

# Collaborative Weed Modelling

A workshop held in Kaposvár, Hungary, 16 July 2010

## Program

### *Teacher and Facilitator*

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### *Admission*

Free for all, as long as we have room. Please notify me if you intend to participate. It is all right to decide in the very last moment but still, please, send a notification. It helps planning the details of the workshop.

### *Schedule*

The workshop runs from 9:00 to 17:00. You can leave earlier than 17:00 but should not meet later than 9:00. If we find nothing better to do, we may choose to extend our work into the evening.

The location of the meeting room will be announced during the preceding EWRS Symposium.

### *Preparations*

You do not need to have previous experience with modelling to gain from this workshop. More experienced modellers will, however, obtain a deeper level of understanding from the workshop than the novice.

You do not need to be a mathematician either. The mathematics used consist of simple equations describing biological relations.

If you bring your own laptop you will have the benefit of bringing home the models that we work on. Otherwise you can download them later on on your home computer. Participants bringing a laptop should be prepared to welcome a partner to share the computer during the workshop.

You can download a working copy of the software that we will use at the workshop, *Universal Simulator (UniSim)* obtainable for free from [www.ecolmod.org](http://www.ecolmod.org). However, the software is under development, and you will likely need to install the very latest version at the beginning of the workshop anyway.

Currently, UniSim runs only under Windows. Linux (Ubuntu) and Mac OS versions are scheduled for late 2010.

A book *Universal Simulator Explained* is being written. The chapters on plant modelling will be added before the workshop (last corrections likely to occur even during the symposium!). You can download a copy of this work in progress also from [www.ecolmod.org](http://www.ecolmod.org).

You are welcome to study the references given below before the workshop, but you are not obliged. In short, you do not need to make any preparation at all!

### *1. Who are we?*

Short presentation round.

### *2. We are computers!*

To get a feeling for models and computers we will all act as computers. Each of us will play the role of a particular sub-model of a plant model. Together we will make the plant grow, hopefully not crash!

While we are computers, we will have the real computers running and installing the latest version of UniSim.

### *3. The Conductance Model for plant growth under competition*

- Theory: Biology and Mathematics
- Exercise: Parameter estimation.
- Theory: Implementation in UniSim.
- Exercise: Simulations in UniSim.
- Literature: Benjamin, L. R. and S. E. Park. 2007, The conductance model of plant growth and competition in monoculture and species mixtures: a review. *Weed Research* 47:284-298.

### *4. A model of annual weed population dynamics (unpublished)*

- Theory: Biology and Mathematics
- Demonstration: Implementation and simulations in UniSim

### *5. The INTERCOM Model for plant growth under competition*

- Theory: Photosynthesis and Mathematics
- Demonstration: Implementation and simulations in UniSim
- Theory: Allocation and Mathematics
- Demonstration: Implementation and simulations in UniSim
- Literature: Kropff, M. J. and H. H. v. Laar, 1993. *Modelling Crop-Weed Interactions*: CAB International (Wallingford, UK) and International Rice Research Institute (Manila, The Philippines). Free copy at [books.irri.org/getpdf.htm?book=0851987451](http://books.irri.org/getpdf.htm?book=0851987451).

## Acknowledgements

Supported by the ENDURE project funded by EU, International Centre for Research in Organic Food Systems (ICROFS) and the BiosafeTrain project funded by Danida.