

Fallacies of MODFLOW Modeling

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Fallacies of MODFLOW

1. Water infiltration and redistribution
 - a) irregular and unpredictable
 - b) In space
 - c) Over time

2. Darcy's Law
 - a) Linear flow over time as function of conductivity
 - b) Flow through cross sectional area over time
 - c) Non-linear multidirectional flow modified by differential calculus with derivatives

3. Model verification and validation do not relate to real life ground water flow
 - a) How do you verify infinitesimal derivatives of the unknown
 - b) How do you validate against constantly changing soil and geology
 - c) DOE provides an 8 test package to verify and validate at installation as if 8 possible test options will represent the infinite number of possible soil, geology, and matrix solution configurations.

Source: J. L. Osiensky and R. E. Williams (1997). Potential Inaccuracies in MODFLOW Simulations Involving the SIP and SSOR Methods for Matrix Solution Groundwater, 35: 229-232. Doi: 10.1111/j.1745-6584. 1997.tb00079.x

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4. Surface water to groundwater connections
 - a) May be unseen cumulative numerous small discrete connections.
 - b) Re-defined by Justice Kennedy, U.S. Supreme Court, in *Rapanos vs U.S.*, 126 S.Ct. 2208 (S.Ct. 2006), to be the cumulative effect of hydrological and geological connections upon the chemical, physical, and biological integrity of navigable waters.
 - c) Connections such as these evolved in the southern clay pan Post Oak Savannah soil system between the Navasota Ladies'-tresses orchid (*Spiranthes parksii*) and mycorrhizal fungi. Agri-business in our region is dependent upon this symbiotic relationship between vascular crop plants and fungi with conducive soil moisture.

Source: Kusler, J., P. Parenteau, E. A, Thomas. Significant Nexus and Clean Water Act Jurisdiction. Discussion Paper, Association of State Wetland Managers, Inc. March, 5, 2007.

Germinating Navasota Ladies'- tresses (*Spiranthes parksii*) seed with mycorrhizal symbiosis – a bioindicator species for:

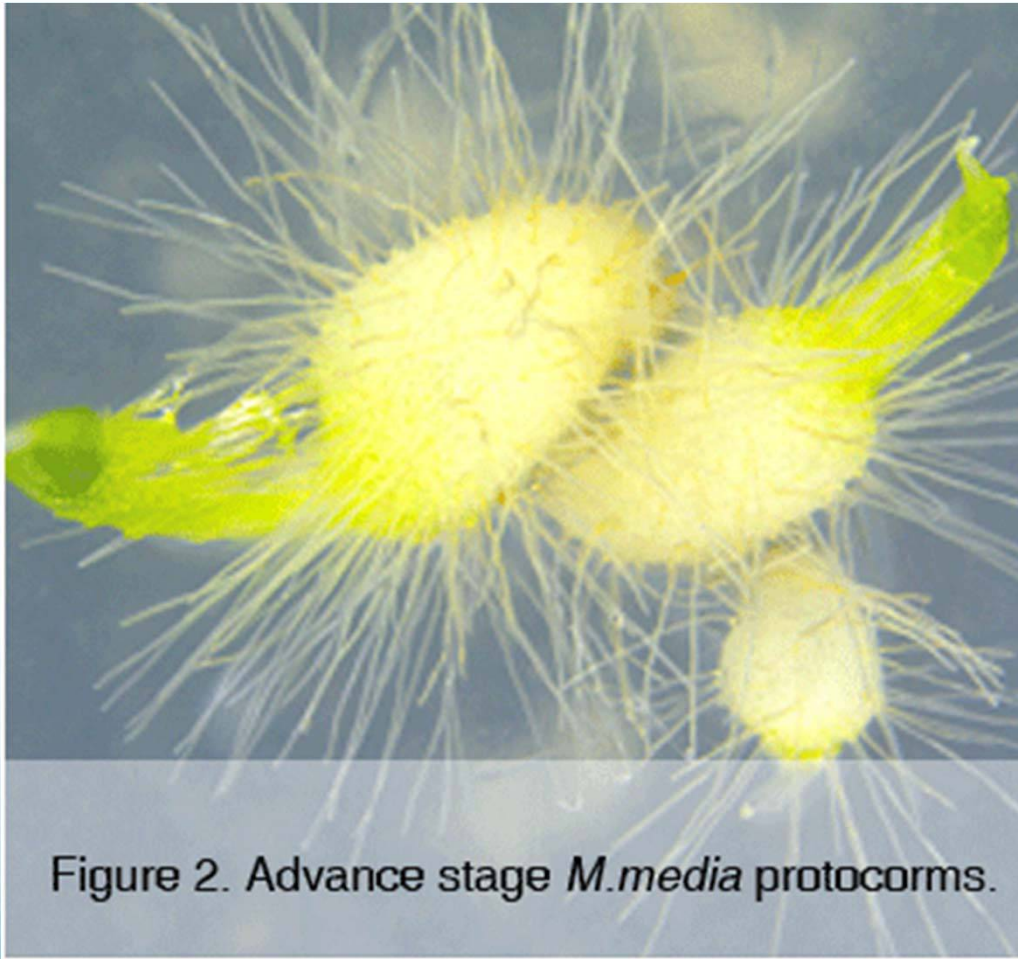


Figure 2. Advance stage *M.media* protocorms.

Fungi and water in time and
place for symbioses with:

85% of vascular land plants

Clover

Wheat

Legumes

Oak trees

Pine trees

Christmas trees

Blueberries

Indicators of

Soil Moisture

Pollution

Habitat Destruction

Environmental Health

Public Health

Public Safety

Just say NO to SAWS and Vista Ridge!

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Thank you for saving our land and water.

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