TECHNOLOGY ISSUE:
GrowSmart Simplifies Irrigation

GrowSmart and Zimmatic educate the next generation

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GrowSmart Technology Helps Boise Manage Waste Disposal

When you're farming 4,000 intensively irrigated acres (1,619 ha), how do you cut your work force in half and save a million kilowatts of power in the bargain? For the answer, stop in at 20 Mile South Farm near Kuna, Idaho, and see how they're using Lindsay's new GrowSmart technology.

Of course, this is more than just your average farm. Owned by the city of Boise, it functions as the final stage in the city's comprehensive wastewater recycling operation. In brief, the overall process involves removing solids from city wastewater and treating them in digester tanks to minimize odor and destroy potentially harmful pathogens. Then, after much of the absorbed water is pressed out, the remaining materials (called biosolids) are spread over land used to grow corn, alfalfa and barley.

Dave Skinner, who manages 20 Mile South Farm said, "What we're actually doing is 'mining'. That is, we're using the crops to 'mine' nitrogen, phosphorous and other elements out of the biosolids and complete the recycling process."

And the farm's mining responsibility keeps on expanding. Boise's population has grown rapidly — about forty percent in the last decade — and its nearly 190,000 people generate some 80 tons of biosolids every day.

Making certain this endless supply of fertilizer is used in a way both environmentally safe and economically practical is no easy job. After being trucked to the farm, biosolids are stored in concrete bunkers to await application with a manure spreader. Then they are incorporated into the soil through irrigation.

This sounds fairly simple, but when you look at the scale of the operation and the necessity of meeting strict environmental guidelines, it becomes a complex management task. As with any cropping program, getting the right amount of water at the right time is important — but at 20 Mile South it's crucial. Too much water threatens leaching and potential groundwater problems. Too little and crops won't efficiently reclaim nutrients from the waste. So, like many large-scale irrigators, Dave Skinner has been surfing a steady wave of advances in irrigation technology.
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~Dave Skinner

"The time we saved using the AIMS Advance panels got us thinking about how we might end our dependence on using tenants to handle our irrigation," Skinner said. "So last winter we started talking with Agri-Lines about a way to network our entire pivot operation and control it from the farm office."

All of which was perfect timing for introducing two important components of Lindsay’s new GrowSmart technology: (1) The new FieldBOSS panel for automated pivot control, and (2) Online Control for remote monitoring and management of multiple systems.

As the successor to AIMS Advance, FieldBOSS is designed to be the industry’s most “user-friendly” control panel. This makes it easier to set up everything from a multi-step, multi-day irrigation plan to simple start and stop manual operation.

"I’d been used to working with AIMS Advance, so the first thing I noticed was that the FieldBOSS panel is a lot friendlier to use," Skinner said. "It’s laid out so you can understand it better and there’s less to do in getting the information you need and using it to either set up a long-term irrigation plan or run manually."

And, of course, pivot operation is a lot handier when you can do it by moving a “mouse” and clicking on your computer screen. Which is what Skinner is doing these days.

By fall, eight new FieldBOSS panels had joined the four AIMS Advance panels already in use on pivots at 20 Mile South Farm. Then, using GrowSmart’s new Online Control, the entire 16-pivot system was networked via modem into a computer in the farm office.

If you’re new to this type of operation just visualize that Online Control lets you use your computer to automatically manage the operation of an unlimited number of pivots. For starters, this means that Skinner or his crew can “visit” their entire 16-pivot network without leaving the office at 20 Mile South Farm. And they can do it instantly instead of investing the hours and miles it would take to travel there in person.

The “home page” of their GrowSmart Online Control system shows them the entire pivot network at a glance. Pivot circles are color coded to indicate operating status, i.e., “running,” “off,” “applying chemicals,” “alarm.” Equally convenient, just by entering a simple command they can also call up an exact image of each pivot’s control panel on their computer screen. Then via keyboard and mouse they can “run” it just as if they were in the field. This lets them monitor status, make changes, enter new irrigation plans and call up information they need for vital EPA record keeping. In case a system shuts down unexpectedly, an automatic alarm is available to forward a trouble call to any designated phone.

"It’s working out good for us," Skinner said. "Our job is to be sure we’re balancing our application of biosolids and water so that we’re getting maximum uptake by the plant. And...
Zimmatic pivots have been steadily replacing other makes and other types of irrigation in the major land application operation conducted at 20 Mile South Farm.

That's tough to do if you're running around trying to keep track of systems that are spread over nine sections on several different crops. So by pulling everything together with Online Control we can get a lot more precision in the way we're using energy and water — with a lot less labor.

Sitting at his computer, Skinner combines information gleaned from moisture-sensing probes in each field with data on the evapotranspiration rate and nutrient intake of each crop. This translates into an irrigation plan which, via keyboard and mouse, he enters on each system's panel just as if he were in the field. For one pivot it may be as simple as running a full circle and stopping. For another it may combine a range of variations in application rate, system speed, time of day, day of week — anything needed to tailor irrigation to a field, its varying soil types, crop and climate.

To coordinate irrigation with climate conditions, each of the panels on the farm's 12 pivots is equipped with a weather station. This monitors wind speed and rainfall and can automatically shut down the system at specified levels. In addition, plans call for tying the moisture probes into these stations so that the Online Control system can be used to automatically monitor a full range of weather and moisture conditions.

Looking ahead, plans are to eliminate all the whee-line irrigation at 20 Mile South Farm and expand the Online Control network to operate a total of 23 pivots. "That's easy," Agri-Lines' Quinn Vickers said, "because Online Control can handle an unlimited number of systems."

Both FieldBOSS and Online Control are compatible for use in upgrading all pivot brands. Which, according to Vickers, is the whole idea behind GrowSmart technology. "Irrigators are always looking to gain more efficiency in the way they use their resources," he said, "and, for most of them, moving to a better control system is the place to start. GrowSmart makes that easier."

Each day more than 80 tons of biosolids from the city of Boise are trucked to 20 Mile South Farm to be spread on cropland, then watered in by Zimmatic pivots.