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## STARTER FERTILIZER – WHY IT'S DONE

**Starter fertilizer.** It's not the easiest practice to put into place – special attachments, more cost, and logistics of tending tanks or bins to name a few. But many farmers make it a part of their regular planting practices. Why?

**First, with starter fertilizer, a little goes a long way.** Because it is placed near the seed at planting, it is accessible to a young root system. For some crops, like corn and wheat, roots take up nutrients at the fastest rate early in the season. A concentrated supply of nutrients within easy reach of a limited root system increases the chances that roots can continue to take up nutrients at a rapid rate without running short. Because they are strategically placed and timed, starter fertilizers are one of the more efficient applications made.

**Starter fertilizers can be used as a strategy for managing within-field nutrient variability.** It has been shown time and again that soil fertility varies across the field and so does crop response to applied nutrients. Agriculture is able to measure and document this variability more than in the past. However, site-specific approaches still carry risk that some areas of the field may not be properly characterized and under-fertilized. Applying a small quantity of nutrients across the entire field as starter fertilizer helps manage this risk.

**Nutrients in starter fertilizer provide synergistic effects.** Nitrogen and P can cause roots to proliferate in the zone where starter fertilizer was applied. Potassium does not proliferate roots, so co-application with N and/or P is needed for roots to more fully explore the K supply in the starter. Nitrogen, in the ammonium form, results in acidification of the zone of soil right around the root. This lower acidity has been shown to increase P uptake by young plants. Phosphorus also supplies needed energy early in the plant for the active uptake of K.

**The most commonly observed effect of starter fertilizer is more rapid early season growth.** While this response is probably the most visually striking, it does not necessarily mean that a yield response will occur. As a plant continues to develop and its roots explore more soil, starter fertilizer supplies progressively less of the total nutrients taken up, making nutrient supplies elsewhere in the soil profile more important. End of season yield responses depend on how quickly and to what extent a plant root system accesses these other supplies. Under conditions where root exploration is limited or slowed, yield responses are more likely. This holds true as well when soils are less fertile.

**Many would argue that when striving to achieve consistently higher yields, a starter fertilization program should be seriously considered.** Whether or not it fits a particular farm depends on many things beyond those strictly agronomic. However, starter fertilizer does provide some level of insurance against nutrient variability and adverse growing conditions and is a management practice with a rather extensive body of scientific studies supporting its use.

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Abbreviations: N = nitrogen; P = phosphorus; K = potassium.