

Flooded Fields and Nitrogen Status

A hidden threat to crops and farm income may be loss of nitrogen caused by excess water, says an agronomist at the University of Missouri. Re-application of nitrogen fertilizer may be needed for successful cropping on many fields, said Peter Scharf, extension soil fertility specialist. This will be especially true of fields that have been submerged, but may also apply to fields that have received excessive rainfall in the western part of the state.

In saturated fields, nitrogen is lost three ways, Scharf said. It can be leached below the root zone, flushed off with surface drainage, or undergo denitrification, where the fertilizer is converted to gas that escapes into the air.

Nitrogen is a major nutrient required in producing good yields of corn, milo, wheat, and grass hay or pasture. Without nitrogen, crop production can be severely limited.

Scharf said that it is difficult to predict nitrogen loss, but in flooded fields, up to 100 percent can be lost.

Also vulnerable are fields that were fertilized early. "We had a lot of nitrogen fertilizer go out last fall. Those fields may be in trouble in the western part of the state. Early-spring applications of urea, UAN solution, or ammonium nitrate may also be vulnerable to heavy losses in these areas," he said.

Diagnosing how much N has been lost is difficult. "Soil nitrate tests can be used, but they're slow and hard work," Scharf said. "Samples would need to be taken at least to a two-foot depth, and many people don't have the right sampling equipment to go that deep." Instructions for sampling and for interpreting sample results can be found in University of Missouri Extension Guide G9177.

Another option is to use the color of the crop to diagnose how much N remains. "I would recommend adding at least 100 pounds of additional N in a small area of the field. This can be done when replanting for fields that were flooded, or by hand or with sidedress equipment for fields where the crop was not lost." The high-N area should be marked with flags or using a GPS, he said. "Then, if you can see that the crop is darker in the area where extra N was applied, you know that the whole field will need additional fertilizer." The bigger the color difference, the more N is needed.

Most fields that have been saturated for more than a few days will probably respond profitably to 40 to 60 pounds of supplemental nitrogen. Some fields will need more. Any N source or application method is acceptable, Scharf said, except that broadcast UAN solution should be avoided for corn that is 2 feet or taller.

Corn that survives saturation or submergence will probably have lowered yield potential, but may still give highly profitable responses to additional N fertilizer if N has been lost from the field.