FOOTPRINT

Defining agro-environmental representative scenarios for the whole of the EU

Kick-off meeting
Friday 24 February 2006

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Spatial Zonation - Objectives

- Develop and apply a methodology for defining generic scenarios for characterising the complete spectrum of European agricultural environments.
- Scenarios must be capable of being applied at European/regional, catchment and farm/holding level.
- Each scenario will have a default set of long-term weather data; soil property data; unsaturated & saturated zone transfer coefficients; agronomic data.

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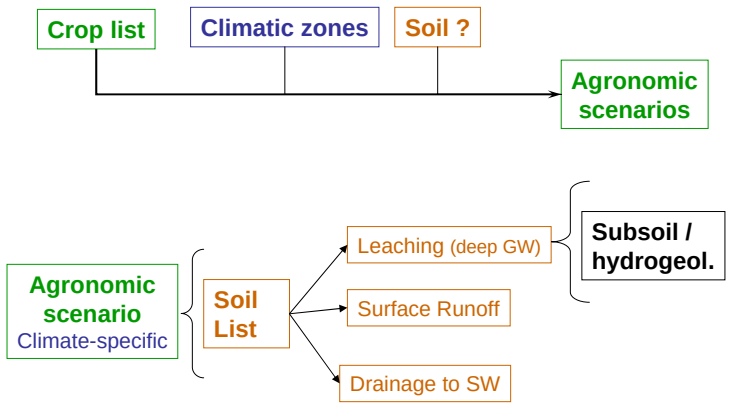
European level Data Sources

- European Climate Assessment Dataset (resolution?)
  MARS climatic dataset (50 km x 50 km).
  Climate Research Unit (CRU) Baseline Dataset (0.5º x 0.5º)?
- CORINE 2000 Land Cover (250m x 250m).
  Eurostat REGIO agricultural statsistics (NUTS level2).
- European Soil Geographic Database (1:1M spatial).
  USGS topographic HYDO_1K Database for slope.
- European Groundwater Resources Database (1:500,000).
  N.B. Not all European countries.
  1:1,500,000 hydrogeological maps of Europe (paper only!).
- European surface hydrology at 1:250,000 scale?

Scenario Development
A hierarchical approach



22(+?) Crops

- Grass
- Lucerne
- W. Wheat
- W.Barley, oats, etc.
- W. Oilseed Rape
- Sp. Barley, oats, etc.
- Sp. Oilseed Rape
- Field beans
- Peas
- Potatoes
- Sugar beet
- Maize
- Sunflowers
- Vegetables (3 classes?)
- Hops
- Cotton
- Tobacco
- Vines
- Pome fruit
- Stone fruit
- Citrus
- Olives

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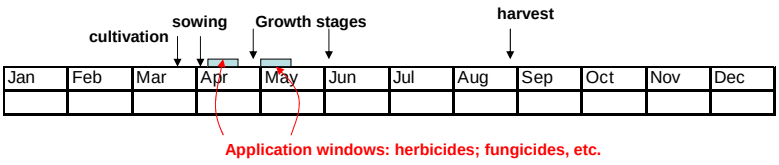
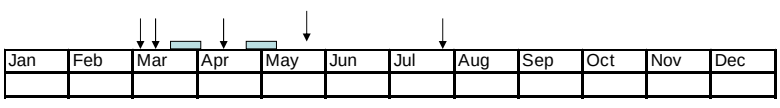
Agronomic scenarios

Spring barley, oats etc. north climate zone



Spring barley, oats etc. south climate zone



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Climatic Zonation

- Sensitivity analysis to determine most critical climatic parameters (for the models!)
- Leaching: Temperature; Rainfall during the 'leaching period'.
- Surface runoff: & field drainage: Temperature; Frequency of specific daily rainfall events within months.
- Derive relevant values for each dataset & apply Principal Component Analysis to identify homogeneous zones.

Locating crops
(FOOT-CS & FOOT-NES)

- CORINE 2000 to identify 'agricultural' land.
  Non-irrigated arable; permanently irrigated land; rice fields; pastures; vineyards, fruit trees; berry plantations, olive groves; annual crops & permanent crops; complex cultivation patterns; principally agriculture but significant natural vegation.
- EUROSTAT Regio agricultural statistics at NUTS level 2 to:
  Confirm broad categorisation of CORINE classes (supplemented by national agricultural statistics e.g. Greece).

  Locate specific arable or permanent crops within relevant CORINE groupings.

Representative Soil Scenarios

- Define soil hydrological characteristics:
  HOST attributes; CORPEN soil attributes; Textures.
- Define sorption attributes:
  Organic matter profiles; Mineralogy profiles; Sesquioxide (Fe & Al) profiles; pH??; Textures??
- Combine to define hydro-chemical classes.
- Assign classes to each STU in SGDBE using stu,dbf attributes.
- Use SPADE-1 and SPADE-2 databases to derive model parameters for each hydro-chemical class.

Applying Substrate characteristics

> High leaching to shallow groundwater ><contamination risk of the deep aquifer (drinking water)

> FOOTPRINT will provide

- Default set of data
- Possibility for the user to include local data

> How to do this?

- Simple approach (transfer coefficient)
- Gather available information within EU
- Use of groundwater classification done within the WFD

Numbers of scenarios ?!

- > 10 – 12 climates
- > 25 crops
- > 25 soils?
- > 3 substrates (high, moderate, low attenuation)?

Assume 12 crops over 8 climate zones & 13 crops over 7 climate zones and all 25 soils and all 3 substrates cover each agro-climatic combination.

= 187 x 25 x 3
= 14025

Estimates vary between 10000 and 90000
-> implications on the modelling!

Application at different Levels