



GUIDELINES FOR USING BANDED FERTILIZER FOR CORN

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Higher fertilizer prices have stimulated many crop producers to thinking about management practices that will reduce fertilizer cost without reducing yield. Using banded fertilizer at planting for corn is one of those practices. In the past, banded fertilizer was usually considered to be a “starter” where fertilizer was placed 2 inches to the side of and 2 inches below the seed at planting. Times have changed. Use of a banded fertilizer is important. However, the placement of the band can be positioned at several locations. The term, “starter fertilizer” is disappearing from the fertilizer vocabulary.

Fertilizer use guidelines from the past have suggested that rates of phosphate and or potash needed for optimum production can be halved, compared to broadcast applications, if those nutrients are applied in a band near the seed and soil test values are in the low and very low ranges. For corn, the rates are adjusted for soil test levels of both P and K. These suggestions are listed in Tables 1 and 2.

Table 1. Suggested rates of banded phosphate for corn grown in conventional tillage systems.

Expected Yield	Bray:	Soil Test P (ppm)				
		<u>very low**</u>	<u>low</u>	<u>medium</u>	<u>high</u>	<u>very high*</u>
	Olsen:	0-5	6-10	11-15	16-20	21+
		0-3	4-7	8-11	12-15	16+
bu./acre		- - - - -	- - - - -	P ₂ O ₅ to apply (lb./acre)		- - - - -
less than 100		30	20	20	10-15	10-15
100-124		40	25	20	10-15	10-15
125-149		45	30	25	10-15	10-15
150-174		50	35	30	10-15	10-15
175-199		55	40	30	10-15	10-15
200+		60	45	35	10-15	10-15

* No phosphate fertilizer is suggested if the soil test P is higher than 25 ppm (Bray) or 20 ppm (Olsen) and the crop rotation is not continuous corn.

** For the very low soil test level, banded phosphate should be combined with broadcast applications. See BU-06240-S, *Fertilizer Recommendations for Agronomic Crops in Minnesota* for more details.

Table 2. Suggested rates of banded potash for corn grown in conventional tillage systems.

Expected Yield	Soil Test K (ppm)				
	<u>very low</u> ** 0-40	<u>low</u> 41-80	<u>medium</u> 81-120	<u>high</u> 121-160	<u>very high</u> * 161
bu./acre	- - - - -	- - - - -	K ₂ O to apply (lb./acre)		- - - - -
less than 100	30	20	20	10-15	10-15
100-124	40	25	20	10-15	10-15
125-149	45	30	25	10-15	10-15
150-174	50	35	30	10-15	10-15
175-199	55	40	30	10-15	10-15
200+	60	45	35	10-15	10-15

* No potash fertilizer is suggested if the soil test for K is 175 ppm or higher.

** For the very low soil test level, banded potash should be combined with broadcast applications. See BU-06240-S, *Fertilizer Recommendations for Agronomic Crops in Minnesota* for more details.

Broadcast applications of phosphate and/or potash are not suggested when soil test values are in the very high range. Relatively low rates of these fertilizer materials are suggested if applied in a band (row application). Although this placement may not guarantee higher yields when soil test values are high, this practice may reduce the risk of having reduced yields in some years (primarily when spring weather is cold and wet).

When banded fertilizer is placed near the seed, the early increase in corn growth is primarily the result of the combination of nitrogen and phosphate. For non-sandy soils and conventional tillage systems, the potash and other nutrients such as zinc may not be that important if soil test values for K and Zn are in the very high range. For sandy soils, sulfur should be added to the banded fertilizer. This nutrient is most effective for corn production if applied in a band at the time of planting.

There is a limit to the amount of fertilizer that can be applied close to the seed at planting. Phosphate has not been shown to have a negative effect on germination. There are concerns, however, about rates of nitrogen, potash, and sulfur (if 12-0-0-26 is used).

In general, as the rates of suggested potash increase, the distance between seed and fertilizer should increase. So, if high rates of potash are suggested, plan to place the fertilizer so that there is at least 1 inch of soil between seed and fertilizer. The use of 10-34-0 is a good choice for placement close to the seed when soil test values for K are 160 ppm or higher in conventional tillage systems.

There are specific production situations where banded application of fertilizer is especially important for corn production. Use of a banded fertilizer has a positive impact on production for the corn following corn crop sequence. In this production system, early corn growth is frequently hampered compared to early growth in a corn-soybean rotation. This reduction in early growth is usually attributed to lower soil temperatures associated with higher amounts of crop residue near the soil surface. Banded fertilizer at planting, regardless of soil test values for P, can be used to overcome this problem.

Banded application of fertilizer at planting is a key management practice for achieving optimum yields in ridge-till, strip-till, and no-till planting systems. With these planting systems, the banded fertilizer is applied in the fall of the previous crop year. Since the location of the band is known, the subsequent corn crop can be planted directly above the existing band.

For these planting systems, rates of suggested phosphate and potash are adjusted for soil test levels of P and K. When considering phosphate, the rates suggested for banded placement in conventional tillage systems are appropriate.

In contrast to phosphate, higher rates of potash are needed for banded application in conservation tillage production systems. If the soil test for K is in the range of 120 to 160 ppm in these systems, an annual application of 40 lb. K₂O per acre is suggested. If the soil test for K is less than 120 ppm, an annual application of 80 lb. K₂O per acre is suggested. Annual applications of banded phosphate and potash are suggested when corn follows corn. In a corn-soybean sequence, the banded phosphate and potash can easily be applied in the fall of the soybean year and the suggested rates can be doubled and applied for two years of production.