

Maximize Corn Yields by Side-Dressing

The corn crop is in the ground, or close to it. But if maximizing corn yields is your goal, your work is not done. Your growing corn crop needs to be fed.

True, the dry spring may have afforded you the time to apply fertilizer before planting, or part of your fertilizer management plan may include starter fertilizer applied while planting. But again and again, research has proven that side-dressing nitrogen (N) after emergence results in maximized corn yields.



A well-timed NH₃ application.

Dr. George Rehm, an extension soil scientist at the University of Minnesota, stated in his AgBuzz blog: "Research in the Corn Belt conducted over many years has shown that side-dressing is a nitrogen management practice that has consistently produced the highest yields when various times of application are compared. No other time of application has produced higher yields."

This is because the majority of the crop uptake (nutrient demand) tends to occur after the V5 growth stage, or when the plant is about a foot tall. If N is available in nitrate form when the plant is not actively growing, you risk wasting your fertilizer dollars. The key is timing your nutrient availability with a smart split-application plan.

Test for success

Since we had a dry fall and winter, there is good chance that there was a significant amount of soil nitrate left in the soil that the corn crop could use. Your pre-plant and starter applications should have taken this into consideration. As you prepare to side-dress, the United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS) recommends another assessment using the pre-side-dress soil nitrate test (PSNT), tissue testing, or chlorophyll meters to determine the need for additional nitrogen to be applied during side-dress nitrogen application. The test should be done after the spring wet period but before the period of major N demand by corn.

These tests can help predict the amount of N that will be converted into crop-available forms—ammonium and nitrate—during the growing season. This powerful information should help you determine not only the amount of nitrogen to apply to your corn crop, but also in which fields or sections to side-dress. With no break in fertilizer costs in sight, using N wisely will increase profit margins.

Another practical approach to determining N need, which may be the perfect fit for a season with variable precipitation, is performing strip N applications. If there is a growth response or your crop leaves green up, proceed with a side-dress application.

When to apply

Although all soils and regions are different, generally your corn crop will need little N during its early stages. Between the eighth leaf to the tasseling stages, N uptake peaks. Application prior to the V8 stage is recommended.

If a portion of the total N was applied preplant or at planting, a delay in application of supplemental N is not likely going to cause N stress to plants. In cases where no N was applied, or the N supply is very low, make it a priority to apply early (preferably before V6) to avoid loss of yield potential.ⁱ

How to apply

Good – If you planted early and your crop is tall, but you still need additional N, consider an over-the-top application of UAN. The yield boost from meeting the nutrient needs of the crop is likely to

Can UAN solutions be sprayed directly on the corn safely? Post-applications of these products will likely produce some foliar injury to the crop. Research conducted by Gyles Randall looked at 30, 60, 90 and 120 lbs. of N foliar-applied to corn at V3-V4 and found that grain yields were decreased with application rates of more than the 60 lbs. of N/acre.^{iv}

overcome the yield loss from leaf burn as long as application rates are kept to 60 lbs. per acre or less. To prevent foliar damage, fit high-clearance equipment with drop hoses to achieve surface application.

Better – A broadcast side-dress N application can be effective if properly timed. Urea granules are the product of choice to limit leaf burn. Ideally, broadcast when leaves are dry to prevent adhesion to leaves and relatively soon before a forecasted rain—volatilization will occur within three to four days.

Best – Injecting or dribbling N between rows has the dual benefits of reducing foliar damage and limiting urea volatilization. Liquid UAN (28% or 32%) solutions provide the least potential for foliar injury to the crop.ⁱⁱ If applying anhydrous ammonia, make sure soil conditions allow for complete closing of the track—ammonia can escape into the atmosphere and cause foliar damage.

There is time to side-dress—with the right tools

It's not unusual for growers to wonder how they are ever going to find time to make another pass through their fields before the crops get too tall or before the demands of weed control or irrigation take all their time. But the right tools are available to help you get through your fields faster.



Liquid application with an All-Steer tank.

Self-propelled sprayers equipped with coulters to apply liquid can travel up to 18 mph. Tractors with mounted toolbars equipped with liquid coulters can commonly travel 8 to 12 mph. And now, tractors applying anhydrous with single disc openers have been running up to 12 mph. These new operations create very little soil disturbance and have much lower horsepower requirements than traditional machines. Couple these high speeds with the increasing width of some tools—up to 60 feet in some cases—and you can cover acres very quickly.



Self-propelled sprayers equipped with liquid injection coulters widen the application window.



Single-disc injection coulters have low disturbance and can be operated at higher speeds.

One good option for nitrogen injection is a simple coulter and liquid injection system. Producers can start with an existing toolbar (for instance, a row crop cultivator), remove all ground-engaging equipment, and add coulters with rear knives or injectors. Then, by adding a simple pump and plumbing, as well as saddle tanks on the tractor or an All Steer High Capacity Fertilizer Cart, they have created an easy and inexpensive liquid side-dress applicator.

If anhydrous is the preferred nitrogen source, then similar toolbars can be made to handle it as well. New fertilizer coulters designed with side-dressing in mind are readily available. For example, the 2987 Magnum from Yetter Farm Equipment uses a single-disc design that facilitates high-speed anhydrous application and low soil disturbance. When time is of the essence in the spring, growers appreciate the ability to fertilize quickly.

To have a bigger window of time in which to side-dress, producers can consider toolbars equipped with an injection system on high-clearance sprayers. These setups make it possible to feed crops later in the growing season. This type of toolbar is equipped with an injection system that can take on the task of side-dressing as soon as plants emerge and continue even after tasseling.

Side-dressing makes sense

Nitrogen application after emergence has proven benefits, and the right tools are available. Now is the time to begin planning your side-dress application. Done properly, it's unlikely you'll regret it come harvest.

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ⁱ [“3 Tips for Sidedressing Nitrogen on Your Corn Crop,”](#) University of Illinois Extension, June 16, 2011. Accessed April 17, 2012.

ⁱⁱ "[Nitrogen and Sulfur Sources for Sidedress Application](#)," University of Minnesota, June 14, 2011. Accessed April 17, 2012.

^{iv} Ibid.