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MU Research Shows Drainage Can Boost Corn, Soybean Yields

Farmers and contractors can get in-depth training in the design and installation of subsurface drainage systems at a three-day workshop, Feb. 18-20, at the Ramada Conference Center in St. Joseph, Mo.

Drainage and subirrigation systems have boosted corn and soybean yields on test plots at the University of Missouri Greenley Research Center, said MU research agronomist Kelly Nelson, who will discuss his research at the workshop.

Rising commodity prices, persistent rainfall during the 2008 planting season and greater availability and affordability of specialized installation equipment—such as laser- and GPS-guided tile plows—have many Missouri farmers and contractors taking a serious look at drainage and subirrigation systems.

"The workshop focuses on the design of drainage water management systems," Nelson said.

Workshop sponsors are the Missouri Land Improvement Contractors Association (MLICA), the Natural Resources Conservation Service (NRCS) and University of Missouri Extension.

Subsurface drainage systems involve an underground network of plastic pipes that lowers the water level in the soil, allowing fields to dry faster to permit early planting. Modern systems incorporate equipment for regulating water flow to limit nitrate loss. The network also can serve as a subirrigation system, transporting water to fields, but this is considerably more expensive.

Workshop participants will work in teams to design a drainage system for a particular site.

Good design is crucial, Nelson said. Pipes must be installed at the proper depth, slope and spacing to work effectively. Designing the system requires a thorough understanding of a field's topography, soil properties and other characteristics.

"I think it's a great opportunity for farmers to become educated on drainage water management," he said. "Even if they aren't going to install a system themselves, it gives farmers a better understanding of what's going on and what to expect from their contractor."

That's important because subsurface drainage is still relatively rare in Missouri, so finding experienced contractors can be difficult, said Peter Scharf, MU Extension nutrient management specialist.

"There isn't a culture of drainage in Missouri, except in the Bootheel," Scharf said.

That's partly due to Missouri's claypan soil. "Because the soil moves water so slowly, pipes have to be close to the surface and close to each other," Scharf said.

This makes drainage systems more expensive, but they can still be cost-effective.

Last August, more than 100 people endured rain and mud to attend a demonstration of drainage/subirrigation installation at MU's Bradford Research and Extension Center.

At Greenley Center, the MU Drainage and Subirrigation (MUDS) project has produced impressive yield increases on corn and soybean fields incorporating drainage-only or drainage-with-subirrigation systems.

"Over the past seven years we've seen about a 20-percent increase in soybean yield and about 15 percent in corn with drainage-only systems," Nelson said.

On fields equipped for both drainage and subirrigation, soybean yield averaged 30 percent higher, and corn 60 percent higher, than fields without any subsurface water-management system.

"We have a lot of volatility in the markets already," he said. "Drainage water management lets you level out the production so you can capture the high prices when they come around."

"Kelly proved you can use tile drain on claypan soil," said Eddie Hoff, a Cooper County farmer who installed a drainage system on chronically wet bottomland in 2005.

Hoff will be discussing his experience at the workshop. Other presenters include contractors, tile manufacturers and engineers from NRCS.

Nelson's presentation will cover recent research on how water management affects yields under different soybean and corn varieties and under enhanced-efficiency fertilizers such as polymer-coated urea.

The workshop will take place at the Ramada Conference Center, 4016 Frederick Blvd., St. Joseph. Registration is \$249 (\$199 for MLICA members) before Feb. 6. Registrations

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