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Opinion: For nitrogen fertilizer management in a drought, Iowa farmers are encouraged to evaluate fall applications

We applaud farmers throughout Iowa and the entire Corn Belt for increasing use of the four R's of nutrient stewardship.

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Weather is an unpredictable wild card for Iowa's farmers, but drought poses greater challenges than usual. Drought can affect nitrogen fertilizer management by reducing outputs from the system — both in grain harvest and environmental losses — leaving more nitrogen in the soil and a greater possibility of nitrate loss after a big rain.

Drought may have a surprisingly small effect on yield (as farmers are reporting this fall), but dry conditions still reduce nitrogen losses: Lower precipitation moves less nitrate from the soil to rivers and streams and dry soils limit microbial denitrification losses to the atmosphere. How is nitrogen fertilizer lost to the atmosphere? When soils are wet and there is no oxygen for microbes to breath, they instead breath nitrate, releasing nitrogen gases to the atmosphere.

Fewer nitrogen losses are a good thing, but the nitrate that is not lost remains susceptible to loss. Farmers in drought-stricken regions of the state have an opportunity to use that nitrate. Soil testing can help farmers determine how much nitrate remains, and cover crops can help retain what remains in the soil.

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Iowa State University predictive models indicate that many Iowa soils currently have much more nitrate than in an average fall, especially in the high-yielding Des Moines Lobe and Iowa Surface landforms of north-central Iowa. That's why Iowa Corn and Iowa State University are

encouraging Iowa farmers to take important steps to better manage soil nitrogen this fall, so we can avoid potential water quality challenges next spring.

We experienced similar conditions in the drought of 2012, when lower yields and fewer environmental losses resulted in large residual soil nitrate levels after harvest. That fall was followed by one of the wettest springs on record in Iowa in 2013, when major rain events led to massive flushes of nitrates into rivers and streams. Unfortunately, that resulted in extremely high nitrate levels in the Des Moines and Raccoon rivers, exceeding the 10 parts per million Safe Drinking Water Act Standard and forcing Des Moines Water Works to operate its denitrification plant.

Therefore, we are encouraging Iowa farmers to take extra steps to carefully manage future nitrogen fertilizer applications — especially this fall.

We encourage Iowa farmers to talk with their Certified Crop Advisor or agronomist and consider the following:

Determine field soil nitrate levels: Yields may be surprisingly high despite the drought, but soil nitrate levels may also be surprisingly high due to the drought.

If soil nitrate levels are high, reduce fall fertilizer application, split fertilizer application between the fall and the spring or apply 100% in the spring.

Plant cover crops to use excess nitrate, reduce erosion, and improve soil health.

Use nitrification inhibitor products. All fall nitrogen applications should be accompanied by a nitrification inhibitor regardless of drought and soil nitrate status.

Regardless of drought or soil nitrogen status, soil temperatures at 4 inches must be below 50 degrees and trending downward before applying fall nitrogen fertilizer.

We applaud farmers throughout Iowa and the entire Corn Belt for increasing use of the four R's of nutrient stewardship to ensure that the *Right Source of fertilizer is applied in the Right Place, at the Right Rate, and at the Right Time*. Considering the current drought conditions and potentially high nitrate levels in our soil, we encourage Iowa farmers to take extra steps to carefully manage nitrogen fertilizer this fall to help keep nitrate out of our waterways next spring.

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