



# WATER QUALITY

Fact Sheet #18

Bulletin #7097

## NITROGEN FERTILIZER CHOICES A Supplement to the Maine Soil Nitrate Test for Corn

The information in this fact sheet will help you make a proper interpretation and nitrogen fertilizer applications.

### Choose an expected yield goal category

The results of your nitrate tests are shown on the attached printout. You will find our recommendation choices for each field sample. Choose a realistic expected yield and select the proper recommendation. The numerical value you select will be *pounds of nitrogen needed per acre* to carry your crop to maturity.

Information about selecting a fertilizer source, its characteristics and application, is provided below. Read on before choosing. Your corn is starting to grow rapidly now so act promptly before it gets too tall for your equipment.

### Choose material and method of applying

Use materials on hand or order them from your fertilizer supplier as soon as possible; they must be applied before the corn is too tall. You may *sidedress* between the rows or *topdress*. Both liquid and solid materials are available, as are choices of applicator equipment. Custom services, offered in many areas of the state, may be your best alternative.

### Compare nitrogen characteristics

Compare costs of materials per pound of nitrogen, but also consider the ease of application, tendency to burn, danger of nitrogen loss, availability of equipment and capability to incorporate.

### Compare nitrogen costs

To compare costs, divide the analysis shown on the label into the ton price of dry materials. For

example, if ammonium nitrate sells for \$260 per ton, divide 33, the percent nitrogen in ammonium nitrate fertilizer, into \$260 to show a unit (a unit equals 20 pounds of nitrogen) comparison of \$7.87. Another division by 20 will give the cost per pound of nitrogen — \$.39. Your supplier will have to help you compare liquids. Weight per gallon varies.

### Types of materials

**Urea, low-cost but can easily be lost.** Urea (45 percent N) is usually a less expensive source of nitrogen, with good lasting quality. However, it quickly forms ammonia, which is a gas and can *evaporate* if left on the surface of the ground in hot, dry conditions. Dampness, dew or light showers may aggravate the situation. Normal losses may be about 15 percent, but *up to 1/2 of the total nitrogen application can be lost under extreme conditions*. A good rain to wash it into soil within a day is ideal. Too heavy a rain could leach it below the root zone. Avoid problems by incorporating urea into the soil by cultivation, drilling, rotary hoe or irrigation.

**Ammonium nitrate is convenient and useable. Follow the rules for safe use.** Ammonium nitrate (33 percent N) may not be readily available and is more expensive than urea, but it may be left on the soil surface to be rained-in without fear of ammonia loss. It's nitrate portion is immediately useable by the crop.

**(DANGER!** Ammonium nitrate bears a yellow shipping label and has the potential to be an explosive if allowed to mix with organic materials, especially oil, gasoline, kerosene or diesel fuel. Don't let cows lick it — nitrate is toxic.)

**Ammonia under pressure.** Anhydrous ammonia (82 percent N) is liquified ammonia gas and is an inexpensive source of nitrogen, but must

be soil injected by experienced or custom operators. It lasts longer than nitrate nitrogen.

**Nitrogen solutions.** There are several brands of nitrogen solutions, usually offering varying proportions of urea and ammonium nitrate dissolved in water. Those containing a lot of urea are subject to the same losses as dry urea if allowed to remain on the soil surface. Solution nitrogen can burn plants when sprayed with or without herbicides. They are less damaging if dribbled between corn rows directly on the soil. Having both quick nitrate and longer lasting ammonium nitrogen in the mix is advantageous and environmentally sound.

### Other less common materials

**Ammonium sulphate (20 percent N)** can vary in price, but could be used as a sidedressing or topdressing. It makes soils more acid than other nitrogen sources. Its low analysis means a high rate will be required per acre. Local prices might make this source a viable option.

**Nitrate of soda (sodium nitrate — 16 percent N)** is an old favorite of vegetable growers, but very expensive for field corn. Fast response and nonacidity are virtues. However, it does have a low analysis value.

Materials such as **ammonium phosphate**, 15-8-12, 15-15-15, 20-10-5, etc., are not likely to be used because phosphorus and potash should have been taken care of before planting. Consider them only when potash is very low. Topdressing phosphorus is not an efficient method of making phosphorus available to plants.

### Figuring the fertilizer rate

Refer to your Soil Nitrate Report. Select a realistic expected yield and check how much (if any) nitrogen needs to be applied. For example, an additional 30 pounds of nitrogen per acre is needed and you have decided to use ammonium nitrate. The following is an example of the calculation you need to do. Thirty pounds nitrogen per acre (recommended amount) divided by 33 percent (percent nitrogen in ammonium nitrate) would be calculated as follows:

$$\frac{30}{.33} = 90.9 \text{ pounds/acre}$$

Therefore, you need to apply 91 pounds of ammonium nitrate per acre.

### Methods of Application

Fertilizers may be drilled, injected, dribbled, dropped, sprayed, or otherwise spread between the rows of corn. This is called sidedressing. However, it is possible to *broadcast* dry forms of fertilizer by aircraft or spinner spreaders. Generally, foliar applied liquid sprays will cause trouble by burning foliage.

It would be nice if you could conduct a little demonstration as you fertilize to compare results. Try this:

**Plot 1:** *Skip* four rows, omit sidedressing.

**Plot 2 :** Add a *double* sidedressing by going over four rows twice on an adjacent field strip.

**Plot 3:** Compare these to the *recommended* treatment on the rest of your field.

Extension educators can advise you on how to compare yields.

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