

Active sensors shine light on crops' midseason nitrogen needs

By Rich Fee, Crops and Soils Editor

GreenSeeker

The GreenSeeker sensor technology was developed by NTech (formerly known as Patchen) and Oklahoma State University researchers in 2001 and 2002. NTech sold the first handheld sensors to wheat producers in 2002 and corn growers in 2004. Sensors for fertilizer applicators came later.

The GreenSeeker sensor is termed an active sensor because it generates its own light source rather than relying on ambient light. The sensor uses light-emitting diodes (LED) to generate red and near-infrared (NIR) light. The light generated is reflected off the crop and measured by a photodiode located at the front of the sensor head (see photos).

CROP TELLS YOU ITS NITROGEN NEEDS

Red light is absorbed by plant chlorophyll during photosynthesis. Healthy plants absorb more red light and reflect larger amounts of NIR than unhealthy plants. The red light and NIR light readings from a crop, when compared to a nitrogen-rich calibration strip in the same field, are used to gauge the crop's yield potential and nitrogen needs.

Growers using the system apply a reduced rate of nitrogen (N) early,



Photographs: Rich Fee

Ted Mayfield explains how the GreenSeeker sensor works. Red and NIR light emitted from diodes in the rectangular window are reflected off the corn and measured by a photodiode in the round opening.

then topdress or sidedress based on what the GreenSeeker reveals about the crop during the growing season.

Two versions of the GreenSeeker system were available this year. Several wheat growers in Oklahoma used a handheld version in conjunction with N-rich calibration strips to determine the best flat rates of N for topdressing on each field.

Meanwhile, corn growers in the Midwest and wheat producers

in the Dakotas and Canada were using GreenSeeker RT200 systems on nitrogen application rigs to simultaneously gauge the crops' N needs and to apply the amount of N the system called for.

The handheld system costs \$2,900 (without a PDA). The RT200 system, which includes six sensors, mounting brackets, a color computer, and software, costs \$22,500. It is usually used with injection rigs or 60- to 90-foot-wide sprayers.

Ted Mayfield, chief operating officer of NTech, estimates that RT200 systems were used on about 10,000 acres of wheat and 10,000 acres of corn this year. ■



learn more

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