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MANAGING CROP NUTRITION IN A CHANGING CLIMATE

Uncommon weather is becoming more common. Extreme weather has implications for managing crops and their nutrition. To adapt, what should you be considering in terms of strategies for managing plant nutrients?

The Intergovernmental Panel on Climate Change recently released a special report on extreme weather events. While its most confident prediction is a global increase in heat waves, it also states "It is likely that the frequency of heavy precipitation or the proportion of total rainfall from heavy rainfalls will increase in the 21st century over many areas of the globe." In particular it projects increased heavy rain events in winter months for most of the eastern and northern portions of the Corn Belt. The report also notes that while some areas of the world appear to be on a trend to longer and more severe droughts, central North America seems to be going the other way. Projections for floods, tornadoes and hail are acknowledged to be almost impossible to predict.

Adaptation is ongoing. As a producer you can adapt to increased temperature by choosing crops and cultivars that tolerate hot weather, and by planting crops earlier. With more intense rain events, the importance of conservation tillage to protect soil and nutrients from erosion and runoff will only increase. And there are also important considerations for managing crop nutrition. What happens to the choices for right source, rate, time and place when the weather becomes less stable?

Source. You have choices that influence the fate of the nutrients you apply, particularly N. You can slow the release of urea with coatings, or delay its conversion to ammonium with an inhibitor. Other inhibitors delay the transformation of ammonium to nitrate. These forms differ in how they move and are transformed in wet soil during periods of excess moisture. Some can also prevent salt injury in dry soil. Consider the weather in your choices of source.

Rate. If yield goals were hard to set in the past, they may be even more difficult to predict in the future. If you felt you needed a little extra for insurance with normal weather, the temptation may increase when weather becomes more variable. There are alternatives! Particularly for N, you can use crop sensors and/or weather-driven crop models as decision support tools. These tools can help you take into account and respond to the dynamic changes in weather.

Time. Splitting the dose into multiple applications can help minimize risk of loss and maximize nutrient supply to the crop. Does your equipment enable you to take advantage of narrow application windows that open up? Can you respond to short-term forecasts that assure that applied nutrients will stay in the soil? Can you fit your application timing to the growth stages of crops that might happen earlier than usual? These are questions to ask when reviewing your investment in application equipment.

Place. If rainstorms are more frequent and intense, leaving nutrients on the soil surface makes even less sense than before. Placing nutrients in the soil close to where the roots are growing adds resiliency to your crop management. Invest in equipment that can place the right nutrients in the soil at the right time, rapidly enough to fit application windows that might be shorter and at different times than in the past.

Experiment to adapt. This spring in Ontario Canada some farmers planted small areas to corn in March. Much earlier than generally recommended! But each time you try something new, provided you keep good records, you learn something, and it may turn out to be more valuable than you expected.

The adaptive management built into 4R Nutrient Stewardship emphasizes learning from results. Following 4R principles can help empower you to make the right choices in response to a changing climate.

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Abbreviations: N = nitrogen

Note: *Plant Nutrition TODAY* articles are available online at the IPNI website: www.ipni.net/pnt