The WATER GATE

Conserve water. • Increase yields. • Reduce nutrient loss.

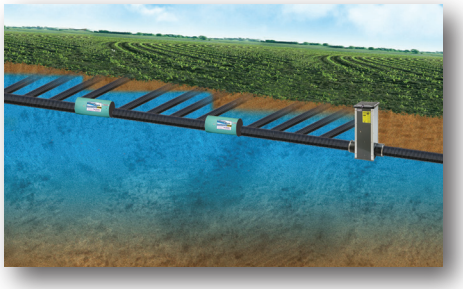
Enjoy the agricultural and environmental benefits of *VARIABLE RATE DRAINAGE*® with Agri Drain's Water Gate.

The Water Gate is a float-activated head pressure valve. It maintains a one-foot increase in water elevation between the downstream and upstream sides of the valve.

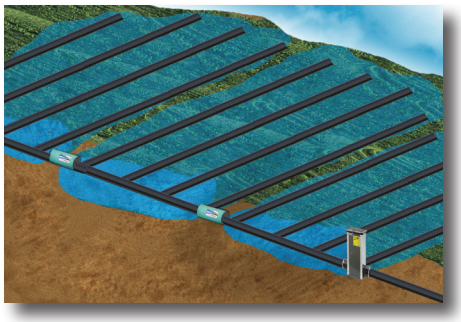
The Water Gate operates in either free-flow or managed-flow mode. The managed-flow mode is activated by backing water up into the valve. This is accomplished by installing a Water Level Control Structure (WLCS) in the tile main at the lowest point of the drainage system that you wish to manipulate or control. Locate the first Water Gate one foot in elevation upstream from the WLCS. Water Gates can be used in series, locating additional units at one-foot elevation intervals.

- Manage up to 10"-diameter subsurface drain tile.
- Fully automatic.
- Float operated.
- Infinitely variable.
- Completely buried to allow for convenient field operations.
- Installation using flexible couplers on the upstream and downstream sides is recommended.
- Valves are not pressure rated.
- Valves are intended for gravity flow: Low pressure and some seepage may occur.*

*To minimize seepage, we recommend installing 20' of non-perforated pipe on the upstream side of the Water Gate, or using an Anti-Seep Collar below the Water Gate.



Side view of how Inline Water Level Control Structure™ and Water Gates "stair-step" water up through the soil profile.



Top view showing the zones of influence that each device manages.

U.S. Patent No. 7,942,606 B2
Canadian Patent No. 2,675,810

Agri Drain CORPORATION

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USING INLINE WATER LEVEL CONTROL DEVICES FOR IMPROVED DRAINAGE WATER MANAGEMENT

Norm Fausey, Mark Williams, and Kevin King
USDA-ARS Soil Drainage Research Unit, Columbus, OH

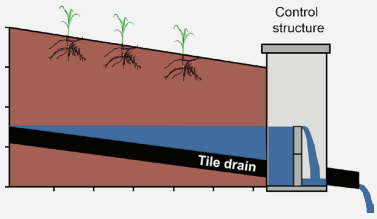
OVERVIEW

Phosphorus (P) and Nitrogen (N) loadings to surface waters have been identified as a major water quality issue in Ohio.

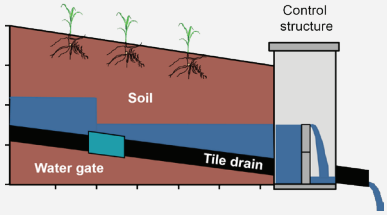
Drainage water management (DWM) has shown to substantially decrease N and P loadings in artificially drained landscapes.

DWM has generally been limited to flat fields (<0.5% slope) due to small effective areas on fields with steeper slopes.

Drainage Water Management with an Outlet Elevation Control Structure



Drainage Water Management with an Outlet Elevation Control Structure + Inline Water Gate Device

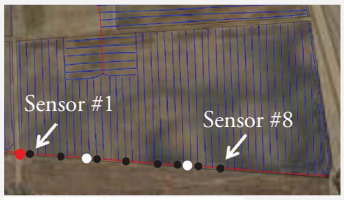


Water level control devices "stair-step" water up through the soil profile.

OBJECTIVE

Demonstrate the use of an outlet elevation control structure + inline Water Gate device for improved water table management.

DEMONSTRATION SITE



Tile Lateral
Tile Main
Outlet Elevation Control Structure
Water Gate Device
Water Level Sensor

Located at Farm Science Review

The Water Gate ™

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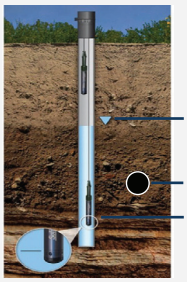
Water Elevation Measurements



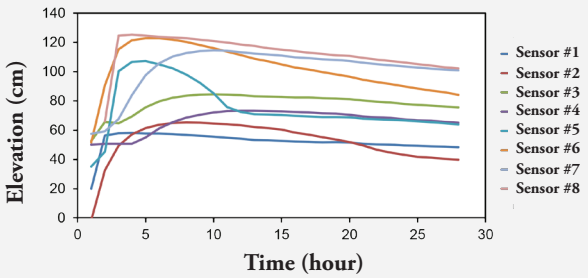
Fully automatic, completely buried, and can be used in series.

Maintains a 1-ft. increase in water elevation between the downstream and upstream side of the valves.

Water elevation was measured using a Solinst Levelogger, hourly, at 8 locations along the tile drain.

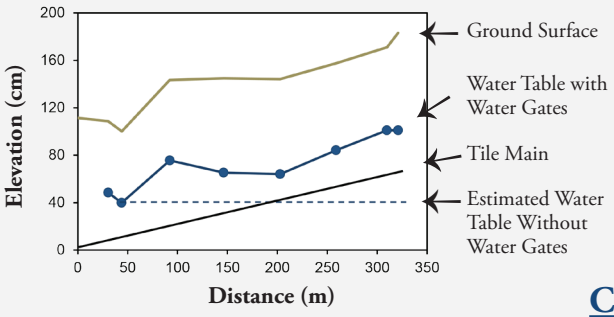
RESULTS

Water Table Dynamics During a Rainfall Event on 6/14/2015

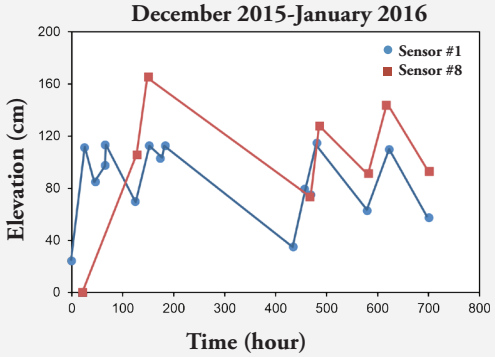


RESULTS

Water table at 10 am on 6/14/2015



Water Table Dynamics From December 2015-January 2016



CONCLUSIONS

Water Gates effectively "stair-step" water up through the soil profile, which increases the effective area of DWM.

Using an outlet elevation control structure + inline Water Gate device increases the amount of acres suitable for DWM across the Midwestern U.S.

Future research is needed to determine if using an outlet elevation control structure + Water Gate device decreases the amount of nutrient loading compared to only using an outlet elevation control structure.