Higher Nitrogen Fertilizer Prices Affect Corn Fertility Management

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In talking to fertilizer dealers from across Pennsylvania over the last couple of months, it appears that nitrogen fertilizer prices could be as much as 40 percent higher this year.

There are several reasons for this price increase, which have been building for some time.

World supplies of nitrogen fertilizer have been greatly reduced in recent years. The Soviet Union had been a major supplier of ammonia to the U.S. fertilizer market, but with the breakup of that country and reorganization in the eastern European countries, this source is no longer there.

Also, one of the major plants in the U.S. was shut down by an explosion this past year. These reductions in supply coupled with an increase in worldwide demand for nitrogen has resulted in the price increases that we are now experiencing.

What do these increased prices mean to nitrogen management in 1995? There are several factors to consider. As nitrogen prices increase, the economic optimum nitrogen rate will decrease. However, at current corn prices, this increase in nitrogen prices only reduces the economic optimum nitrogen rate by 2 to 5 percent. This is generally less than 10 pounds of nitrogen per acre, and considering that nitrogen recommendations are usually made in 20- to 30-pound-per-acre increments, I don't see recommendations changing much.

The more important effect of these higher prices will be in forcing us to tighten our nitrogen management to maximize the nitrogen use efficiency of the corn crop. First, make sure that your nitrogen recommendations are appropriate. The base recommendation for corn is 1 to 1.1 pounds of nitrogen per bushel of expected yield.

Thus, one of the first places to look at is your expected yields. Expected yields used to make recommendations should be optimistic but realistic. Being overly optimistic about yield expectations and thus fertilizing for unrealistic yields is always costly, but especially so at high nitrogen prices. Expected yields are best estimated from your records of past yield performance.

Another area to look at are credits for nitrogen in manure and previous legume crops. Remember that this nitrogen is worth more now, too. Analyzing manure for nitrogen and calibrating manure spreaders to uniformly apply a known rate of manure are important steps toward realizing the full value of the nitrogen in manure. Where it is appropriate, greater value can be realized from manure by incorporating it as soon as possible after application.

Nitrogen recovery from manure by the following corn crop is 50 to 75 percent if the manure is incorporated immediately. This recovery drops to 15 to 20 percent if the manure is not incorporated. For a 20-ton-per-acre application of dairy manure, this is a difference of more than 60 pounds of available nitrogen per acre.

Timing of nitrogen application may also improve nitrogen use efficiency by your corn crop. Applying the nitrogen as close to the time of crop need as possible reduces the chances of nitrogen loss. This is especially beneficial if early spring nitrogen applications are avoided and the nitrogen is sidedressed after the spring wet period.

During a 10-year period, we have documented in our research an average of nine bushels per acre advantage from the same amount and forms of nitrogen simply by sidedressing.

Sidedressing also allows us to use the pre-sidedress soil nitrate test (PSNT), which is another tool that can help to fine-tune nitrogen requirements. This test is especially useful where manure is being depended on to supply the nitrogen needs of the crop.

In using manure, there is often considerable uncertainty about the nitrogen content and availability of the manure. This is usually dealt with by applying insurance fertilizer to compensate for this uncertainty. However, with the increase in fertilizer prices, this insurance has also become more expensive.

The PSNT has been shown to be a very effective replacement for this insurance fertilization. The test will confirm if there is adequate nitrogen for the crop and, if not, a supplemental nitrogen application can be made.

Nitrogen management cannot be looked at in isolation. All other crop management will have an impact on the nitrogen efficiency of the crop. For example, poor weed control will result in lower yields and significant amounts of the higher priced nitrogen being taken up and used to grow weeds rather than being used by the crop. Many other examples could be cited, such as hybrid selection, planting technique, insect control, soil compaction, other nutrients, etc. Optimizing the whole package of crop production practices will contribute to improving nitrogen use efficiency by the corn crop.

Finally, farmers can almost always get a better price with early fertilizer purchases because it enables dealers to better anticipate farmer needs and lock in better prices with their suppliers. This year, however, there is a much bigger than usual dividend for farmers who have planned ahead and bought their fertilizer early.

The bottom line for dealing with increased nitrogen fertilizer prices is not to arbitrarily cut back on this critical crop production input but to tighten up overall management to maximize the effectiveness of the fertilizer nitrogen that you do use.