into cool wet soils or soils with reduced or no tillage. Starter fertilizers provide a high concentration of essential nutrients within the seed zone to protect the corn plant.

Starter fertilizers can be applied in a variety of ways. In-furrow applications are very popular as well as 2x2 and 2x0 placement in relation to the seed. It is important to understand what types of fertilizer you are applying and avoid using too high of salt concentrations too close to the seed, as it can increase the risk of seedling injury in dry soils and drought prone soils. This chart from the University of Nebraska Extension indicates safe application distances and volumes for starter fertilizer for 30” rows.

Table III. The amount of 10-34-0 that can be safely applied per acre for corn and grain sorghum in 30-inch rows as influenced by distance from the seed and soil texture**. Determine safe application rates for other fertilizers by dividing the value relative to 10-34-0 given in Table II into the amounts listed below.

Placement	10-34-0 (gal/acre)*	
	Sandy soils	Non-sandy soils
With the seed (pop-up)	5	5
1/4 to 1/2 inch from the seed	10	10
1 inch from the seed	20	40
2 inches or more from seed	20+	40+

*The safe application rate for soybeans is one-half of these values.
 **For narrower row-widths, the application rate may be increased. For 22-inch rows, multiply values by 1.36 and for 15-inch rows multiply by 2. Chart courtesy of University of Nebraska Extension

Starter fertilizer can also be a great opportunity to apply micronutrients such as zinc, boron, copper when needed. It is also a great way to apply liquid insecticides to provide additional root zone protection against corn root worm and other pests. Be sure to read the labeled instructions on insecticide compatibility before mixing in with your starter fertilizers to avoid mixing compatibility issues.

How can I calculate the Return on investment (ROI) that starter fertilizers provide?

There is more yield response to starter fertilizers in low soil test soils, mostly P and K. However, all soils can benefit from starter fertilizer in developing the crucial root structure needed in your corn seedlings. Most studies see a 2-3 bushel per acre yield response in corn to starter fertilizers. Let assume 10-34-0 fertilizer is \$450/ton using a 3 gallon per acre rate. This calculates to be a \$2.64 per acre profit and a 33% return on investment as well as a healthier more consistent plant stand.

$$(3 \text{ bpa} \times \$3.50/\text{bpa}) - (\$450 / 2000 \text{ lbs.}) \times (11.65 \text{ lbs.} \times 3 \text{ gallons})$$

\$10.50 - \$7.86 = \$2.64 profit and 33% ROI
1000 acres of corn x \$2.64= \$2,640

Sources

1. <https://fluidfertilizer.org/wp-content/uploads/2016/06/Antonio-Mallarino.pdf>
2. <http://extensionpublications.unl.edu/assets/html/g361/build/g361.htm>

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