

## Starter Fertilizer for Summer Crops

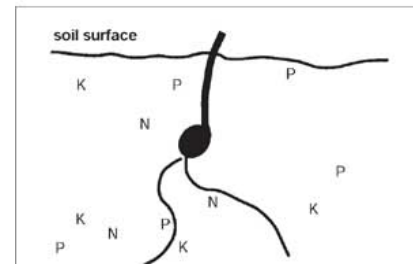
Starter Fertilizers are put down at planting and can be placed in contact with the seed, 1" away, or 2" down and 2" away (2 by 2). This is a great way to apply fertilizer, especially the immobile nutrients phosphorous (P) and potassium (K), but there are a few considerations and cautions should be taken.

Placing the immobile nutrient in a concentrated zone close to the seed is in most cases a better than broadcast incorporation. Many reports have shown that the recommended fertilizer P and K rate can be reduced when it is banded. Phosphorous is the best example of a good nutrient to band as a starter. Phosphorous fertilizer quickly reacts to elements in the soil and within a year's time of application most of what hasn't been removed by the plant has been bound up by calcium, aluminum, or iron. When placed in a concentrated zone the P does not react as quickly with the soil and is available for a longer period. Several studies have also shown the benefit of having starter P even when soil test are at or above 100% sufficiency. This benefit is primarily seen with early planted corn and sorghum. In cool wet soils root growth is slowed and having a concentrated band of P near the seed boost root and shoot growth.

Now the considerations and cautions, when placing fertilizer near the seed there could be a possibility of salt injury. Nitrogen, potash, and sulfur can injure the seed while any amount of phosphorous can be added with no problem. Some plants are more tolerant to this than others  
Rye > Winter Wheat > Sorghum >> Corn > Soybean.  
It is not recommended to put more than 10 lbs of nutrient with the seed, 5 to 6 lbs is a better choice (5 gallon of 10-34-0 / acre). To figure this amount you add the amount of N and K and ½ S added per acre.

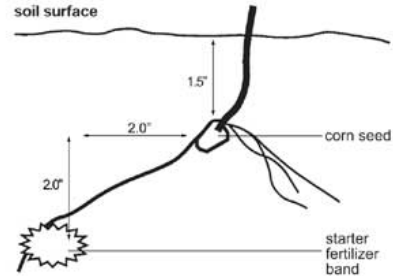
For most of situations Oklahoma producers will only worry about the N content of the fertilizer. The amount of N can be increased as the fertilizer is placed further away from the seed. One last caution is when using Urea (46-0-0) and DAP (18-46-0). The N in these two sources is converted to NH<sub>3</sub> before being absorbed to the soil. Ammonia (NH<sub>3</sub>) is harmful to the seed and placing Urea and DAP in contact with seed should be done with caution and at low rates. Sandy soils are more susceptible to injury than clayey soils. When starter is placed in a 2 by 2 band the total N, K, ½S load can be up to 20 lbs in sandy soils and 50 in clayey.

Figure 1. A seedling root system cannot acquire needed nutrients from the bulk soil.



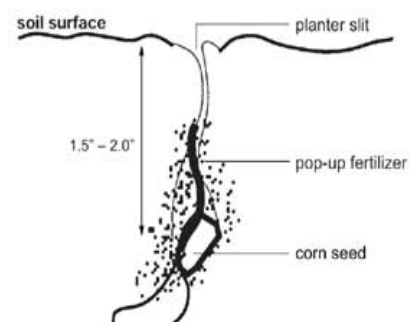
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Figure 3. Diagram of most effective starter fertilizer placement for corn. Seed should be planted about 1.5 inches below the soil surface. The fertilizer band should be placed 2 inches beside and 2 inches below the seed so that developing roots can easily obtain necessary nutrients, but not cause injury to seedling.



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Figure 4. Pop-up fertilizer placement in relationship to a germinating corn seed.



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