Tiling Field Day Demonstration Set for November 19th

The use of tile in areas that need drainage has increased in northwest Missouri. On Monday, November 19, there will be a tiling demonstration starting at 1PM and concluding at 3PM. The field day will be held on Highway 159 in Holt County east of Big Lake approximately 4 miles. In case of rain, the meeting will be moved to the following Monday, November 26th at the same time.

Dr. Kelly Nelson, University of Missouri Researcher, will provide research data on how tile can be used in a drainage and subirrigation method. Also, a contractor will be on-site installing the tile. Tile, mains and subsurface irrigation products will be donated by a local vendor.

During the installation process, there will be two sets of drainage spacing in two different soil types. Long-term yield data from the site will be used to examine the economics of tiling in river bottoms.

Subsurface Drainage

Subsurface drainage is used to drain excess water from the root zone of plants by artificially lowering the water table. This is handled by installing a series of drainage pipes usually just below the root zone. The drainage then dumps into a ditch or stream.

A general rule of thumb is to lower the water table 10 to 12 inches below the soil surface in 24 hours. By draining the excess water from the soil where plants grow allows the soil to aerate and reduces the potential damage to the roots.

Using Tile Lines for Subirrigation

Subirrigation and drainage can be used with the same system. Water is supplied using control structures to regulate the water table level in the field. Irrigation water is applied below the ground surface which allows raising the water table at an appropriate depth for the crop. Installing a subirrigation system usually is less than a subsurface drainage and surface irrigation system together on the same field.

MU Drainage and Subirrigation Results From Northeast Missouri—Dr. Kelly Nelson and Randall Smoot

Corn and soybean planting date was delayed on an average of 2.5 days for the non-drained control compared to drained soils from 2002 through 2010.

Drainage increased average corn yields 20%, drainage plus sub-irrigation increased corn yields by 40% compared to the check from 2004 to 2010.
Overhead irrigation increased corn yield 5% compared to drainage/subirrigation with 20 foot laterals. However, applied water was on average 4 times greater for overhead irrigated corn compared with drainage/subirrigation corn on 20 foot tile spacing from 2004 through 2007.

Soybean grain yield with drainage averaged 20% greater than control. Drainage with subirrigation increased grain yields 22% greater than non-drained controls.

Components of Designing a System

Identify grower needs, whether drainage or for drainage and subirrigation. Each goal may require a different design. The following is a brief list of steps necessary for creating a design.

1. Create a topographic map of the area using a 1 foot contour interval.
2. Determine the soil series in field.
3. Determine the drainage coefficient.
4. Identify the lateral spacing.
5. Size the main and plot the profile of main and key laterals including outlet elevation and grade of main and locations of any changes in grade.
6. Layout the system indicating sizes and length of mains and laterals.
7. Complete table of quantities and estimated cost of materials for trenching.

If you would like to be added to our electronic mailing list, please contact Charmaine Flint, Holt County Secretary at 660-446-3724.

Information contained in this newsletter is intended for use in Northwest Missouri and may need to be adapted to other locations. We ask that you credit University of Missouri Extension if you use this information.