First-Of-Its-Kind Fertilizer System "Reads" Crop Need

Soil sampling may be a thing of the past if this revolutionary new "Greenseeker" fertilizing system catches on. That's because it "reads" the nitrogen needs of crops on-the-go and only applies what is needed.

The first-of-its-kind system was introduced at the recent World Ag Expo in California.

The GreenSeeker variable rate system top-dresses fertilizer after using optical sensors to detect plant needs. The system is currently available for wheat and corn. A cotton version will be released later this year or early next year.

"It applies less fertilizer where less is needed and more fertilizer where it can be used. Based on university field tests, wheat growers can expect an $8 to $10 per acre return," says John Mayfield, Ntech Industries, Inc., Ukiah, Calif.

Developed in partnership with Oklahoma State University (OSU), the system uses an optical sensor and microprocessor-driven spray control system. The sensors mount on the boom next to conventional nozzles and sprayer components. The sensors measure nitrogen needs in a 2-ft. sq. area and work by capturing light reflected from the plant. A microprocessor circuit board analyzes the reflected light and determines whether to activate the spray nozzles for that 2-ft. sq. area and, if so, how much material to apply.

"It eliminates wasteful broadcast spraying, which applies the same rate to all the crop," says Mayfield. "We tested the system last year on more than 400 acres of winter wheat, using a 60-ft. boom system on 10 different fields. Results in wheat showed yield increases of 4 to 9 bu..," says Mayfield. "A big advantage is that the system works in real time without the need for expensive, time-consuming Global Position Satellite and field mapping. If you want, field maps of sensor measurements and amount of material applied can be made, however."

Conventional inputs of nitrogen based on historical yields results in two thirds of the nutrients being lost to the environment, says Dr. Gordon Johnson, Ph. D., Regents Professor at OSU. "Optical sensing increases nitrogen use efficiency by about 80 to 90 percent, reducing the amount lost to the environment from an average of 65 percent currently to only 10 to 20 percent."

Several years ago Ntech developed its "WeedSeeker" spray system for herbicides. It uses optical sensors to signal a spray nozzle to deliver a precise amount of herbicide to weeds instead of bare ground. It's used when preparing fallow ground for seeding.

"Since our optical sensors use artificial light, the variable rate system works for both day and night spraying. Using it at night will reduce fertilizer volatility and wind drift," notes Mayfield.

Both systems sell for about $1,000 per boom foot.

The company also offers a new hand held crop research and consulting tool that goes with the GreenSeeker. It can be used to monitor changing field conditions and to quantify basic nutrient response, crop condition, yield potential, stress, and pest impact.

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GreenSeeker system "reads" the nitrogen needs of crops on-the-go and only applies what is needed. It's shown here with optical sensors and variable rate nozzles mounted on a 60-ft., self-propelled sprayer.

Optical sensors work by capturing light reflected from the plant. Sensors mount on boom next to conventional nozzles.

Sensors measure nitrogen needs in a 2-ft. sq. area. A microprocessor circuit board analyzes the reflected light and determines whether to activate the spray nozzles for that 2-ft. sq. area and, if so, how much material to apply.

"Artificial Dew" Machine Adds Moisture To Dry Hay

Baling alfalfa below 12 percent moisture can cause leaves to shatter and fall off stems. A new "artificial dew" machine solves the problem by injecting water - with a softening agent added - into windrowed alfalfa.

The Dew Simulator is designed to be used about 10 minutes before baling. The machine has a reel equipped with 18-in. long tines on 5-in. spacings. A pto-driven piston pump delivers water and the softening agent from a customer-supplied trailer tank to the tines. The tines poke down into the windrow and spray in a fine mist from the bottom of the windrow up. The tines are on a cam so they enter the windrowed hay vertically without disturbing it. Liquid is released only when the tines are within the hay.

"It leaves the windrow as soft as if it had just received the ideal amount of natural dew," says Jeff Roberts, Harvest Tec, Hudson, Wis. "We've field tested the unit on about 10,000 acres during the past four years.

In the past, many farmers have tried to spray over the windrow to bring the moisture content up. However, they can only reach the top of the windrow.

"The application rate can be adjusted according to the alfalfa yield. At a treatment rate of one ton per minute, the Dew Simulator causes up to a 6-point increase in moisture. The application rate can be adjusted by a valve trip that adjusts for windrow depth and yield variations. Application requires 10 to 18 gal. of water to one pint of softening agent per acre, so most producers will want to pull about a 1,000-gal. tank behind the machine."

Because of dry weather conditions, many hay growers in western states have to bale at night. Roberts says the goal of the Dew Simulator isn't to replace nighttime baling, but to expand the number of hours of baling. "You can use the machine to start baling earlier in the evening and run it until natural dew comes

Machine creates "artificial dew" by injecting water with a softening agent added. Tines on reel poke down into windrow and spray in a fine mist.

in, and also to bale later in the morning as the alfalfa dries and before the sun gets too direct."

The Dew Simulator sells for about $25,000.

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Coal-Fired Grain Dryer

Normal grain-drying fuels, like fuel oil, LP or natural gas, have been a little pricey lately. Laurence Zook has a solution: coal.

Zook found an old stoker and cast iron furnace and refurbished both. Then he added an insulated sheet metal jacket around the furnace and fitted it with a 12-in. pipe air inlet and exhaust.

To dry grain, he turns his bin aeration fan around - so it blows into the bin - and runs a 12-in. pipe from the furnace jacket to the inlet side of the fan.

"I set the thermostat on the furnace so air going into the fan is a steady 100 degrees. At this temperature, it will dry about 140 bu. of small grain 5 or 6 points in about an hour," Zook says. "Coal is easy to buy around here and it's cheap compared to other fuels, so the drying cost is only about a cent a bushel."

After neighbors saw what Zook had, he got requests for more. He's made and sold half a dozen of his coal-fired dryers. All are mounted on two-wheel trailers so they can easily be moved from bin to bin or farm to farm.

The bin on the stoker, which automatically feeds the furnace, holds about 50 lbs. of coal. "If you're running around the clock, that's not enough coal to keep it going, so you'll need to load it a couple of times a day," Zook says.

"I have two of them ready to go right now that I'd like to sell for $3,000 each," he adds. "I've used them on wheat and sunflowers and they work great. They're good for drying seed, too, because they work at temperatures low enough that the germ isn't harmed. I see no reason they wouldn't work on corn or anything else you'd like to dry with low temperatures."

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Laurence Zook turned an old stoker and cast iron furnace into this coal-fired grain dryer. It mounts on a 2-wheel trailer, allowing him to easily move it from bin to bin or farm to farm.