

The plant growth and development module of the ORYZA2000 rice model has been linked to DSSAT-CSM which now allows an alternative to the CERES-Rice model within DSSAT. The CERES-Rice model is still the default model in DSSAT and will be called unless the ORYZA model is explicitly selected by the user. ORYZA was added to CSM while minimizing changes to the original ORYZA2000 code so that the model could still be maintained and improved by the model developers at the International Rice Research Institute. For this reason, some of the input file requirements differ from that of other DSSAT crop growth models. This document will define specific requirements for running the ORYZA model within DSSAT-CSM including how to select the DSSAT-ORYZA model for a simulation and special input file considerations.

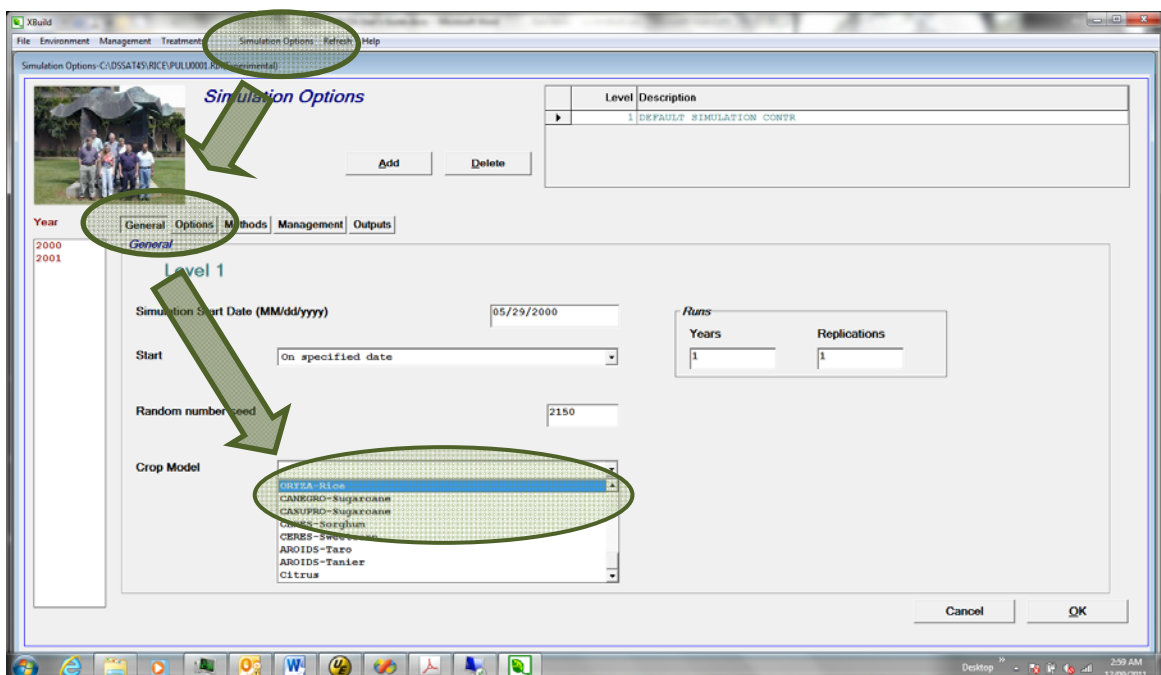
Selecting ORYZA as the crop model for a simulation

There are three ways to select the DSSAT-ORYZA model when running DSSAT:

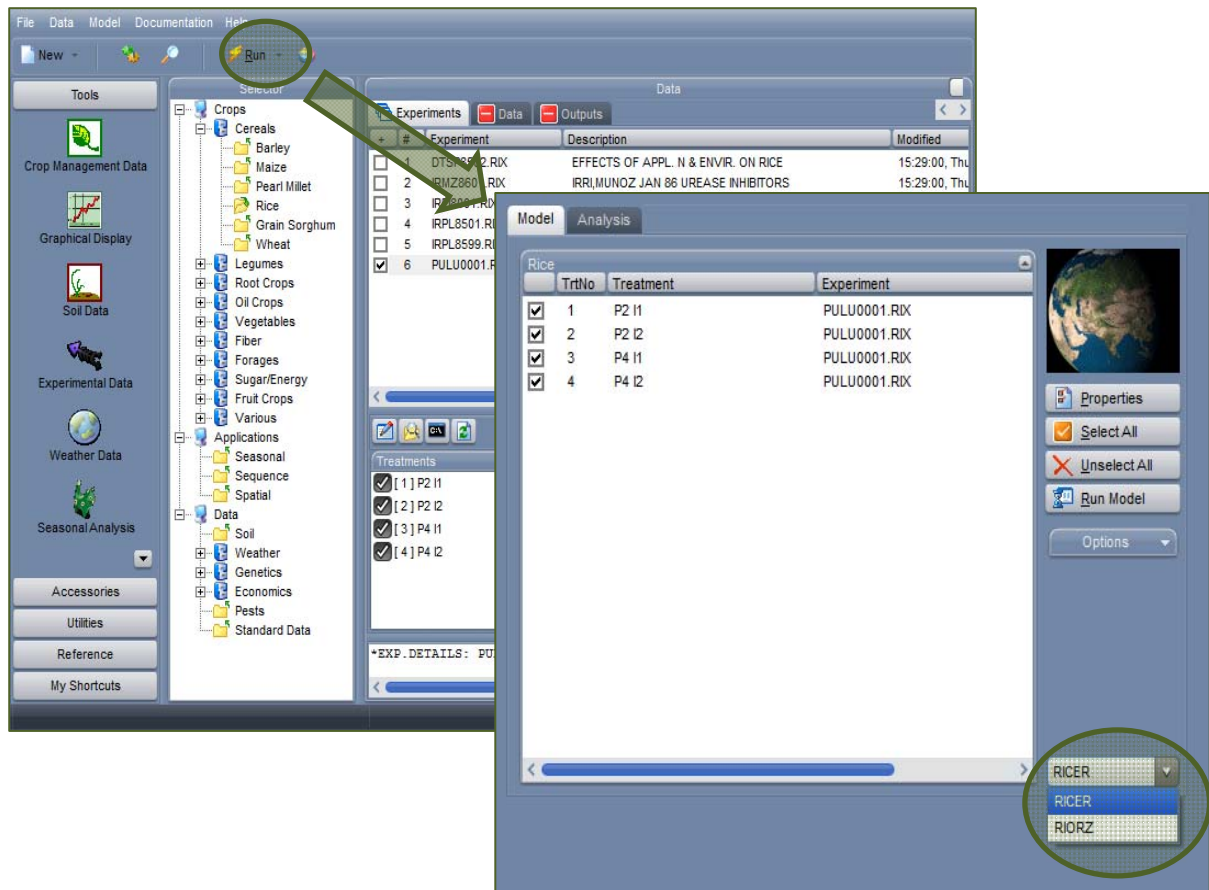
1. In the simulation controls section of the crop experiment file, the model can be specified explicitly.

```
*SIMULATION CONTROLS
@N GENERAL      NYERS NREPS START SDATE RSEED SNAME..... SMODEL
 1 GE           1    1      S 92183  2150 ORYZA W & N simulated RIORZ045
```

This option can be edited manually in a text editor or selected when editing the experiment file within the XBuild application. In XBuild, under “Simulation Options”, “General” tab, select ORYZA-Rice from the “Crop Models” pull-down menu.



- When running the model from the DSSAT shell, in the Run dialog box, the user can select the ORYZA crop model (RIORZ) from a pull-down menu as shown below.



- An advanced user may wish to edit the DSSATPRO.v45 file to change the default model used for all rice simulations.

MRI C: \DSSAT45 DSCSM045.EXE **RIORZ045**

Cultivar File Specification

Because DSSAT-ORYZA uses exactly the same routines as the separately-maintained stand-alone ORYZA2000 model, the format of the crop data file (*.CRP) does not follow the structure of other DSSAT input files. Nevertheless, these files containing the crop and cultivar information for DSSAT-ORYZA will be stored in the standard DSSAT folders. Like the DSSAT SPE, CUL and ECO files, the model first looks for the CRP file in the data directory (i.e., where the experiment file is) and then in the genotype directory. A DSSAT-style cultivar file is used for DSSAT-ORYZA, which contains a listing of the cultivar code and description, but instead of cultivar parameters, the name of the ORYZA CRP file is listed. As of this writing, only two

cultivars have been added to this file, IR72 and HD297 as shown in the following print of the RIORZ045.CUL file.

```
*RICE GENOTYPE COEFFICIENTS: RIORZ045 MODEL
!
! COEFF      DEFINITIONS
! =====
! VAR#       Identification code or number for a specific cultivar.
! VAR-NAME   Name of cultivar.
! EXPNO      Number of experiments used to estimate cultivar parameters
! ORYZA file name = name of ORYZA2000 crop file
!
@VAR#  VAR-NAME..... EXPNO ORYZA file name
IB0118 IR 72                . IR72.CRP
IB0300 Han Dao 297          . HD297.CRP
```

Interpreting planting, transplanting and emergence dates for the ORYZA model

The definitions used for planting, transplanting and emergence dates differ somewhat from those used for CERES-Rice in DSSAT. The following table attempts to simplify the conversion.

Definitions	Direct seed		Transplant	
	DSSAT Value	ORYZA variable	DSSAT Value	ORYZA variable
planting type	PLME = 'S'	ESTAB = 'DIRECT-SEED'	PLME = 'T'	ESTAB = 'TRANSPLANT'
start of simulation date must be on or before emergence	YRSIM <= EMYR, EMD	IYEAR, STTIME	YRSIM <= EMYR, EMD	IYEAR, STTIME
planting or transplanting date	YRPLT = emergence date	EMYR, EMD	YRPLT = transplant date	(EMYR, EMD) + SBDUR
duration in seed bed (days)	--	--	PAGE	SBDUR
plant population	PPOP	NPLDS	PPOP = plant population in seed bed	NPLSB
plant population at emergence	PPOE	NPLDS	PPOE = plant population of transplants	NPLH * NH

The ORYZA2000 model simulates the growth of the plants in the seed bed, so for transplanted rice, it is important that the start of simulation date be on or prior to the seeding in the seed bed. For direct seeded rice, ORYZA2000 starts the simulation at the time of emergence and initial plant biomass is specified in an external file.

Specifying initial biomass for direct seeded rice

ORYZA needs the mass of each plant part at emergence when the direct seed planting option is used. These values can currently be supplied in an external file, named identically to the experiment file name except that the last character is "I". For example, an experiment IRPL9203.RIX will have a corresponding initial biomass file of IRPL9203.RII. The file is

optional and default values are assumed if the file is not available. A sample listing of this file is shown below.

```
*EXP. DATA (I): IRCH0301RI China

@I      LAII      GSTI      LWAI      WSTI      RWAI      PWAI      RDPI
1 0.00005      0.0      0.0      0.0      0.0      0.0      0.0001
2 0.00005      0.0      0.0      0.0      0.0      0.0      0.0001
3 0.00005      0.0      0.0      0.0      0.0      0.0      0.0001

! LAII = Initial leaf area per plant (m2 plant-1) (LAPE)
! GSTI = Initial development stage (kg/ha) (DVSI)
! LWAI = Initial leaf weight (kg/ha) (WLVGI)
! SWAI = Initial stem weight (kg/ha) (WSTI)
! RWAI = Initial root weight (kg/ha) (WRTI)
! PWAI = Initial weight storage organs (kg/ha) (WSOI)
! RDPI = Initial root depth (m) (ZRTI)
```