

PLANT NUTRITION TODAY

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SOMETHING FOOLING YOUR GREENNESS SENSOR?



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When crop prices are low, most farmers tend to manage their resources more conservatively; and some may whittle their fertilizer inputs to just one or two major nutrients. If recent soil fertility management and nutrient rates have been excellent, then slight fertilizer cutbacks may only modestly short-change plant nutrition. However, if that strong fertilization history is not the case on your farm, cutbacks in nutrient inputs can be costly. Cutting back on nitrogen (N)—the real “horsepower” in crop nutrition—may severely penalize yields, crop quality, and profits.

Remote sensing by multispectral satellite imagery, crop sensing from airplane or other platforms such as unmanned aerial vehicles (UAVs), and measuring crop greenness using chlorophyll meters or digital cameras—and the calibrated software and

geographic information systems that may be linked to each technology—are being increasingly used by skilled farmers and their crop advisers. Some farmers have relied on their own on-farm N rate response trials, while others have trusted their past field-by-field experiences, or state/provincial/regional N rate response trials, to guide N rate management. Perhaps too often, others rely on current season seat-of-the-pants visual evaluation of adequate N nutrition.

Increasingly, more farmers and applicators are split applying and varying the rates of their N inputs for major cereal grain crops (and forages), to better match soil and fertilizer N supply with crop uptake demands, and to hedge against the effects of increasing weather uncertainty. For crop N sensing and greenness tools to work effectively, one must first be



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certain that other nutrients are not limiting. Even the most sophisticated greenness-sensing tools can be fooled by “hidden hunger” and deficiencies of other essential nutrients like sulfur, zinc, iron, and manganese. This “hidden hunger” is one reason why most university and government N nutrition and N-sensing researchers recommend N-rich test strips for in-field, in-season, N-sensor calibration and confidence-building. Even when those detailed “N reference” steps are taken, one needs to also pay close attention to the potential influence of non-nutritional stresses (e.g., insect and disease pressure, potential herbicide drift, dry or wet soil moisture, and even air pollution) on crop color and vigor.

More farmers and crop advisers are recognizing that all fertilizer N management should be based on the principles of 4R Nutrient Stewardship. Farmers make decisions, both before planting and in-season, that

are increasingly informed by their soil and cropping system characteristics and past environmental conditions. Farmers also face broader considerations; such as the “manageability” of N sources by the fertilizer dealer, the applicator, and the farmer. There are many complexities along the supply-to-application management process (i.e., fertilizer storage, transportation, delivery, tenders, applicators, spreaders, planter units, tillage equipment, time and labor limitations) that affect the ability of farmers to respond to their crop fertilizer N needs, and to manage plant nutrition as optimally as desired.

This year, don’t let your sense of greenness be fooled. Ensure your crop has all the right nutrients, using soil tests or plant tissue analysis to check whether anything else is limiting response to the N your sensor recommends.

