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Making Fertilization Decisions As Fertilizer Prices Escalate and Production Costs Are High - Part 1

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Making Fertilization Decisions As Fertilizer Prices Escalate and Production Costs Are High - Part 1

Abstract

Fertilizers are at unbelievably high prices, with reports of tight supplies and potash allocation to dealers. Total crop production costs are causing credit supply issues, which complicates decisions to allocate available funds for production expenses. These issues are causing producers to consider changing production practices, including cutting back on inputs like fertilizer. What can be done?

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Making Fertilization Decisions As Fertilizer Prices Escalate and Production Costs Are High - Part 1

By John Sawyer and Antonio Mallarino, Department of Agronomy

Fertilizers are at unbelievably high prices, with reports of tight supplies and potash allocation to dealers. Total crop production costs are causing credit supply issues, which complicates decisions to allocate available funds for production expenses. These issues are causing producers to consider changing production practices, including cutting back on inputs like fertilizer. What can be done?

There is a lot of uncertainty, with no clear or definitively correct answer for all situations. Remember crop prices are also very high, which certainly helps pay for more expensive fertilizer. High crop prices can even result in greater net return to fertilization where there is a yield response to added fertilizer than when crop prices are low. So there is no simple answer, and sometimes no change to production practices is the correct approach.

Consult with Advisers and Dealers

Producers should work closely with their crop adviser and dealer to figure out the best options and production plans for this fall and next spring. This is always important, but more so right now as the fertilizer purchase/supply dynamics are changing dramatically and quickly.

Soil Test

Soil test to know what P, K, and lime applications are really needed. Avoid applications to fields or field areas that do not need the nutrients or lime. Compared to the cost of nutrient and lime inputs, soil testing is inexpensive and provides a good return on investment. See the ISU Extension publication PM-287, [Take a Good Sample to Help Make Good Decisions](#), for soil sampling suggestions.

Evaluate soil test results to determine P, K, and lime requirements. See ISU Extension publication PM 1688, [A General Guide for Crop Nutrient and Limestone Recommendations in Iowa](#) for soil sampling suggestions. As stated in that publication, the percentage of P and K applications expected on average to produce a yield response within each soil test category is 80 percent for Very Low, 65 percent for Low, 25 percent for Optimum, 5 percent for High, and less than 1 percent for Very High. This means that as soil test levels increase, the probability of a yield increase to fertilization and the amount of expected yield increase decrease, and net return also decreases and usually becomes negative at High and Very High test levels (Figure 1).

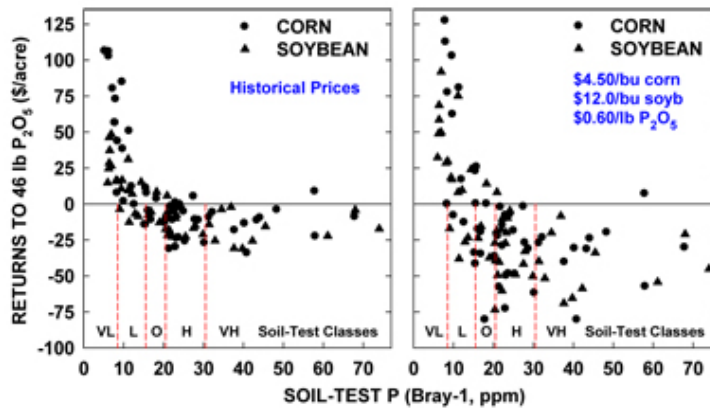


Figure 1. Net return to P application at different soil test levels and crop/fertilizer prices, Antonio P. Mallarino.

Phosphorus and Potassium Applications

For making fertilization decisions, P and K should be applied where the chance of yield increase is large, and the expected yield increase is sufficient to at least pay for the applied nutrient (Figure 1). Remember, manure can supply P and K (as well as N and other nutrients) but its market value has also increased with high fertilizer prices and is not available to many for various reasons.

Due to crop removal, withholding fertilizer or manure applications will result in a gradual soil-test decline (Figure 2). Therefore, if soil tests are in the High and Very High categories, some of the P and K “banked” in the soil can be used for next year’s crop production and no application is needed. Only apply P and K to soils testing Low and Very Low, with optional application when tests are Optimum.

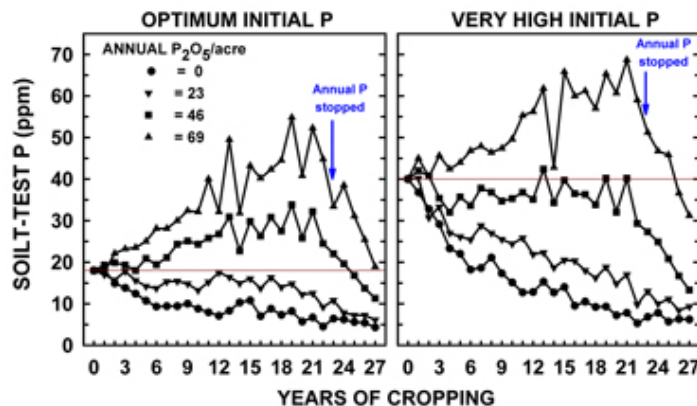


Figure 2. Change in soil test over time with different beginning soil test level and rates of applied P, Antonio P. Mallarino.

Application to maintain soil-test values in the Optimum category is considered a good practice to sustain profitable crop production over time. However, applications can be withheld until the next year especially when product supply is really short, funds are needed for other more critical inputs, or land tenure is uncertain.

This is because the expectation for economical response to P and K in the year of application is small in the Optimum category and it becomes more uncertain as the price ratio becomes unfavorable (Figure 1). Crop yields in many fields are high again this year, so crop removal will be influencing soil test levels. In fields severely impacted by the wet conditions, lowered yields will result in removal of less nutrients and some fertilizer applied for this year would be available for next year’s crop.

Therefore, withholding applications may work in some fields or field areas, with the number of skipped years depending on the beginning soil test level, but will not work in other fields or field areas. Soil testing is the only way to know.

An option instead of not applying any P or K when the soil test is in the Optimum category would be to apply partial crop removal. This would slow the soil test decline and should provide adequate fertilization for the small and occasional first-year yield response.

For the corn-soybean rotation, many producers apply P and K needs for both crops once, before corn. This is as effective as applying those nutrients ahead of each crop as long as the fertilizer need for both crops is correct. However, if fertilizer price/availability will be better next fall, money could be saved now by applying the nutrient need of one crop and fertilizing again next year. Also, the cost of application, in relation to total fertilizer cost, is less now than in previous years so making single-year applications should be more viable.

Resources

The above mentioned publications, as well as other nutrient management information, are available on the [ISU Agronomy Extension Soil Fertility](#) Web site.

(Sawyer and Mallarino continue this topic in [Making Fertilization Decisions As Fertilizer Prices Escalate and Production Costs Are High - Part 2](#) . They discuss liming soils and factors to consider when making nitrogen fertilization decisions.)

John Sawyer and Antonio Mallarino are professors of agronomy, both with research and extension responsibilities in soil fertility and nutrient management.

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