AGRI-BUSINESS STEWARDSHIP

NEWSLETTER

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The objective of this document is to provide you with current and helpful information regarding water protection, and the Michigan Agriculture Environmental Assurance Program (MAEAP).

Modern tile drains, control structures provide new solutions to improve yields, reduce nutrient losses

Tile drain systems are an essential part of agricultural production in many areas of Michigan. Because many plants don't grow well in saturated soil conditions, draining excess water from a field is a key management practice in many regions. By managing the water content of the soil, aeration is improved, infiltration increases, soils warm faster in the spring, and microbial activity is increased. The depth and spacing of tile drains are tailored to site conditions, providing a straightforward tool that allows farmers to easily control the water content of soil.

For more than a century, tile drains have been installed in fields to lower the water table, sometimes by several feet. In many areas of Michigan, particularly lakebed soils, agricultural production would not be possible without artificial drainage. What began as clay tile segments manually placed in hand-dug trenches has evolved to continuous plastic tile placed in the ground with minimal surface disturbance, guided by GPS systems. These new techniques have greatly improved the efficacy of these systems and have greatly improved crop yields.

Because tile drain technologies are constantly evolving, it's important to fully understand how system upgrades may improve management. For example, farmers and crop advisors should investigate the potential use of control structures at the end of tile drains. These structures, which are becoming more and more common, control the time and quantity of water release. During seasonally dry periods, more water can be held in the field, improving crop growth. During winter months when no crops are growing, water can be retained in the field, improving groundwater recharge and reducing the potential for nutrient losses. New research is finding the majority of phosphorus losses occurs during the winter months, making this technology a simple, straightforward measure to reduce nutrient loss. While many control structures can only be placed in very flat terrain, new advances hold promise to increase their use in non-traditional areas.

Tile drains have also become part of a suite of advanced, site-specific agricultural technologies that optimizes farming across the board. For example, tile drain management systems are available that use swarm intelligence-based computer operating systems – being designed and deployed with built-in forecasting systems that drain, hold, and add water back into systems as needed to maintain an optimal water environment in fields.

When installing new tile systems or retro-fitting old systems, new technologies today offer the opportunity to increase crop production while reducing environmental impacts. Tile drains are based on simple technology that's been around for centuries – but like everything in agriculture, drain systems have rapidly evolved and present new opportunities for modern farming.

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