



## Most Asked Agronomic Questions

### Bulletin 760

## Chapter 2

### Starter Fertilizers

*Jay W. Johnson*

#### 1. What is the best placement for starter fertilizer?

For both corn and soybeans, the best placement for starter fertilizer usually is 2 inches to the side and 2 inches below the seed. In using this type of placement, be careful that the total amount of salts (N and  $K_2O$ ) does not exceed 100 lb./A for corn or 70 lb./A for 30 inch row soybeans. If the salt index is greater than these critical levels, you should increase the seeding distance. Using a starter placement closer than 2 X 2 inches may result in reduced germination or salt injury to the seedling.

#### 2. Will starter fertilizer banded over the row behind the planter press wheel be effective?

The N portion of a starter fertilizer usually is effective if banded over the press wheel. This element is very mobile in soil. It can easily move from the band downward into the soil profile, thereby contacting the growing roots of the new seedlings.

P and K, on the other hand, are considered immobile elements in the soil. When these nutrients are banded over the press wheel, uptake is often inefficient because absorption can only occur if the seedlings' roots grow up to the surface band.

#### 3. How much starter fertilizer should I use?

The amount of starter fertilizer that is needed depends on three factors: the soil test levels of P and K, the crop to be grown, and the climatic conditions of the area.

If at least 20 lbs.  $P_2O_5$  and 20 lbs. of  $K_2O$  per acre are applied with the planter as a starter fertilizer, reduce annual recommendation accordingly.

#### 4. What is the ideal starter program for corn?

Any starter program must be based on a specific farming situation. In particular, one must take into consideration the present availability of soil nutrients as well as other specific soil properties and weather

conditions. No one starter program will be appropriate for all situations. In every case, however, the goal of a starter fertilizer will be to provide adequate N, P, and K for the early vigorous growth of the seedlings.

### **5. Do soybeans need fertilizer at planting?**

Our research shows that for soybeans a broadcast application of fertilizer is just as effective as a row starter.

Reference: "Effect of Applied and Residual P and K on Soybeans," 1984 Soil Fertility Research

### **6. What are the benefits of placing a complete fertilizer solution with the seed as a pop-up on no-till? How much can you use and not hurt germination?**

When a fertilizer solution is used as a "pop-up" application, it tends to scarify the seeds and thus can cause them to germinate a little faster than normal.

Nevertheless, placing fertilizer directly on the seed may cause seedling damage; as a result, reduced rates of germination are often seen when "pop-up" fertilizers are used. Some risk is always present, even when small amounts of fertilizer are used. It is hard to predict whether the benefits of a pop-up will outweigh the risks.

### **7. How important is potassium in a starter band if a broadcast application has been made?**

On soils with a high capacity for K fixation, row applications of 40 lbs./A of  $K_2O$  are recommended whenever the soil test is low or medium.

Our research has shown that starter K is needed for corn if the soil test level of K is low and if the broadcast treatment is not incorporated under low residue conditions.

For soybeans we have not been able to demonstrate a difference between starter bands and broadcast applications of K.

### **8. Do I need a starter fertilizer for corn if the soil test is high in P and K?**

On soils testing high for P and K, we have not been able to demonstrate a need for starter fertilizer containing these elements. In general, Ohio soils warm up early enough in the spring that there is adequate release of these nutrients, and thus good early growth of seedlings results even without the use of starter P and K.

Nevertheless, research data from Wisconsin has shown that on soils that tend to be cold and wet during early spring, the use of starter P and K can be of benefit, even when the soil test levels of P and K are high. In northern Ohio where seedling growth is sometimes delayed by cool, wet conditions, starter P and K may also be of some benefit. In addition, on high clay content lakebed soils, there has been found to be a much higher efficiency of K, which is placed in the row, as compared to broadcast applications.

### **9. If P and K are high (and a starter fertilizer is not needed), how do I get the starter N in?**

There are several pure nitrogen sources that can be used as starter fertilizer: 28% U.A.N.,  $NH_4NO_3$ ,  $(NH_4)_2SO_4$ , and urea.

### **10. How much nitrogen should be applied per acre as starter for conventional and no-till corn**

## **and/or soybeans?**

The rate of starter N to use for corn depends upon the total N program that is adopted. Usually when a broadcast or pre-plant program is employed, it is recommended that only a small amount of N be included in the starter. When most of the N will be applied as a side-dress, a little more N should be used in the starter program. As a rule of thumb, 20-30 lbs. N/A is recommended for use as a starter with conventionally tilled corn while 20-50 lbs. N/A is recommended for no-till corn.

We have not been able to demonstrate a need for the use of starter N with soybeans grown in Ohio.

### **11. If a micronutrient such as zinc is recommended, how much will be needed in a starter band to equal the broadcast rate in performance? How does chelate or polyphosphate sequestered zinc compare with inorganic zinc?**

When using zinc salt ( $ZnSO_4$ ) as the zinc source, apply 1/10 the rate in a starter band to equal the recommended broadcast rate.

Zinc chelates are often not the preferred product for use in Ohio because of their typically higher cost; the exception to this is that they must be used if a liquid starter program is chosen. Substances in the liquid starters can react with  $ZnSO_4$  to form Zn compounds, which are unavailable for plant uptake.

### **12. What should be the starter band rate of S and micronutrients compared to broadcast?**

Since sulfur ( $SO_4^{2-}$ ) is very mobile in the soil, the same rate of it can be used in a starter band as would be used in a broadcast application.

### **13. Concentrated liquid starters are popular in our area ( NaChurs, Alpine, First, P & L etc.). These companies claim that 10 gallons of 9-18-9 will supply all of the $P_2O_5$ necessary for corn, because 100% of the $P_2O_5$ is available to the crop the year it is applied. Customers pay a premium for concentrates. Do concentrates perform agronomically better than any other row starter? Are their claims justified?**

Due to their low salt content, use of concentrated liquid starters may be of benefit on soils with high salt buildup. On the humid soils of the Midwest, however, salt buildup is generally not a problem. On these soils, the concentrated liquid starters have been found to be no better than traditional 9-18-9 fertilizers. Thus, the claims of improved nutrient availability for liquid starters appear to be unjustified.

Reference: "Compendium of Research Reports on Use of Nontraditional Materials for Crop Production," NCR #103 Committee

### **14. Is liquid fertilizer better than dry fertilizer for corn as a starter fertilizer?**

Liquid and dry fertilizers are of equal value/lb. of fertilizer nutrient.

### **15. Is manufactured fertilizer better than blended fertilizer for a corn starter?**

Because a manufactured fertilizer has its product (N,P,K) combined in each pellet, it probably allows for a more even distribution of applied nutrients in the soil than does a blended fertilizer. Plants, however, are able to absorb nutrients from a zone of soil surrounding their root systems. Thus, from the practical stand point of plant uptake of nutrients, there is little difference between blended and manufactured fertilizer. Both types of fertilizers should result in equally adequate plant nutrition.

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