

Special Field Crop CAT Alert edition: Another look at fertilizers



Articles compiled by the [MSU Extension Field Crops Area of Expertise Team](http://www.ipm.msu.edu/fieldcrops) and Natalie Rector, issue coordinator. Visit <http://www.ipm.msu.edu/fertilizer2009.htm> to read the issue online.

Another look at using fertilizers

A word to the wise: question everything these days. Our reasoning powers that worked in the past are strained today. Farmers used to watch the Chicago Board of Trade for commodity prices; today they watch the price of gas at their local fuel station to gain some sort of rationale for how much fertilizer will cost and what the price of grain will be in the coming year. While change may be risky, not changing may be even more risky.

In 2008, fertilizer and commodity prices proved how volatile and irrational markets can be. Nitrogen and phosphorus prices have been coming down, but they are still twice what they were several years ago while the price of potash has quadrupled. It's time to question everything, including the way you have always fertilized crops. Could you be just as successful in harvesting high yields with lower fertilizer inputs? Could even a small change add up to large savings? If you find only one "keeper" idea in this article, it will pay to read on.

Starting point

Soil test, soil test, soil test! Check your pile of soil test reports. How old are they? Do you have current reports for all fields? It's impossible to properly manage soil nutrient levels if there isn't any information to formulate recommendations.

Compaction

It doesn't matter if you take your own soil samples or hire someone else to take them, but a lot can be learned about the status of your ground by collecting your own samples. If you have difficulty getting the soil probe 8 inches deep, as recommended, soil compaction may be limiting the crop's ability to absorb water and nutrients. Reducing fertilizer on such fields will be risky until the compaction issues are resolved. Compacted areas may also cause ponding, which can result in denitrification of N, losing that nutrient up into the air.

pH and micro nutrients

Applying micronutrients is economically beneficial only when a deficiency has been identified in a field. Applying any amount of micronutrient is expensive if need has not been determined. However, soil tests can indicate where potential micronutrient deficiencies are more likely. Compare the pH on your soil tests to the following targets for optimum nutrient availability. For a complete listing, visit <http://www.emdc.msue.msu.edu/mainsearch.cfm?type=E2904> in the inventory number box to search for Nutrient Recommendations for Field Crops in Michigan. Or click on the link for a complete [PDF copy](#).

Crop	Optimum pH on mineral soils	Optimum pH on organic soils
Alfalfa	6.8	6
Beans: dry edible and soybeans	6.5	5.8
Corn	6.5	5.3
Sugar beet	6.5	5.5 (beets are not recommended to be grown on organic soils)
Wheat	6.5	5.8
Grass Pastures	6.5	5.3

When soil structure and pH meet requirements, it is less risky to reduce fertilizer. pH impacts the availability of all nutrients. Low pH can inhibit not only nitrogen (N), phosphorus (P), and potassium (K) but also magnesium (Mg). Use dolomitic lime to increase pH and also supply magnesium. Boron (B) can be a concern on alfalfa, especially on sandy soils.

On high pH soils, zinc (Zn) and manganese (Mn) are generally the first micronutrients that are limited. If you determine a need for micronutrients, purchase only the ones your soil test shows are needed. Generally, soil has abundant supplies of these nutrients for crops; let the soil do its job.

Cutting nutrients based on new additive products

If it sounds too good to be true, maybe it is. A common sales angle is to suggest that using a particular product will allow a farmer to succeed with reduced nutrient values. Do you want to swap your known nutrients for unknowns when every drop counts? When confronted with new products that are unfamiliar to you, ask for independently verified research results that include statistical analysis. Many of these products induce variable results, so wild swings can be seen in numerical yields. Demand evidence of consistent, statistically significant results. Iowa State University houses a web site for the North Central region on soil additive and growth stimulant products at www.agronext.iastate.edu/soilfertility/nutrienttopics/addbyproducts.html. Or contact your local extension educator or campus specialist. Many of these products have been tested by universities in the North Central region, including Michigan State University.