ADMC Agricultural Drainage Management Coalition

Couser Modern Farm Experience

Mission

Integrate modern agronomic and conservation practices to maximize crop production and environmental performance while being a showcase farm to educate and communicate with farmers and consumers. The management of innovative practices and quantification of benefits will serve to advance the Iowa Nutrient Reduction Strategy and promote acceleration and adoption of the practices.

Background

The family has worked closely with Bayer to be a showcase for a livestock integrated row crop farm. The Couser farm is located near the Iowa Farm Progress Show, making it a great location to host interested groups. Current practices showcased on the farm include reduced tillage, nutrient and residue management, cover crops, and pollinator habitat. To consistently maximize the production potential of the farm, the Cousers are moving to install a pattern tile drainage system. Since the farm is a showcase of modern farming practices, they are looking to implement the latest conservation drainage systems to take advantage of the crop production benefits as well as improving the environmental performance of pattern tile drainage.

The farm

Consists of approximately 180 acres of row crop production distributed between 4 fields of varying potential. The farm also contains grazing land, hay production, remnant prairie, and a recently planted pollinator habitat.



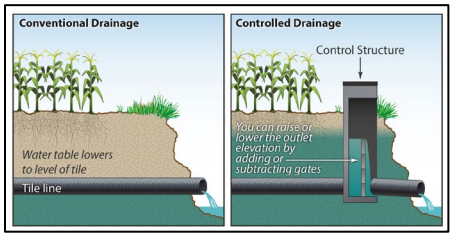
Investment in patterned tile drainage

Pattern tile drainage has proven to be one the best investments for improving the production value of crop ground. Adequate drainage has consistently increased yields 20-30% by removing excess moisture in a timely manner. Moving beyond increase yield, pattern tile systems offer the opportunity to collectively manage agricultural water by implementing conservation drainage practices.


Conservation drainage practices

Automated drainage water management

Manages the water table with control structures that can be remotely operated. This allows water to be stored in the soil profile during times of the year when the crop is growing with a water deficiency or during the fallow season when drainage is not needed. The reduced drainage volume decreases the amount of nitrate that is discharged by 33% and can also reduce dissolved phosphorus discharges by nearly 50%. The practice best applies when there are large portions of the field with slopes ranging from 0.5%-1% and where the drainage system is installed to follow the elevation contours. The difference in costs associated with conventional and automated drainage water management are approximately $50 per acre.




Saturated buffers

Modify the typical drainage outlet by intercepting the tile at the field edge and distribute the water to the adjoining filter strip/riparian buffer's soil profile via a lateral tile line. Sites need to have at least 30 feet of perennial vegetation, soil organic matter >1.2%, stable stream banks, and an absence of sand or gravel layers. When sited properly, research has shown that saturated buffers can remove 22-44% of the nitrate load. A saturated buffer will typically cost $3,000-$5,000.



Bioreactors

Redirect a portion of the tile discharge through an excavated soil chamber containing wood chips. The wood chips provide a carbon source which spurs denitrification. The practice is flexible and can fit in most landscape positions if there is approximately 100 feet by 20 feet available. Monitoring has shown bioreactors to remove an average of 20-42% of the nitrate load and have an average installation cost of $8,000-$12,000.