

AGRONOMIC ALERT



Sidedressing Corn

Corn planting progress this spring has been favorable. However, unsuitable field conditions last fall allowed for little, if any, fertilizer application. As a result, much of the nitrogen (N) fertilizer was applied pre-planting or will be sidedressed this spring. Sidedressing provides the crop with N closer to when it is needed. Growers should be aware of sidedress management options and injury concerns as they sidedress N this spring.

Timing of Sidedressing

If no nitrogen was applied at planting or before, then sidedress applications should be made early (by V3) to meet the needs of developing seedlings. At the V3 growth stage, seedlings have used up nutrients stored in the seed and are increasingly dependent on soil supplied nutrients. The nodal root system is developing at this stage and will soon surpass the seminal roots as the primary root system. When supplementing previous N applications, sidedressing can be done through V8. Adequate N from V5 through V8 is critical due to the number of potential ears and ear girth being determined. Additionally, nitrogen uptake is greatest from V8 through silking, depending on weather conditions (Figure 1).¹

Sources of Nitrogen

Urea-ammonium nitrate (UAN) and anhydrous ammonia are good nitrogen fertilizers to use when sidedressing corn.

Urea-Ammonium Nitrate. UAN liquid solutions, such as 28% or 32% N, can be applied as a band on the surface with drops, even on fairly large corn or by injection. When applying N, especially as UAN or other sources containing urea, remember that it needs help getting into the soil profile before much is lost to volatilization. This is generally done by rainfall or light tillage, depending on the situation. Up to 30% of the urea could be lost due to volatilization if no rainfall occurs within two weeks and temperatures are warm. Injecting UAN into the soil is the most effective way to apply UAN.

Anhydrous Ammonia. Anhydrous ammonia applications should be made in moist soil and only if excess root pruning will not occur. Sidedressing ammonia can begin immediately after planting. Injection between either every row or every other row works.

Benefits vs. Risks

Sidedressing is agronomically more efficient and can help reduce input costs. If over 50% of the N applied is through sidedressing, rates can be 10% less than pre-plant rates.²

Based on early indications of yield potential, N rate can be adjusted with sidedress applications. If the stand is good, and biotech traits and fungicides are being used to protect yield potential, N rates can be increased. Conversely, with poor stands, N rates can be reduced.

Some of the risks associated with sidedressing are a shortage of labor or adverse weather conditions that can delay the application. If the

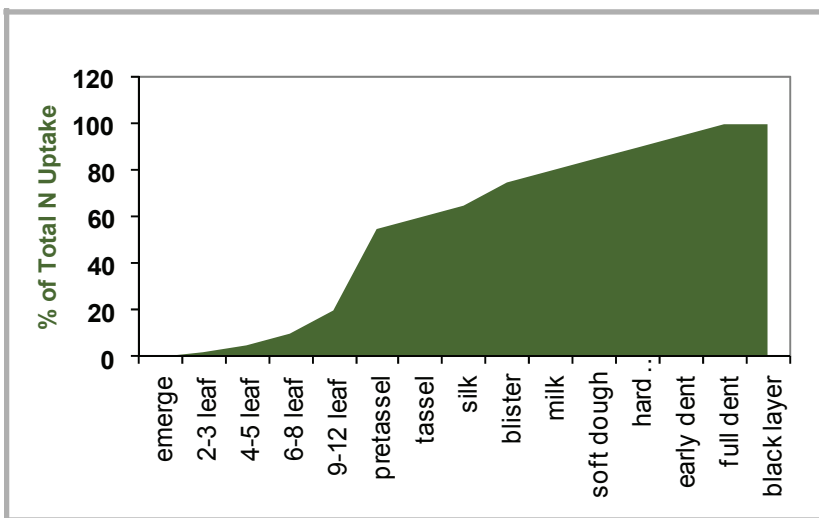


Figure 1. Percent of total nitrogen uptake for corn by growth stage. Nitrogen data adapted from "How a corn plant develops," Special Report 48, Iowa State University.

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crop is deficient of N for an extended period of time, because of delayed sidedress applications, yield potential can be dramatically reduced.

Crop injury is also a concern with sidedress applications. Solution UAN that is applied broadcast has the potential to cause foliar plant burning, leaf loss, and reduced early growth (Figure 2). Because of leaf burning, it is recommended not to exceed 90 pounds of N per acre when corn is at V3 to V4 stage, 60 pounds N at the V7 stage, and not to apply UAN to foliage if plants are larger than V7.³ Hot, dry weather will increase leaf burn and reduce plant growth.

Care must also be taken to avoid injury from sidedressing with anhydrous ammonia. Vapor damage to the corn leaves can occur if ammonia escapes from applicator knives that are close to or above the soil surface. Additionally, wet soil conditions or improper equipment may cause improper sealing of the knife track, which can cause ammonia to escape. When soil is drier, it is easier to seal the knife slot and ammonia is less likely to escape. If only a portion of the corn leaves is damaged, corn plants will usually grow out of the damage. It is recommended to sidedress early with anhydrous ammonia to avoid root pruning by the applicator knives (Figure 3). Corn roots will reach the row middle at a small growth stage.

Please consult your area agronomist if you have questions about sidedressing corn.

Sources: ¹M. Russelle, et al., 1983. Nitrogen accumulation rates of irrigated corn. *Agron. J.* 75:593-598.

²S. Brouder et al., 2003. Nitrogen Fertilizer Management in Good Economic Times and Bad. <http://www.agry.purdue.edu> (5/3/2010)

³Nitrogen fertilizer management options. *Integrated Crop Management, IC-486* (2). Iowa State University. February 26, 2001.



Figure 2. Corn leaf damage from broadcast UAN at 100 lb N/acre. Photo courtesy of John E. Sawyer, Agronomy Extension, Iowa State University.



Figure 3. Corn roots damaged (right) from anhydrous ammonia. Photo courtesy of John E. Sawyer, Agronomy Extension, Iowa State University.

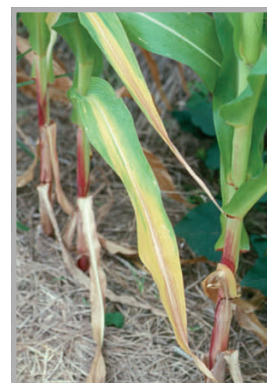


Figure 4. Nitrogen deficiency symptoms in corn. Photo courtesy of John E. Sawyer, Agronomy Extension, Iowa State University.

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