

**JOE RITCHIE TRIBUTE**  
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**MODELLING SOIL WATER**

**Issues that are of concern**

- Including effects of water tables (w.t.) into models
  - In SWAGMAN Destiny we have a defined profile (need deeper profiles to locate w.t. over time), assigned effective  $K_e$  at lower boundary
    - + input depth to w.t.,
    - + upflow calculated from  $\Delta\theta$  and diffusivity term
- $$D=f(LL-\theta)$$
- Uptake of water from shallow water tables
  - + mostly use by plants, as survival rather than production – speculation is that this is a root signal from dry layers, or nutrient limitation
- Effect of mulches
  - + DSSAT tillage module available early 2001.
- Water flow from regional groundwaters becomes a concern for initialisation of spatial application
  - must have piezometric head and ? and slope.
  - What effective transmissivity conductivity should be used in horizontal direction (Bruno tomorrow)
  - Drainage in vertical layers – modify from 0.5 Ayman Suliman
- Root growth responses to aeration (refer to work of Meyer, Lisazo, Asseng)
- Change in ponding/infiltration partitioning – should this be dynamic during season?
  - change in ponding depth – surface roughness
  - slaking, litter breakdown or accumulation

**Question about landscape behaviour**

- Tension between addition of point scale models predictions and those from hydrology/groundwater – distributed models
- Dealing with variability
  - use models in an inverse method
  - use integrative methods (Bill Batchelor and Bruno)
- Preferential flow
  - would like to account for but have no way of parameterising
- Why not use Richard's equation?
  - still cannot get parameters (modelling is easy, getting good data is hard)
- Plea for combined effort on surrogate/new forms of measures
  - EM, ground penetrating radar
  - Remote sensing, IR, Thermal.