Food and Agriculture Organization of the United Nations

Crop Module 3
Creating crop files

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Content

Day 1

- How do crop models work?
- AquaCrop interface
- AquaCrop: climate and crop modules (AquaCrop modules 1 and 2)

Day 2

- AquaCrop: management and soil modules (AquaCrop modules 3 and 4)
- Run simulations and interpret outputs

Days 2-3

- Input requirements
- Create/import climatic files on AquaCrop

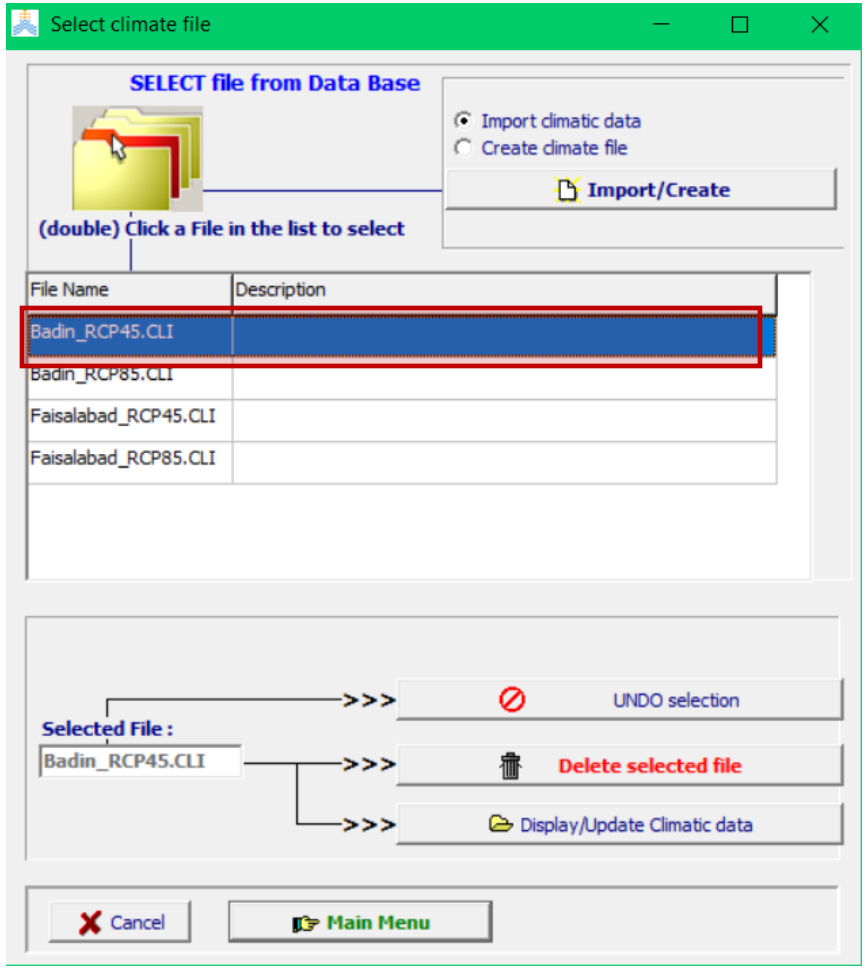
Day 3

- Create a crop file
- Run simulations for wheta in Pakistan (Badin)

Create a crop file: wheat

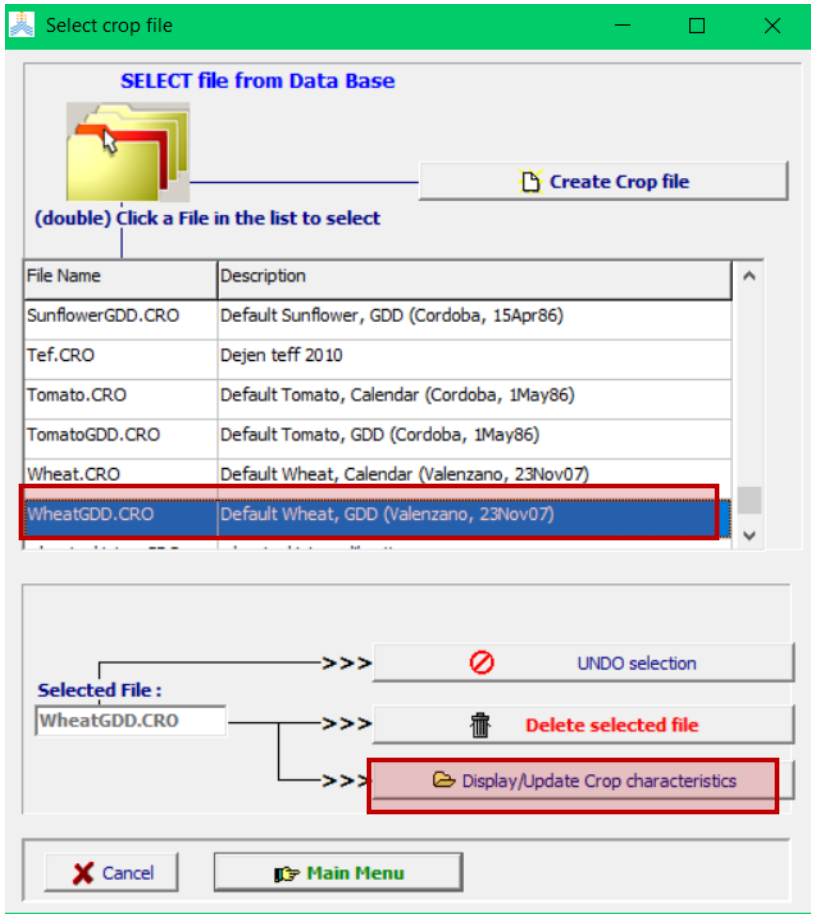
Step 1. Open **AquaCrop**

Step 2. Open the climatic file **Badin_RCP45**



Step 3. Open the default file **WheatGDD.CRO**

Step 4. Click on **Display/Update Crop Characteristics**



Step 3

Step 4

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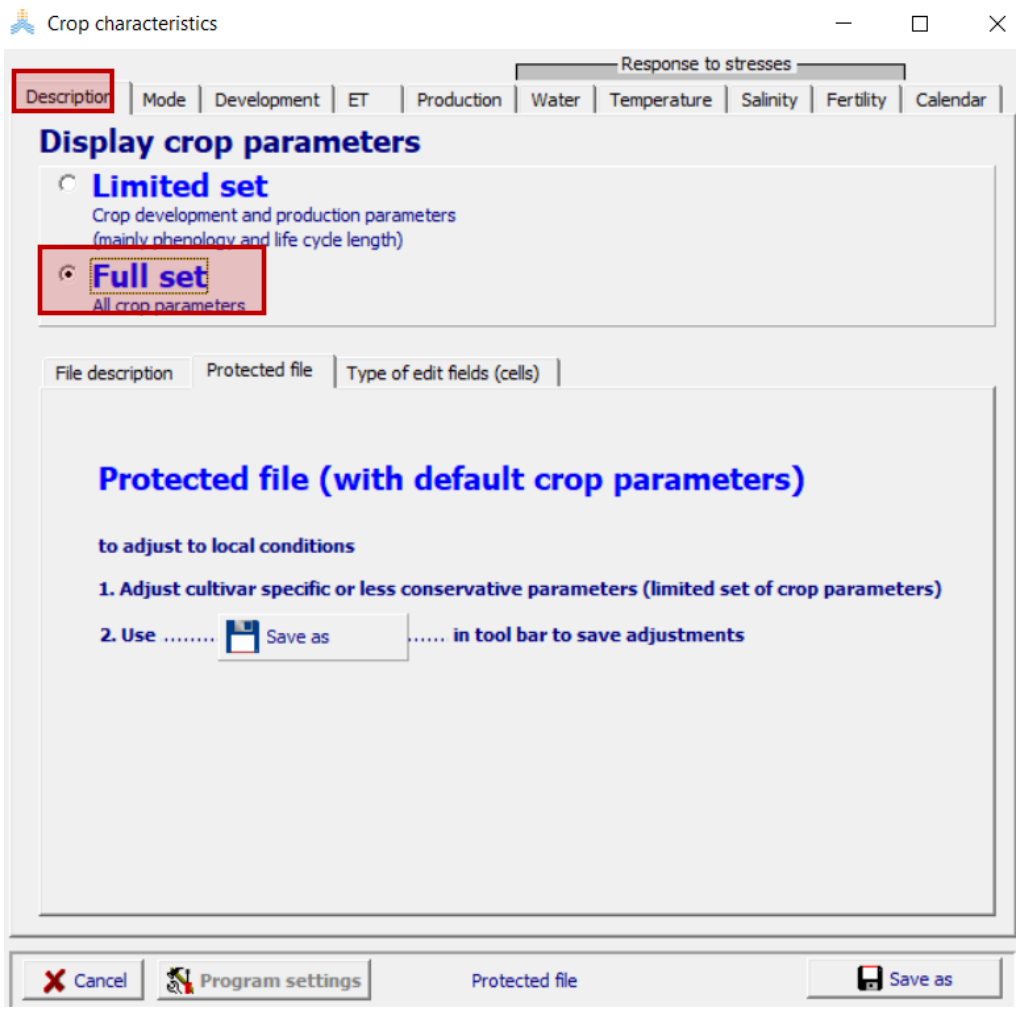
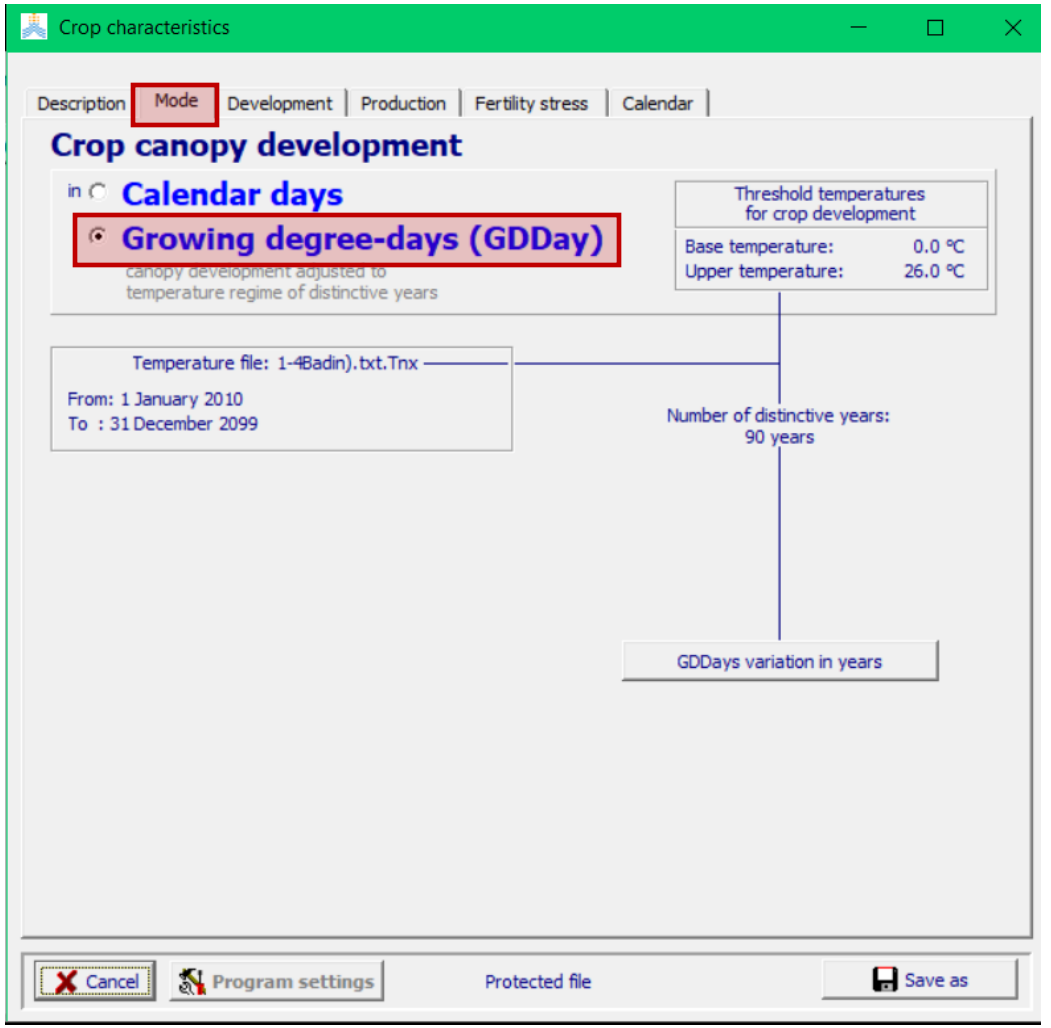
Create a crop file: wheat

Step 1. Click on **Description** and select **Full Set**

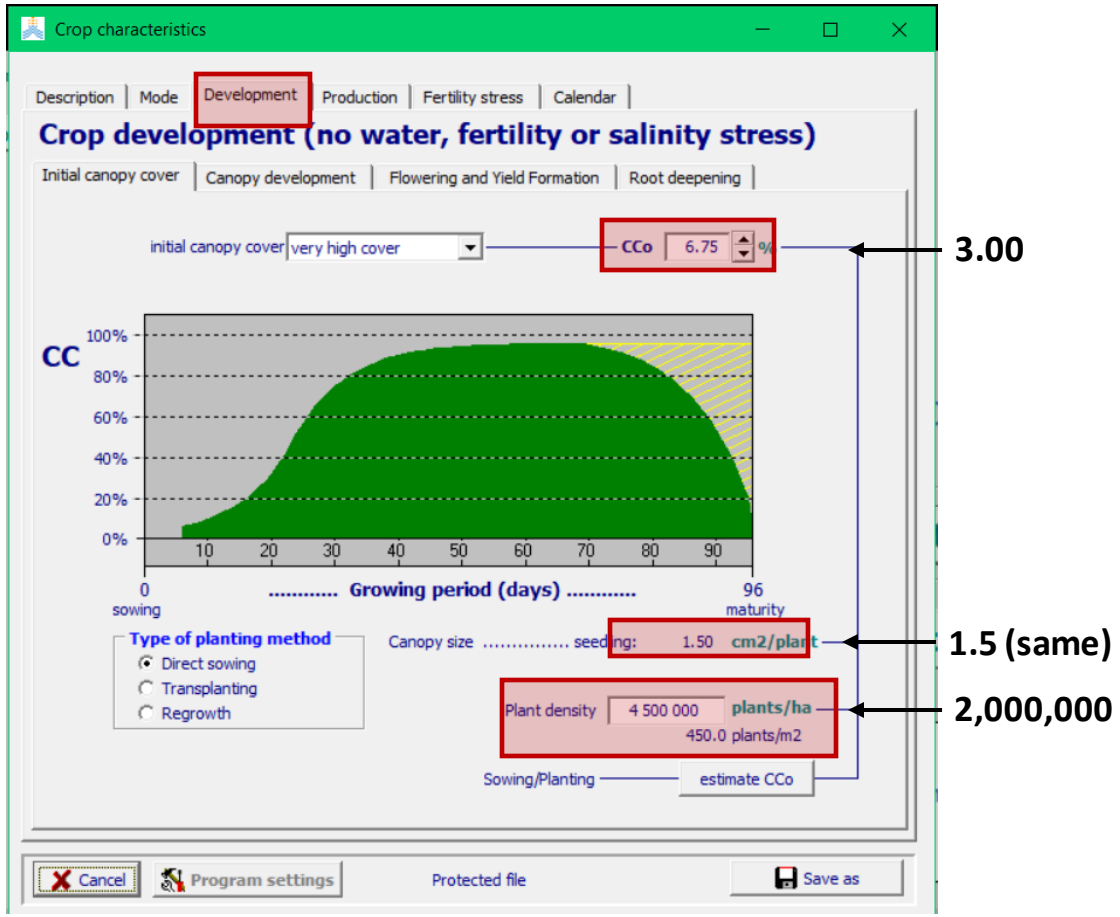


Step 2. Click on **Mode** and select **Growing degree-days (GDDay)**

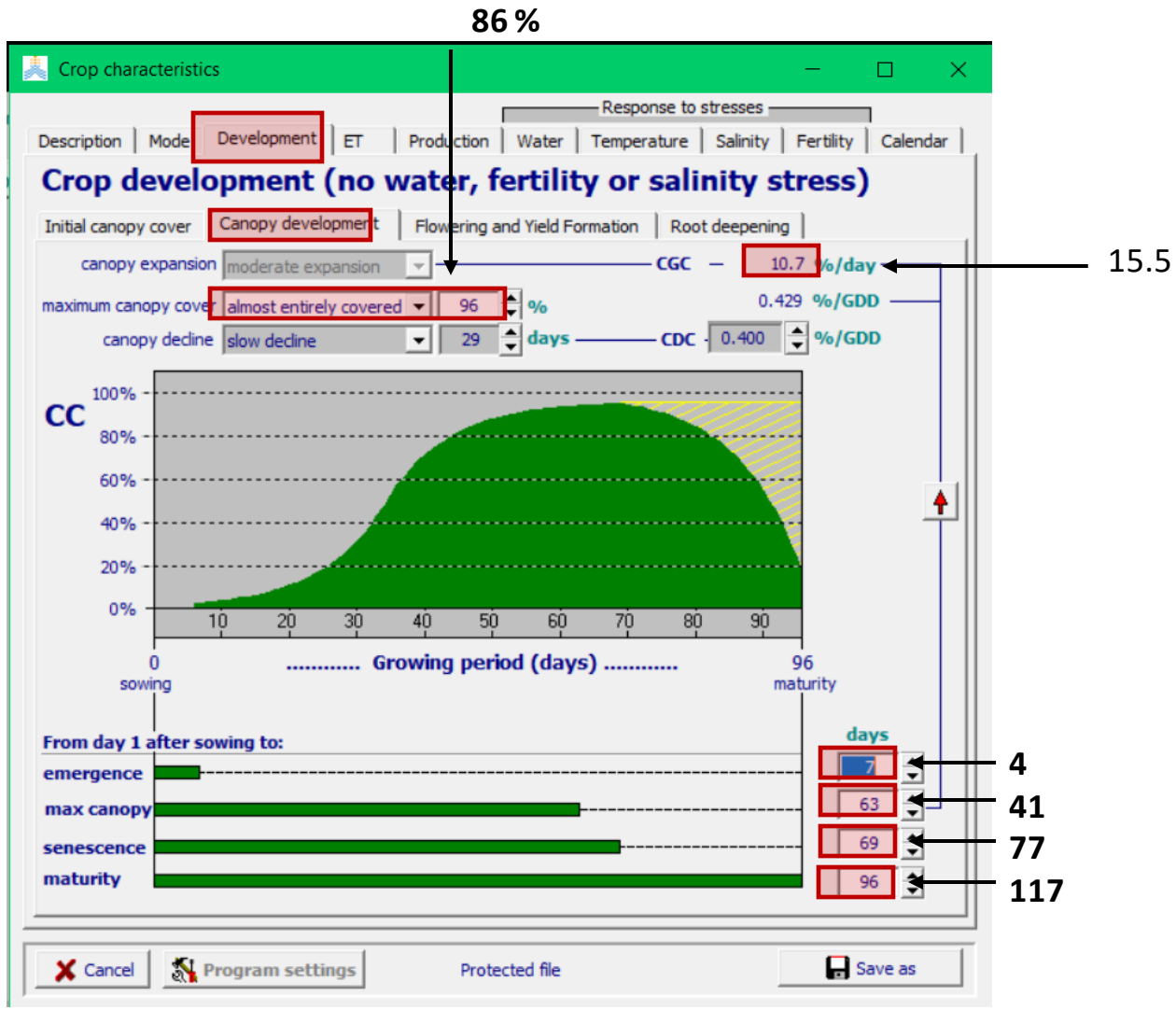


Create a crop file: development

Step 1. Click on **Development** and modify the following **Initial canopy cover** parameters:

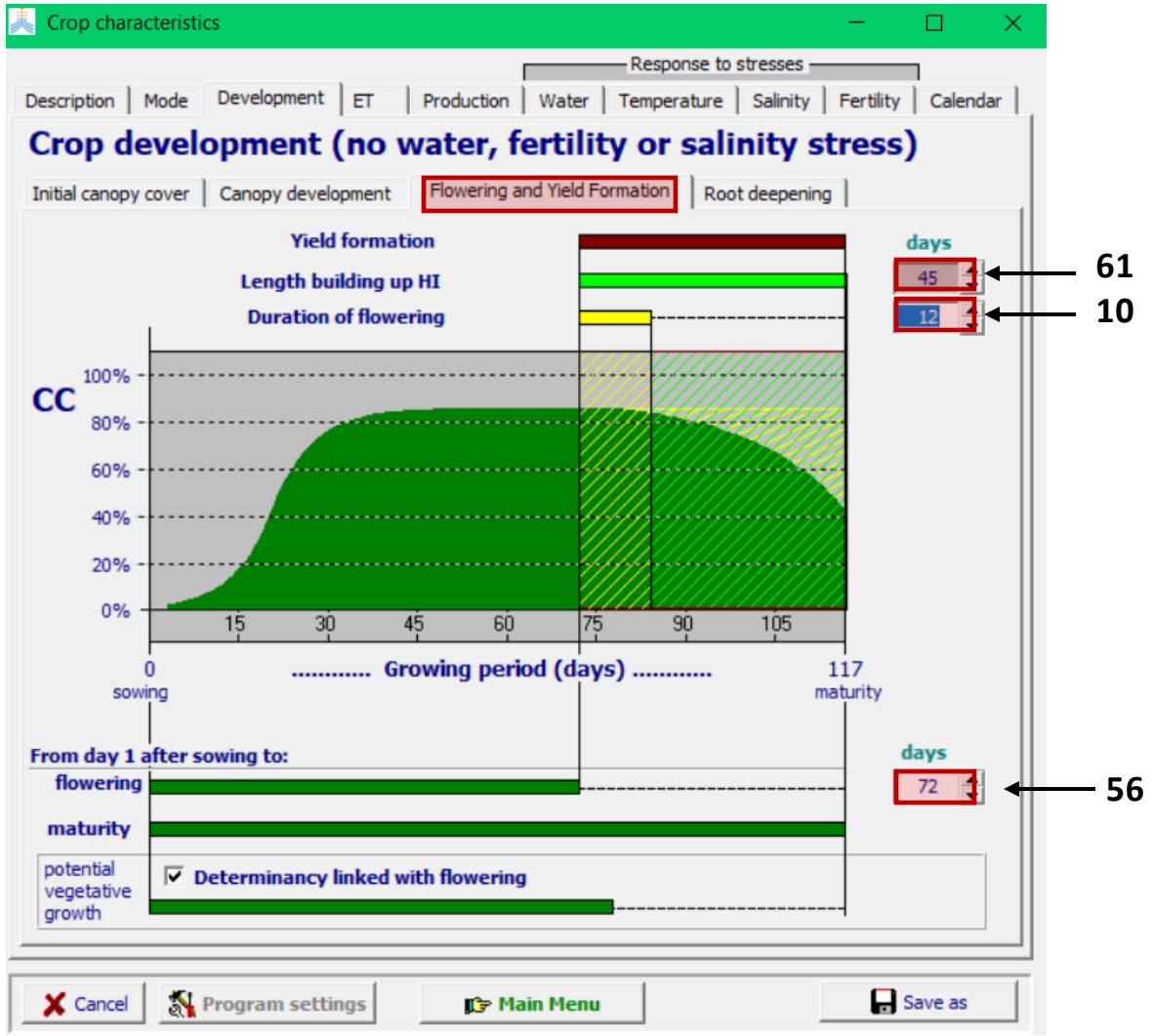


Step 2. Click on **Canopy Development** and modify the following parameters:



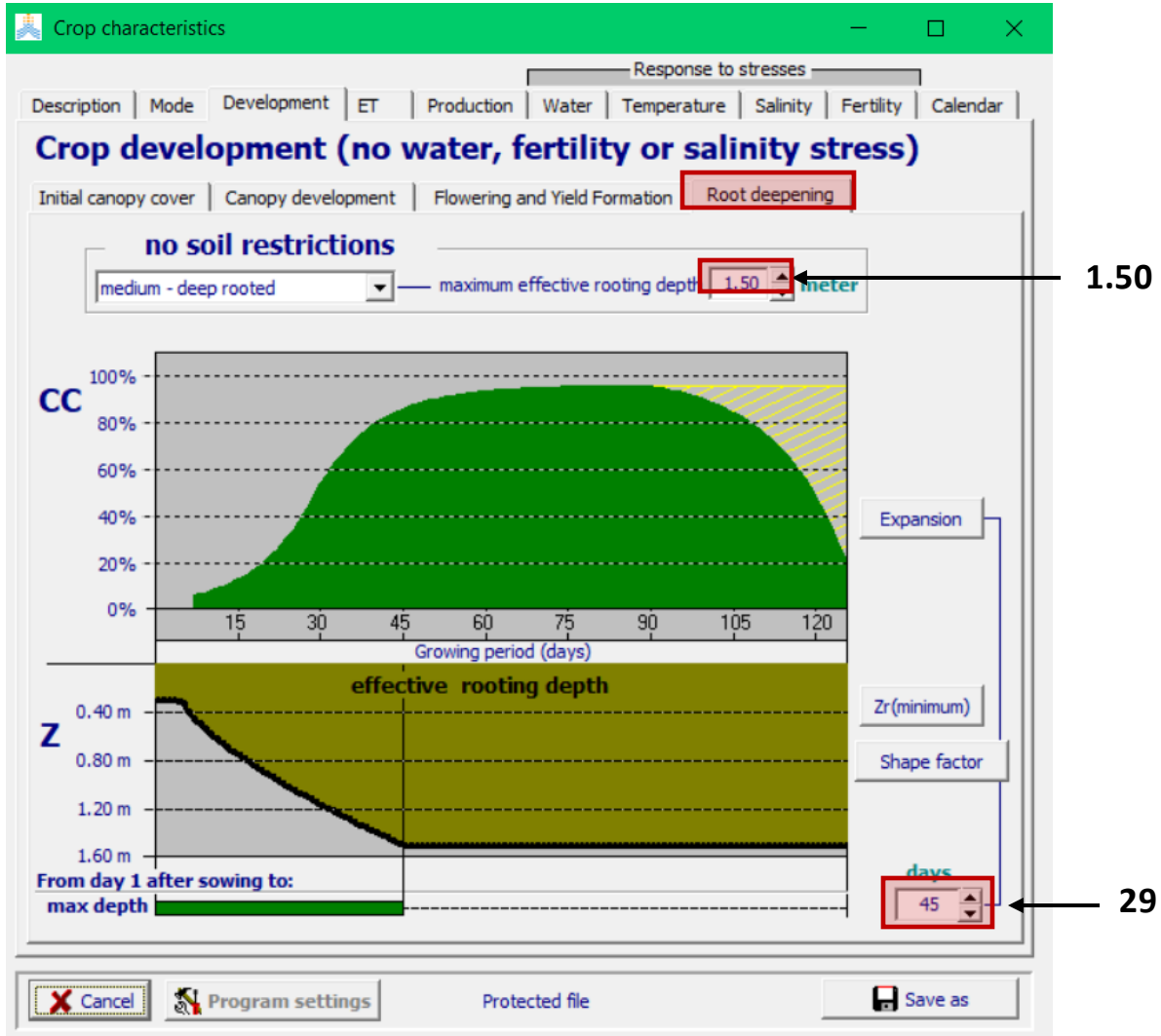
Create a crop file: flowering & yield formation

Step 1. Click on **Flowering and Yield Formation** and modify the following parameters:



Create a crop file: root deepening

Step 1. Click on **Root Deepening** and modify the following parameters:



1.50

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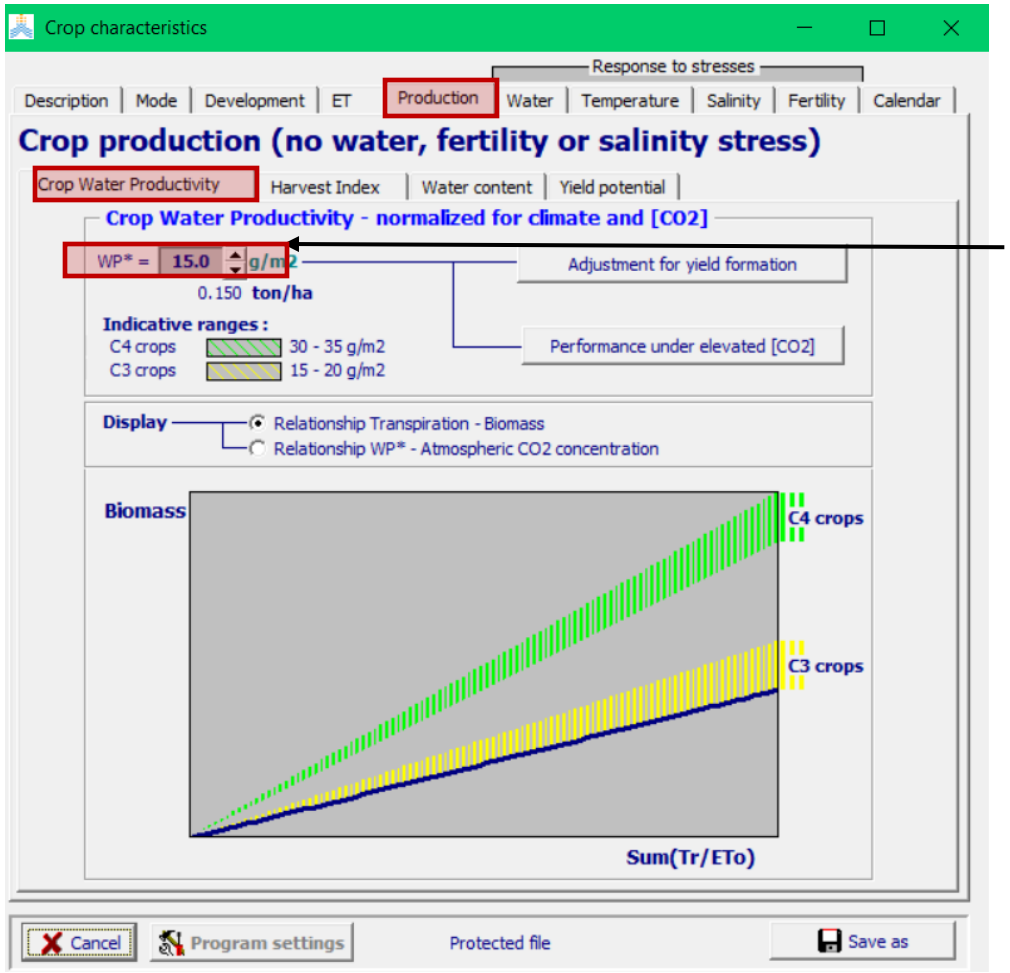
Create a crop file: production

Step 1. Click on **Production** and modify the following **Crop Water Productivity** parameters:



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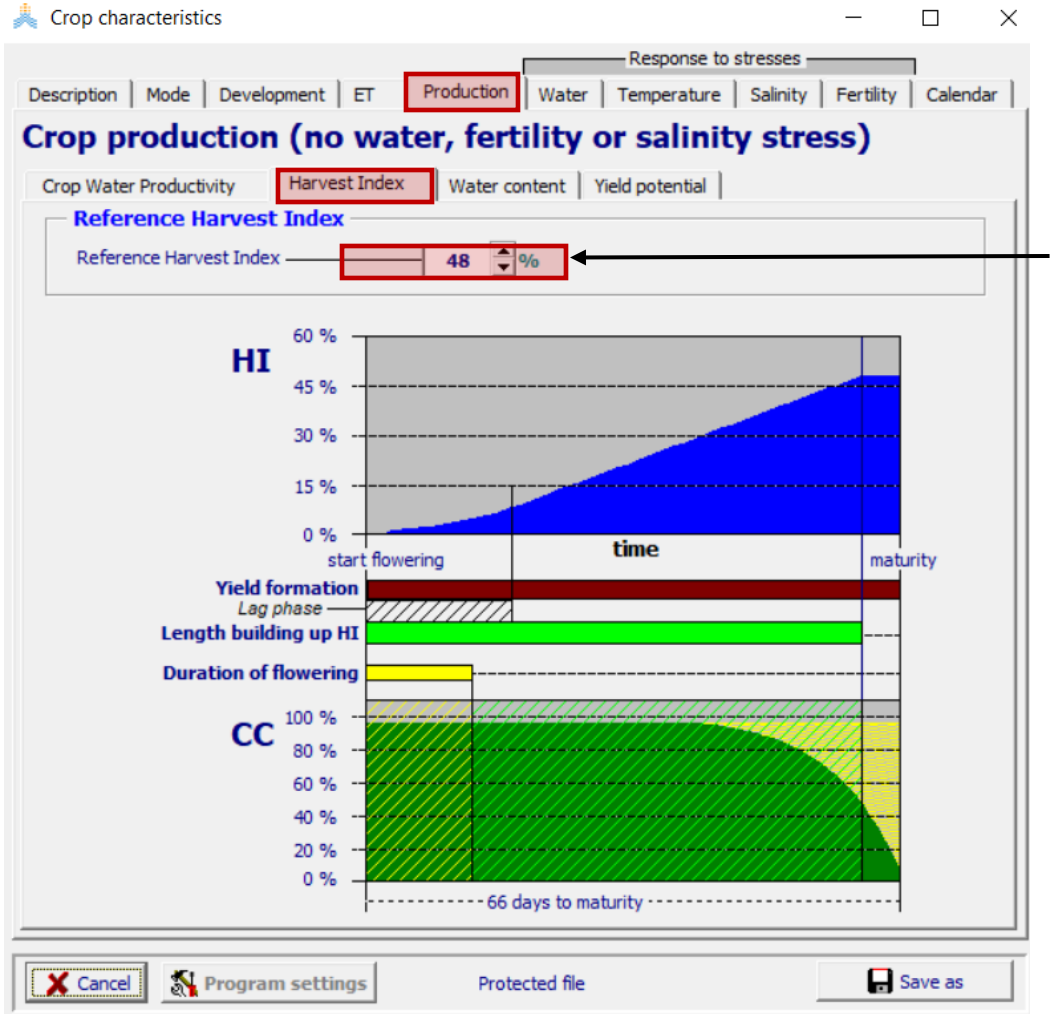
Step 2. Click on **Harvest Index** and modify the following **Reference Harvest Index** parameters:



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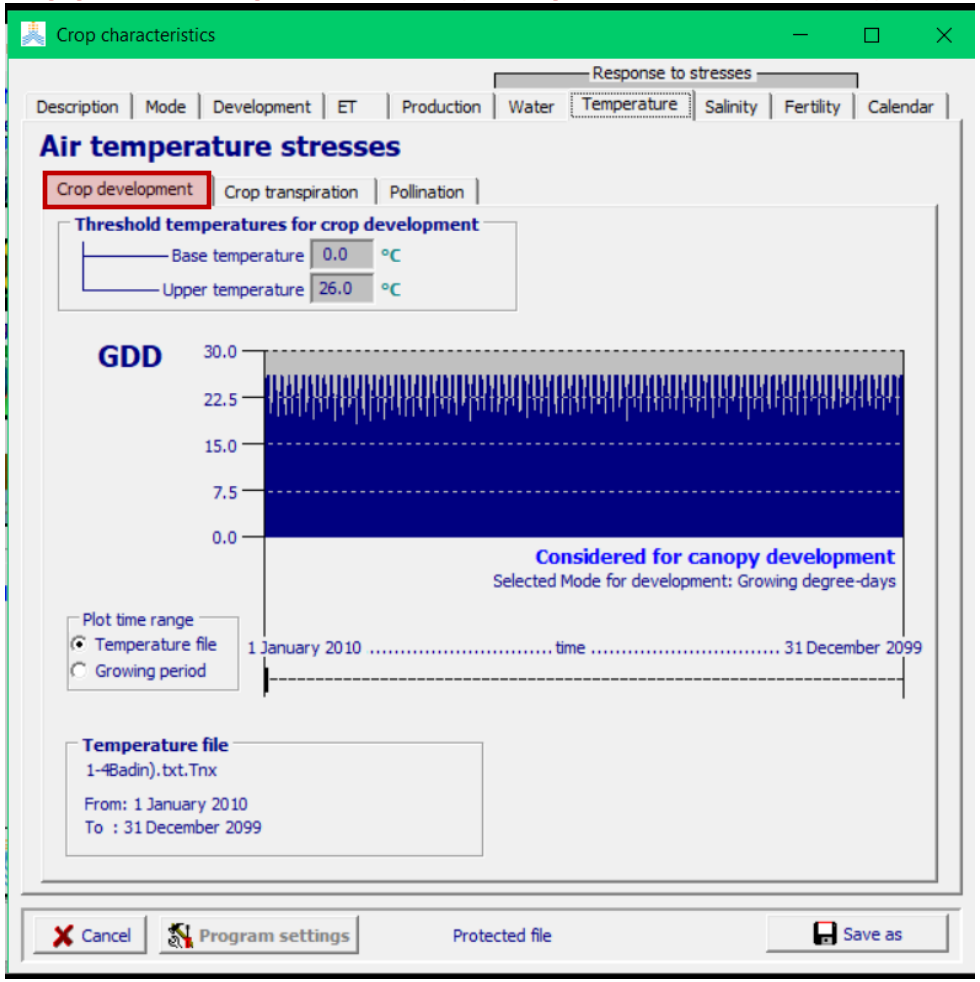
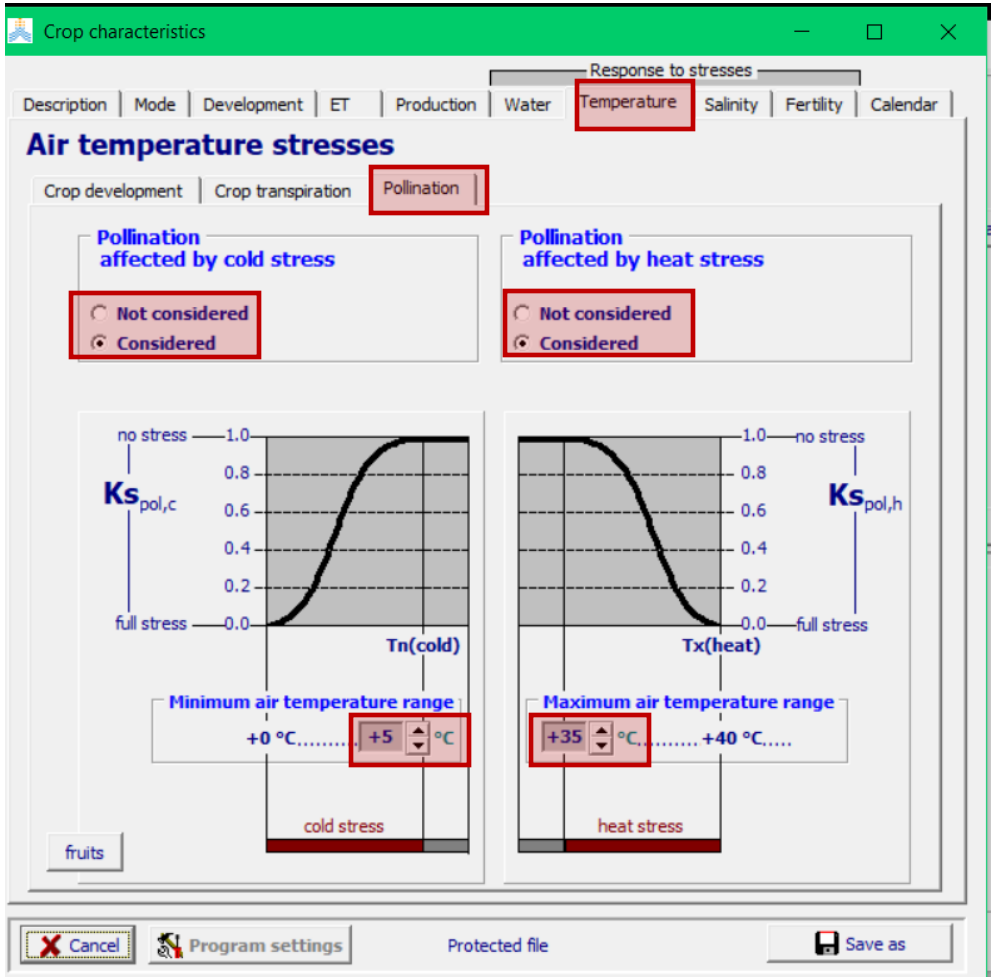
Create a crop file: air temperature stresses

Step 1. Click on **Crop Development**, in this section you can modify the **base** and **upper temperature (keep 0°C and 26°C)**

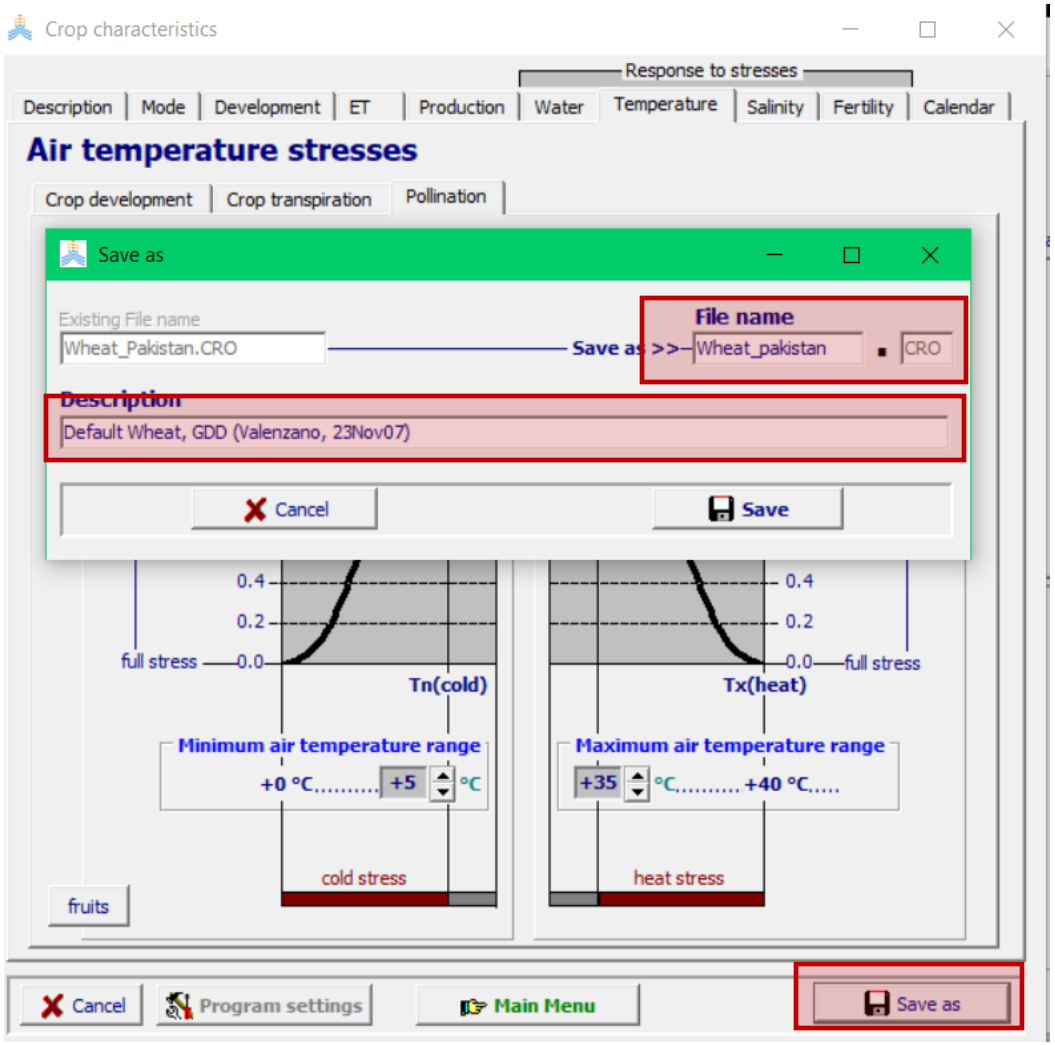


Step 2. Click on **Pollination**, select **consider** (both for cold/heat-stress) and keep **Max. air temp. Range values (+5°C and +35°C)**



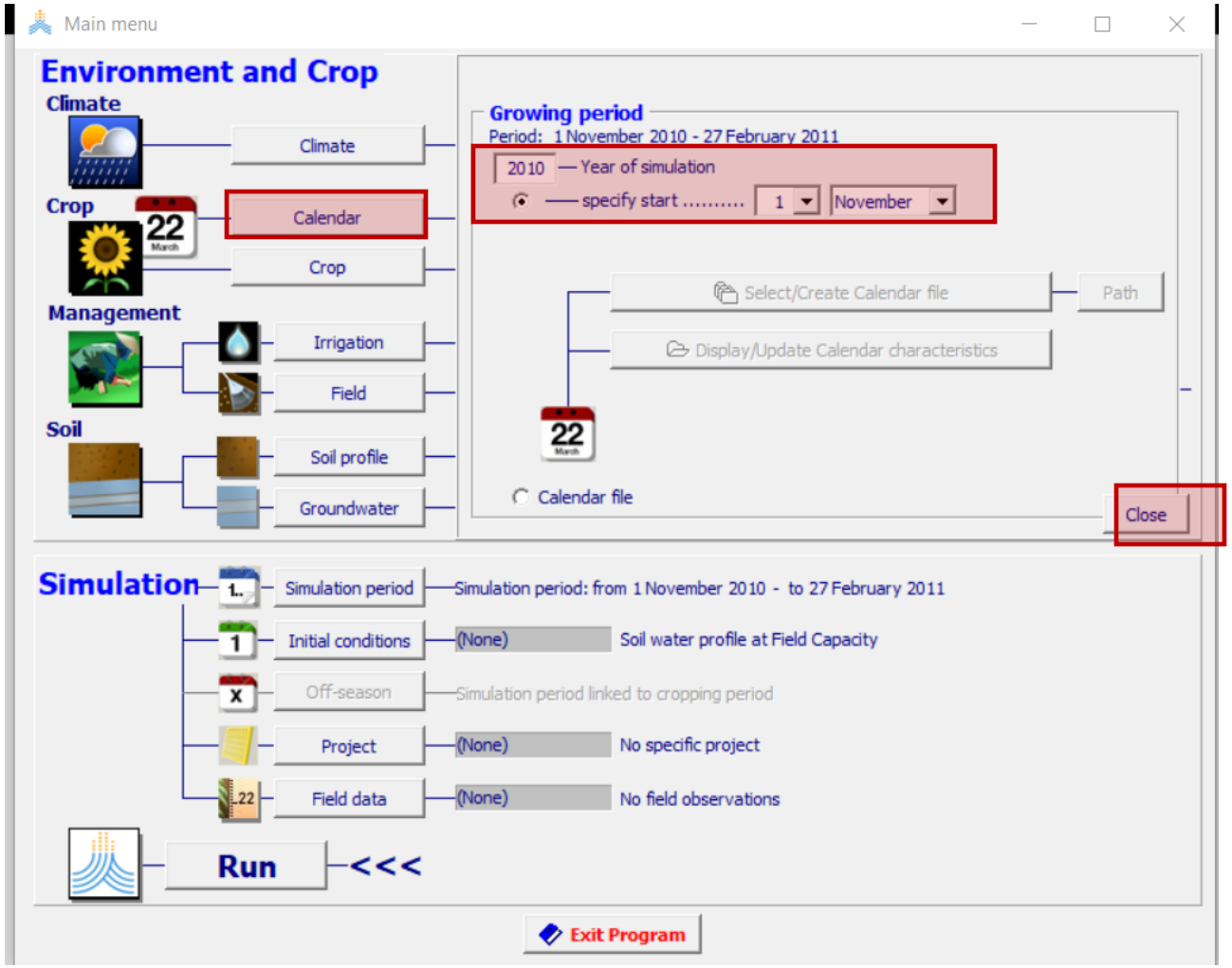
Save the crop file

Step 1. Click on **Save as** (bottom of the screen) and enter the following **File name "Wheat_Pakistan"** and in **Description "Wheat_Pakistan"**



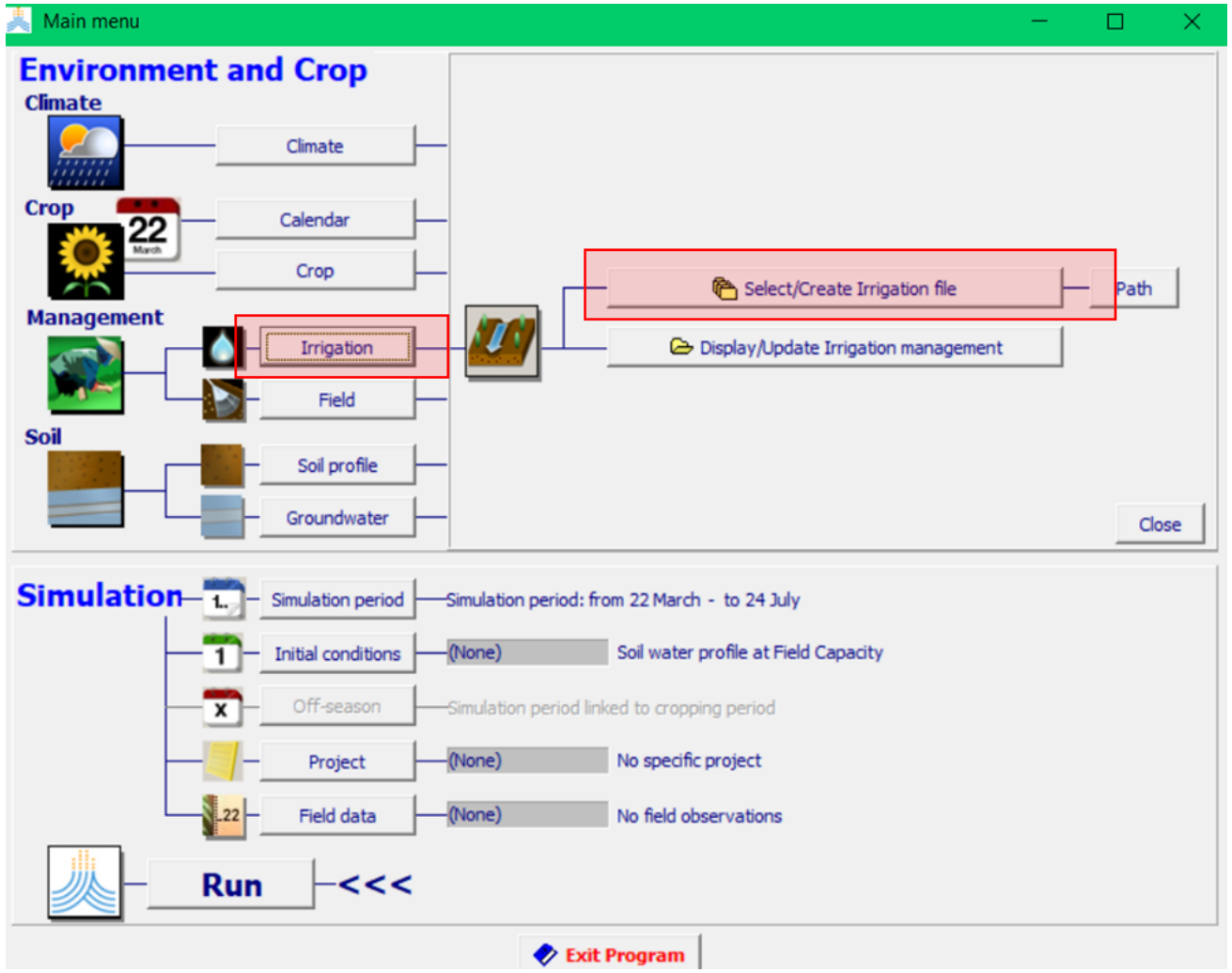
Crop Calendar: sowing date

Step 1. Click on **Calendar**, specify the sowing date "**1st of November**" and click on **Close**



Irrigation file: fixed interval

Step 1. Click on **Irrigation**
Step 2. Click on **Select/Create Irrigation file**

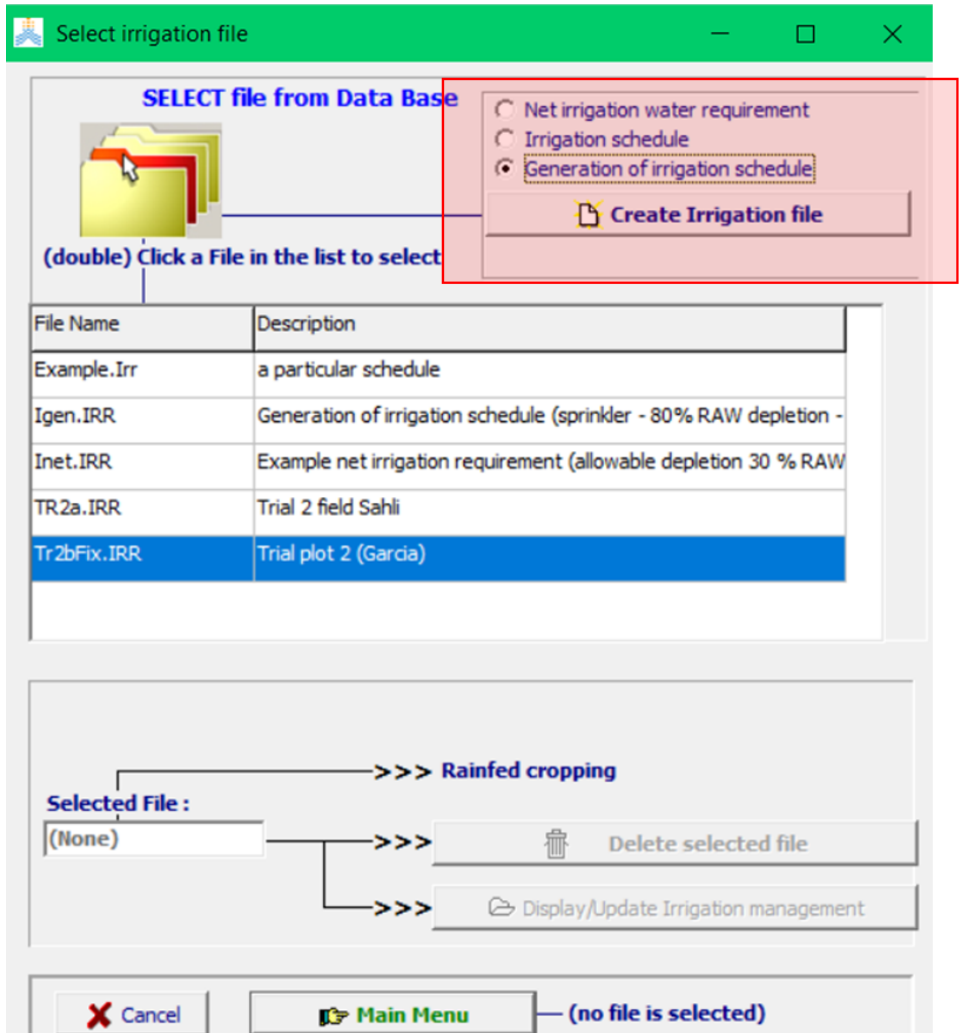


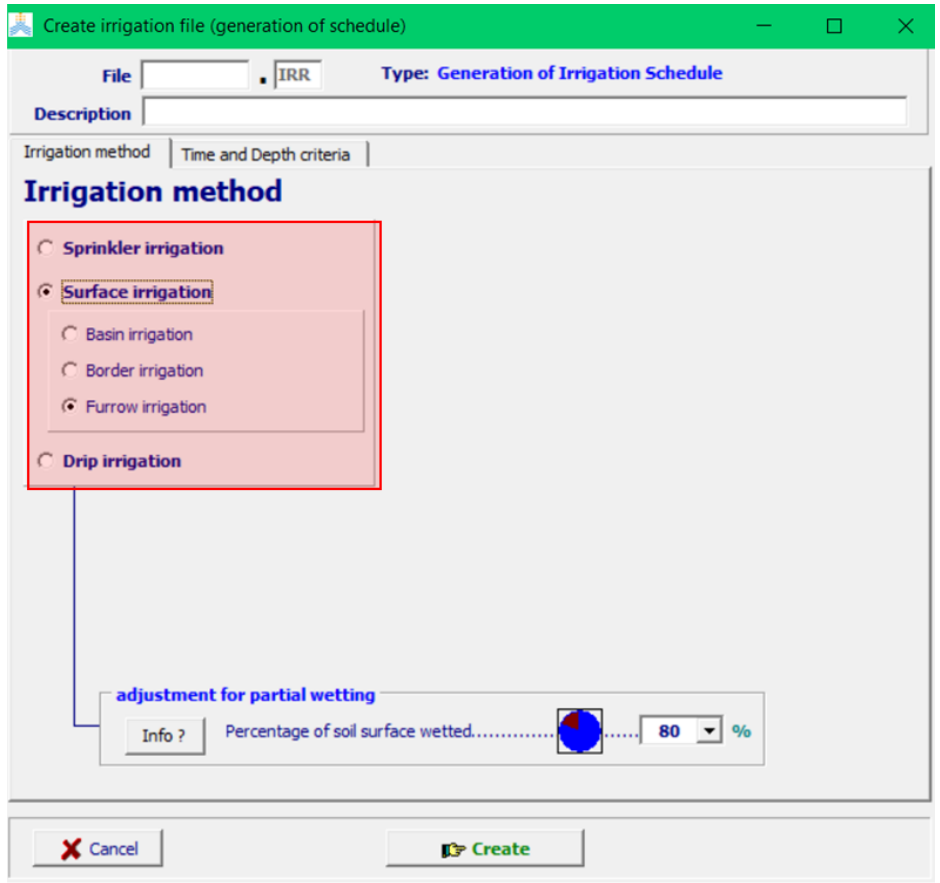
Irrigation file: fixed interval

Step 1. Click on **Generation of irrigation schedule**

Step 2. Click on **Surface irrigation**

Step 3. Click on **Furrow irrigation**





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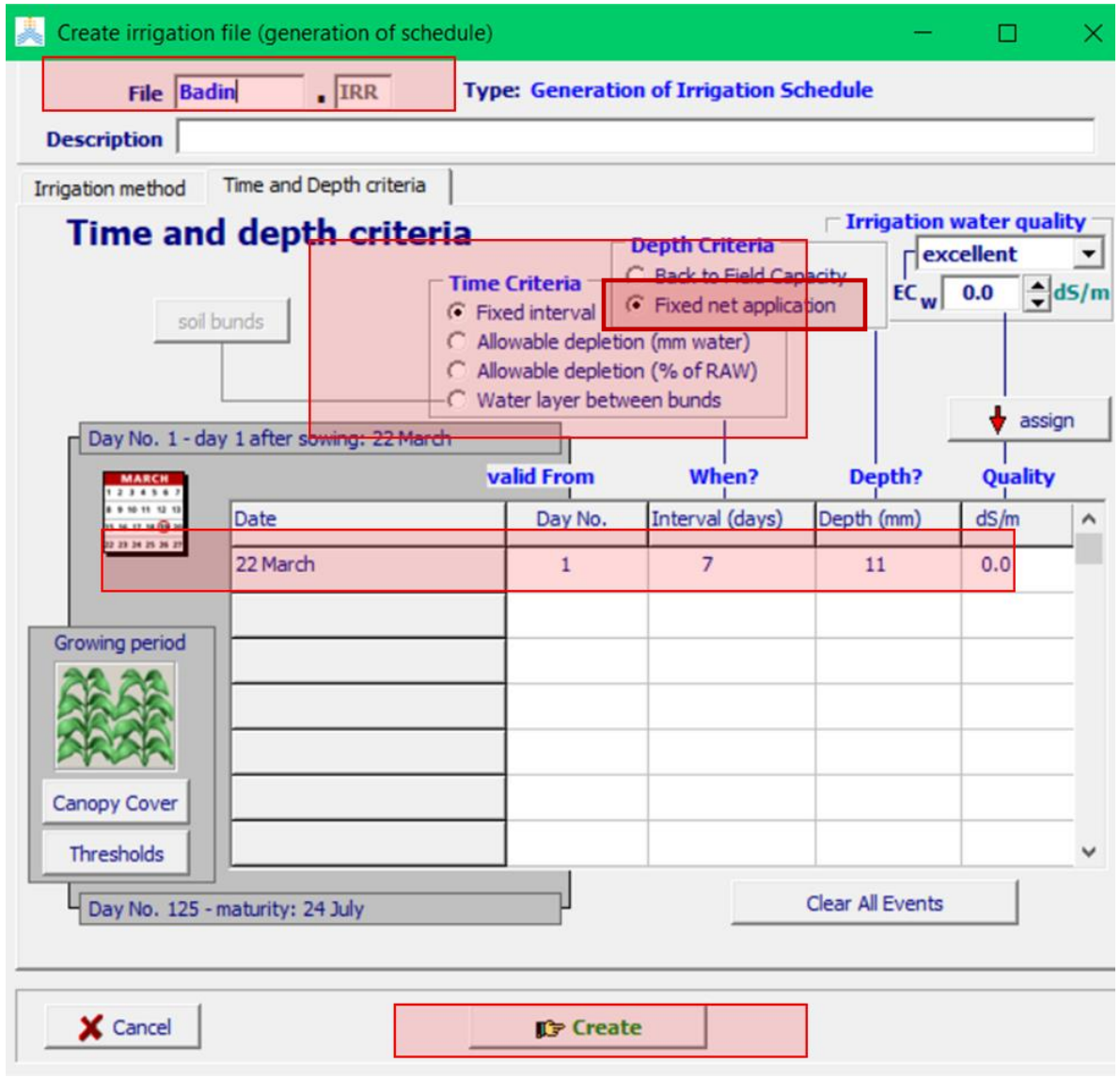
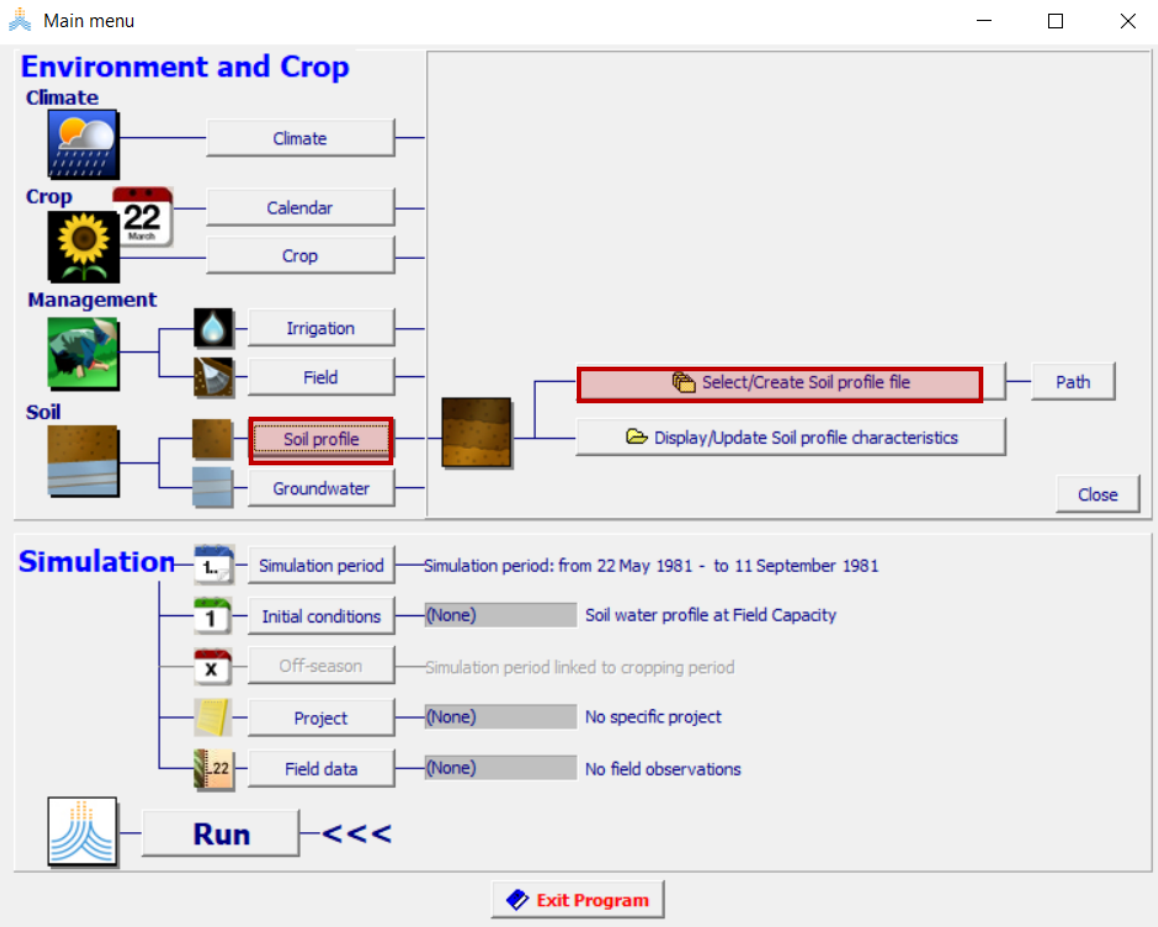
Irrigation file: fixed interval



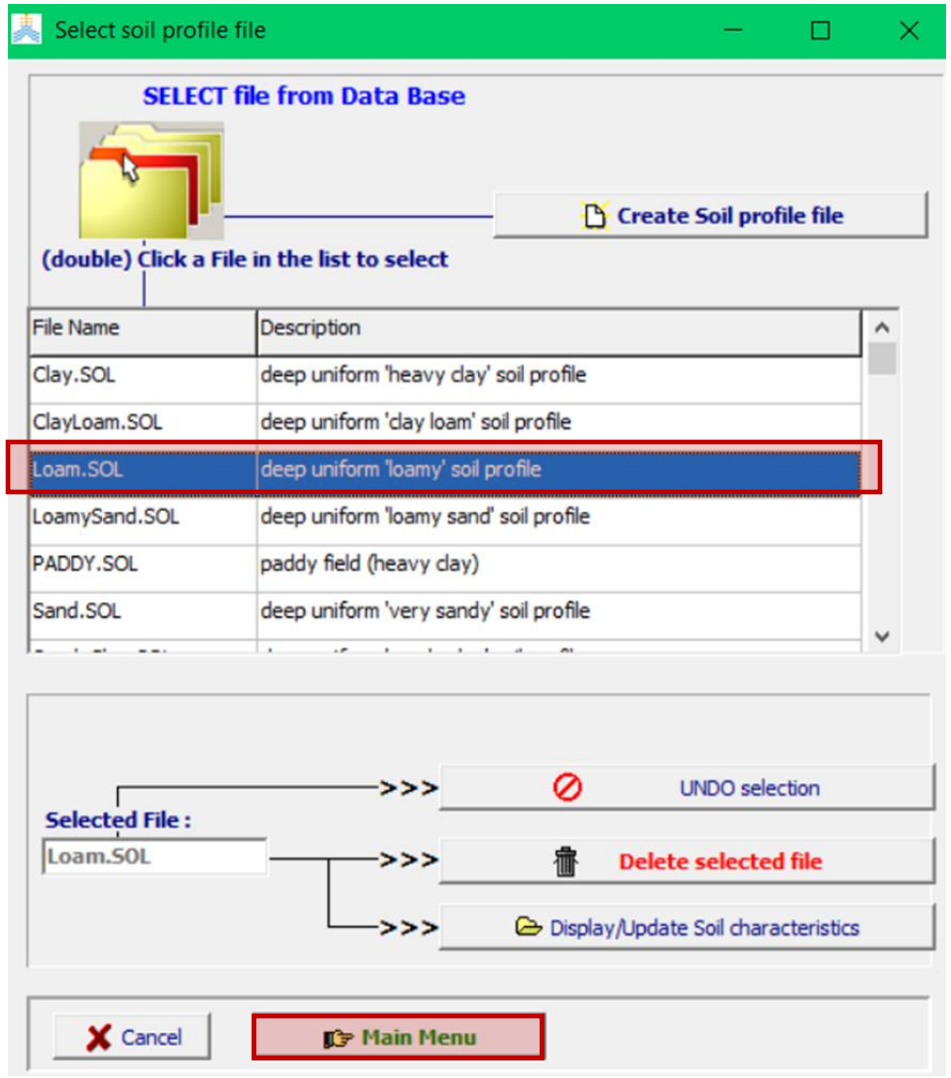
Step 1. Click on **Fixed interval**
Step 2. Click on **Fixed net application**
Step 3. Select **7** under **Interval (days)**
Step 4. Select **11** under **Dept (mm)**
Step 5. Name the file as: **"Badin"**
Step 6. Click on **Create**

Soil: upload a soil file for Badin

Step 1. Click on **Soil profile** and on **Select/Create Soil profile**



Step 2. Click on **Loam** and on **Main Menu**



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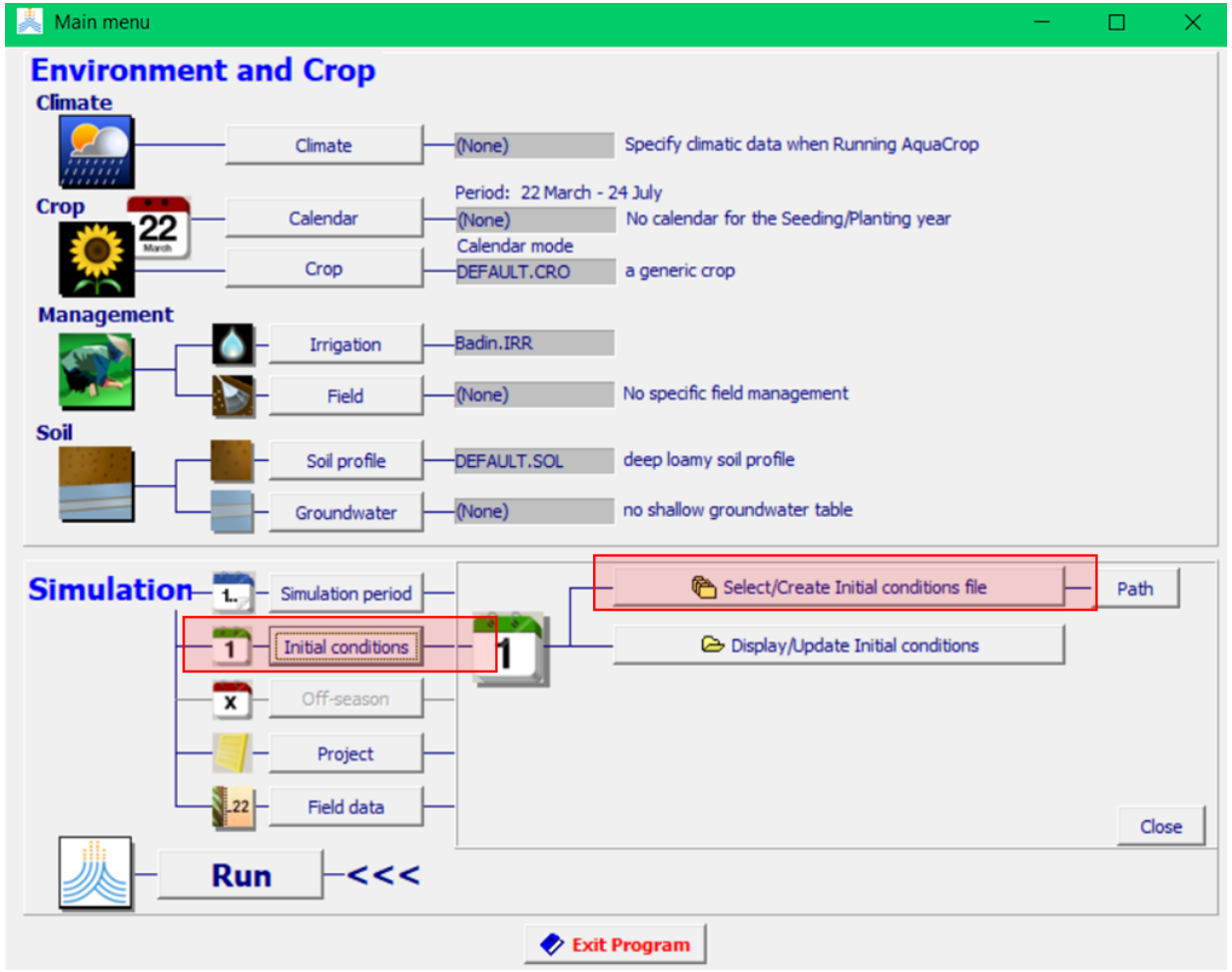
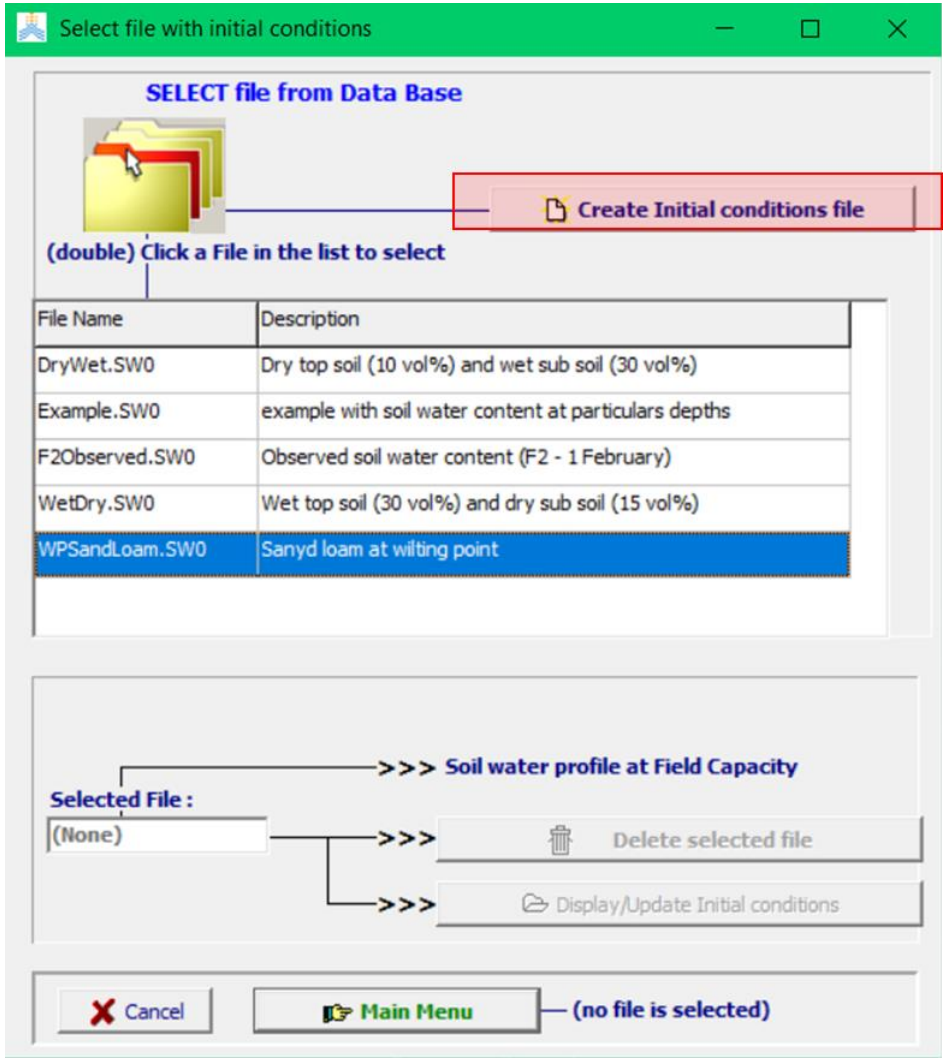
Soil water initial condition: create a SW0 file

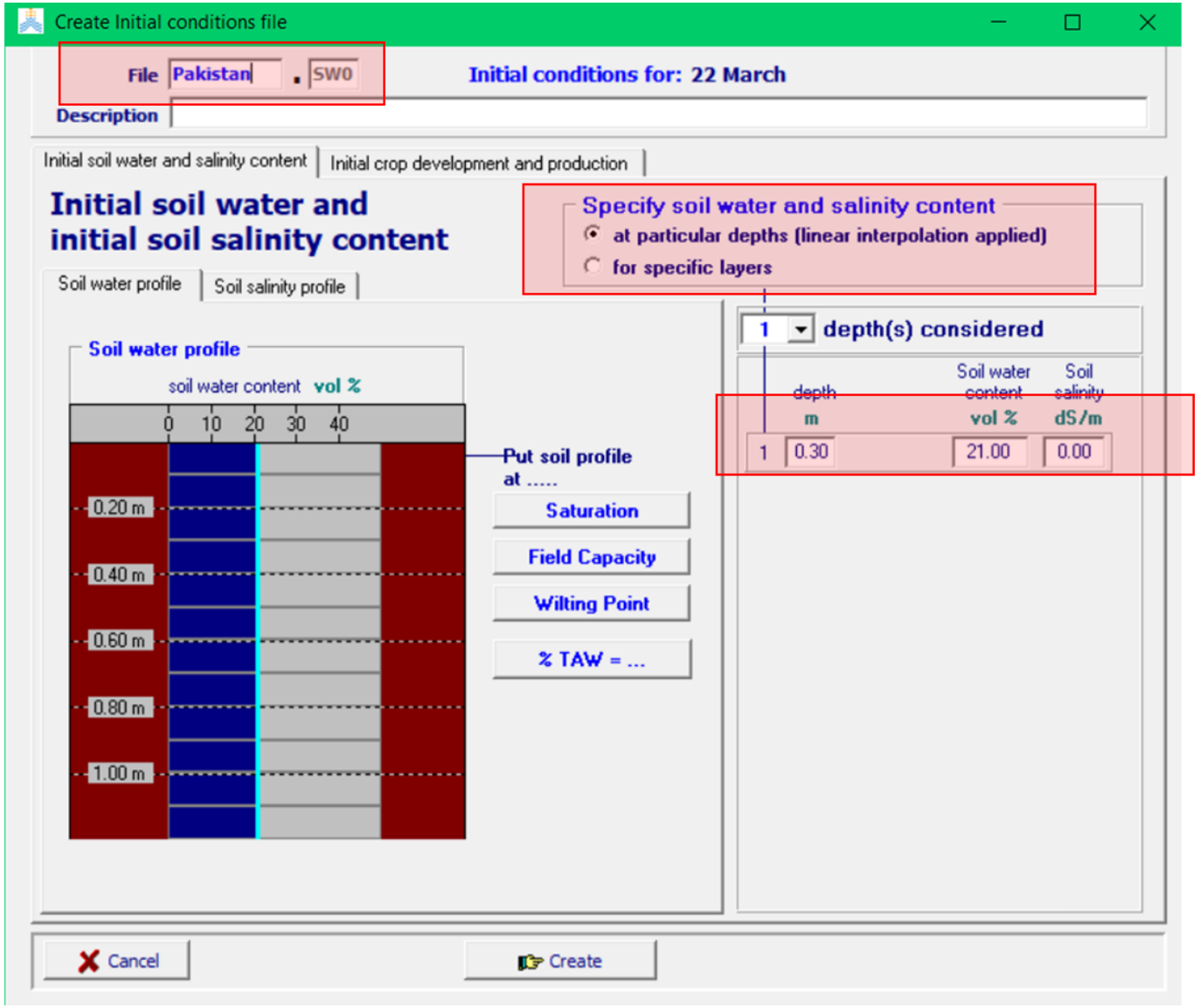
Step 1. Click on **Initial conditions** and on **Select/Create Initial condition file**



Step 2. Click on **Create Initial condition file**



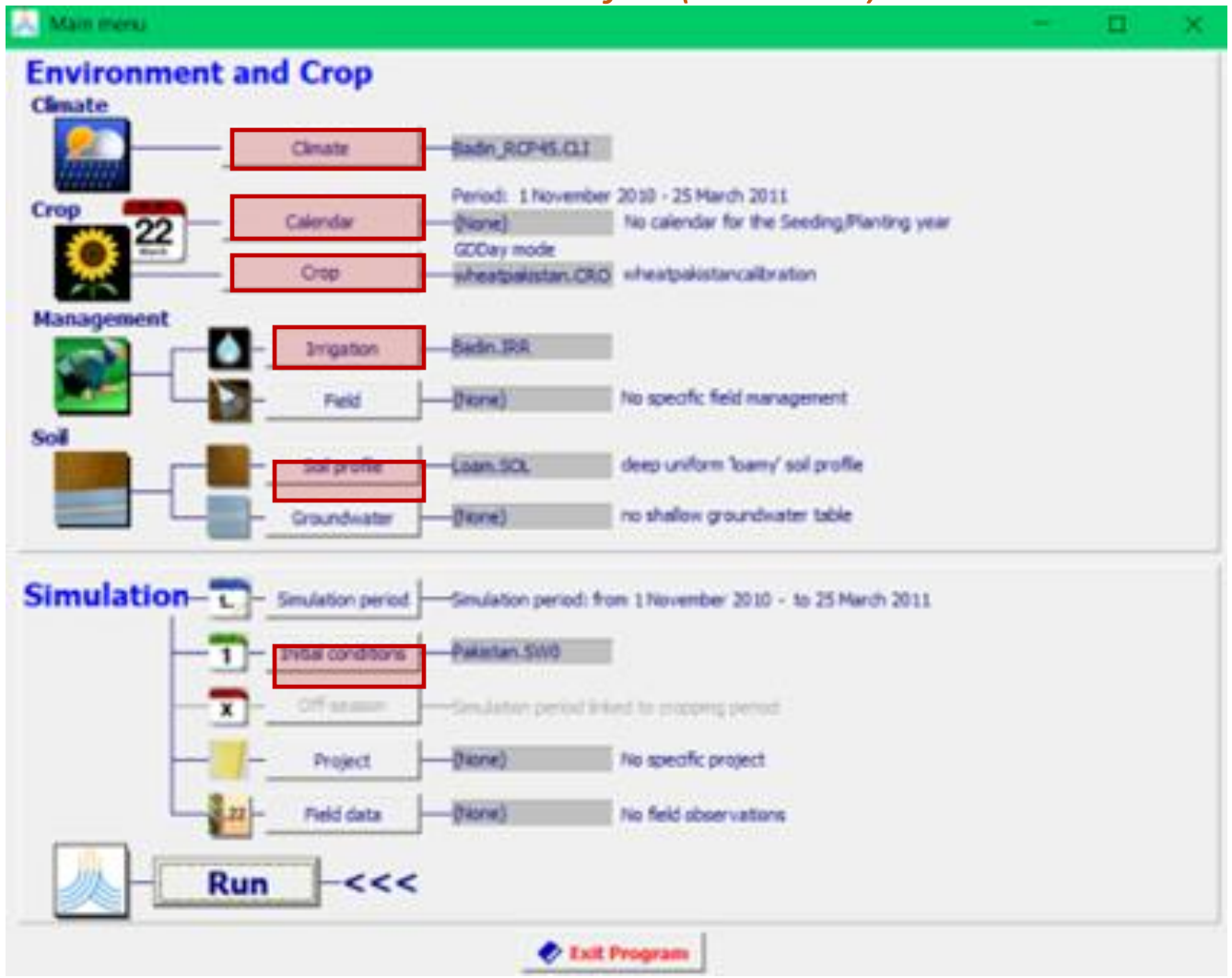
Soil water initial condition: create a SW0 file



Step 1. Click on **At particular depths**
Step 2. Specify **0.30** under "depth (m)"
Step 3. Specify **21.00** under "Soil water content (vol%)"
Step 4. Name it "**Pakistan**"

Status: progress made so far

We now have a climatic file (Badin_RCP45), a calendar date (1st November), a crop file (Wheat_Pakistan), an irrigation file (Badin), a soil profile file (Loam) and a soil water initial condition file (Pakistan)!



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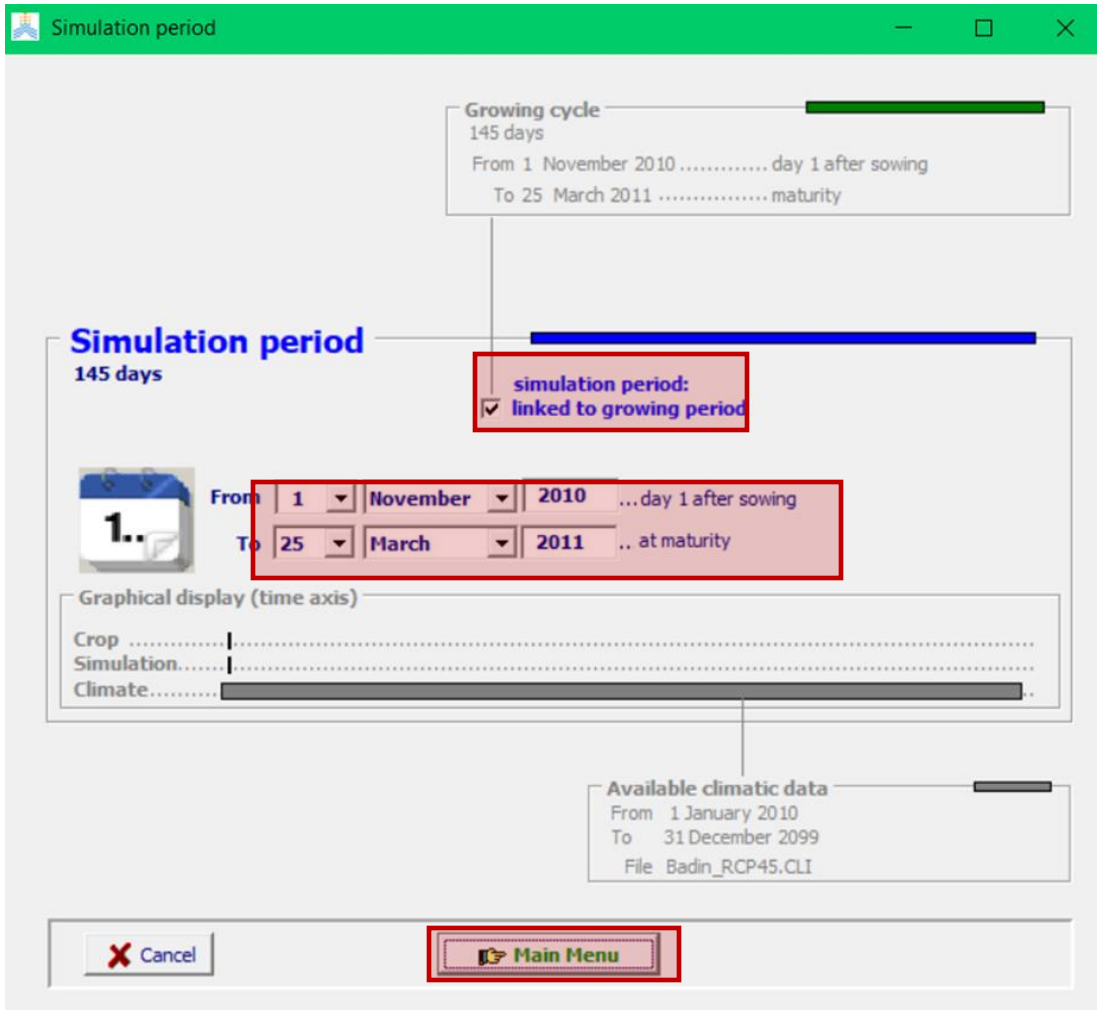
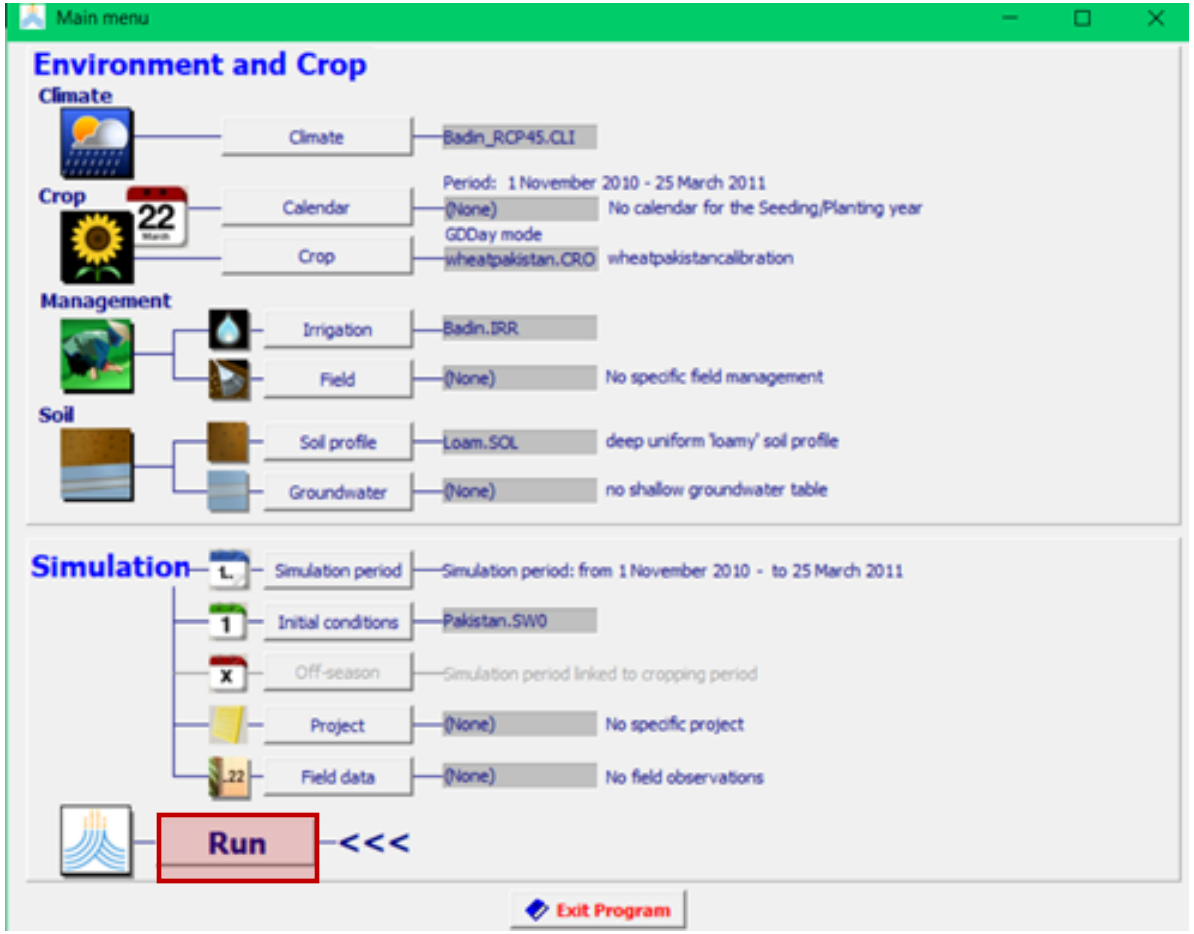
Select a simulation period

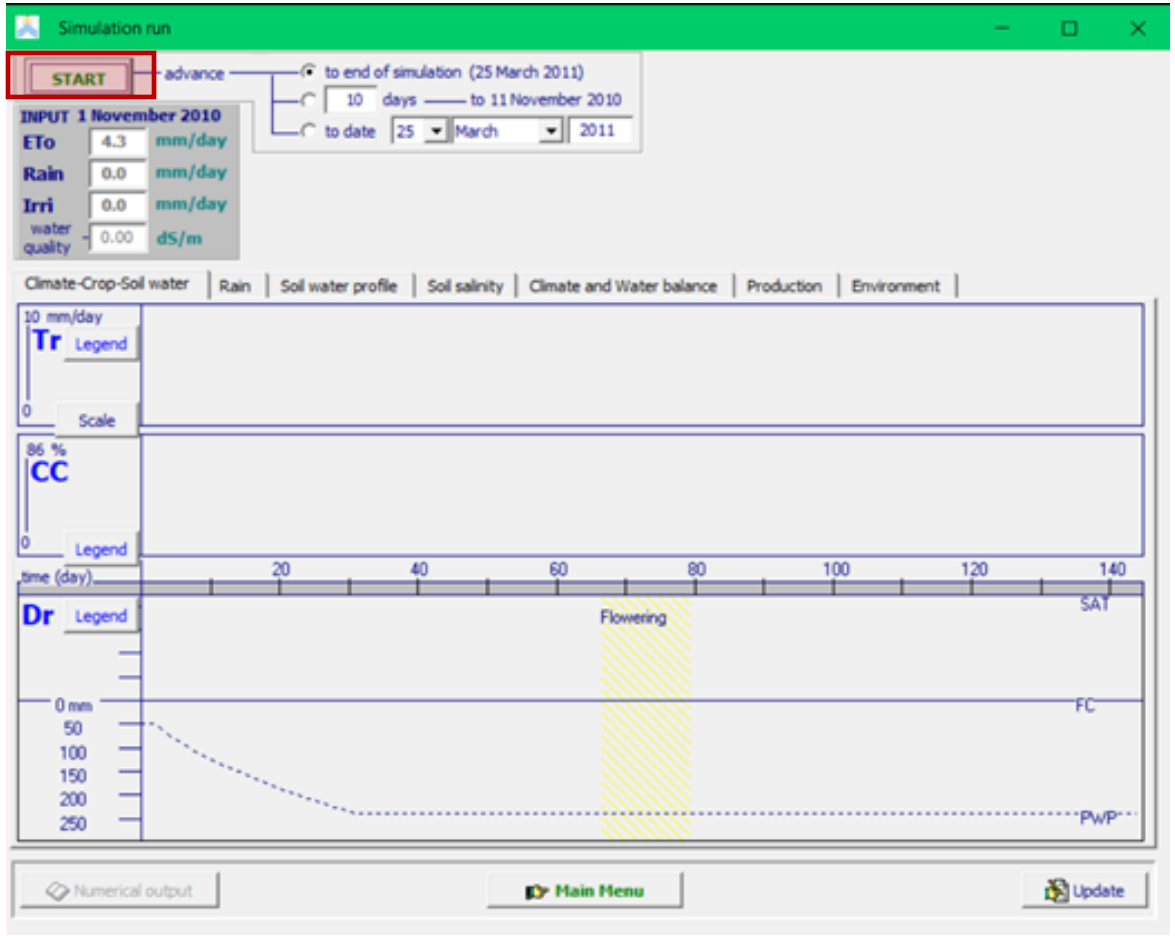
Step 1. Click on **Simulation period** and double check that the simulation period is **linked to the growing period**, then click on **Main Menu**



Run the Simulations

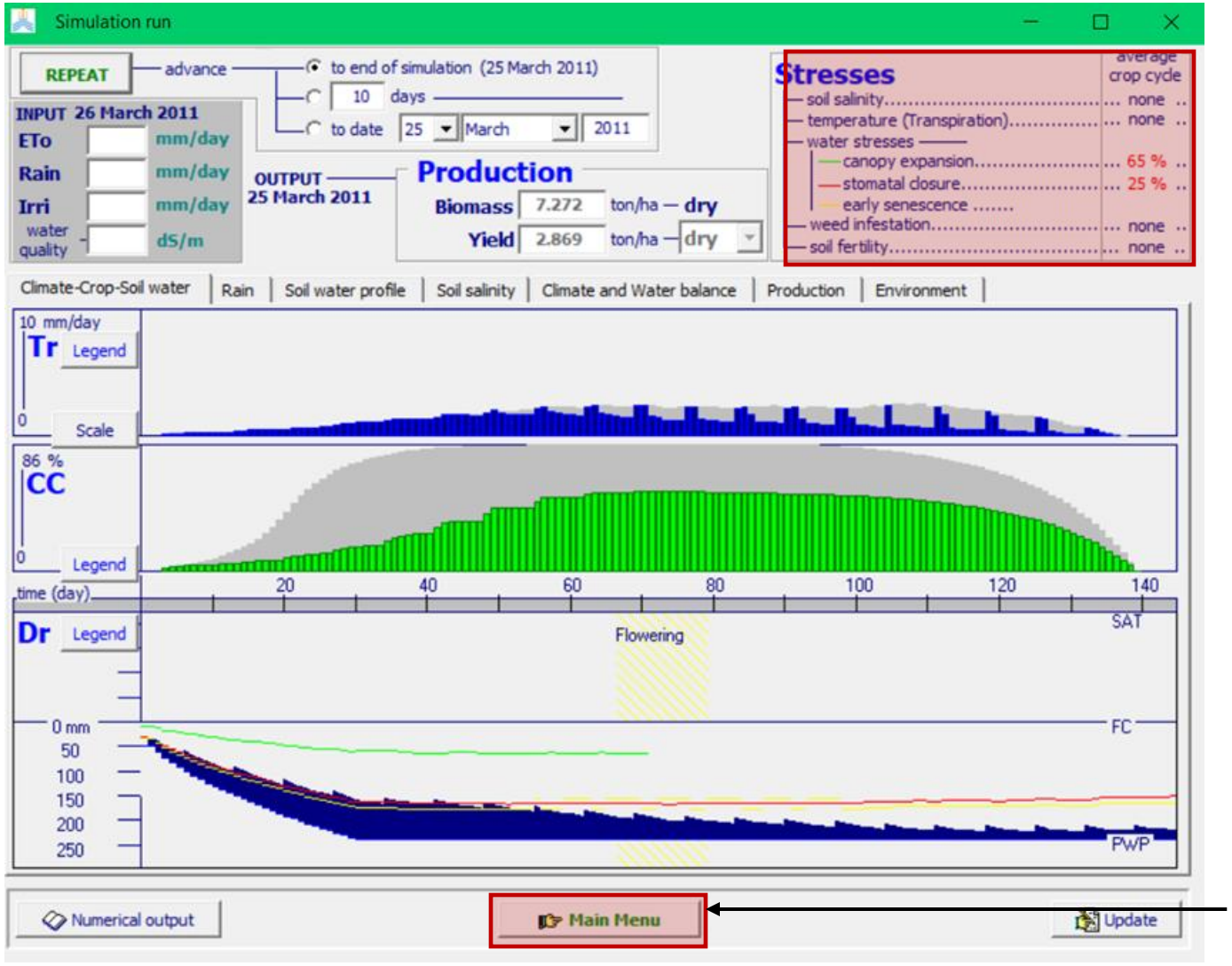
Step 1. Click on **Run** and then click on **START**





Results visualization

In this section, we will look at the yield results emerging for Badin in 2010/2011, particularly water and temperature stresses



Step 1. Click on **Main Menu** to save the results

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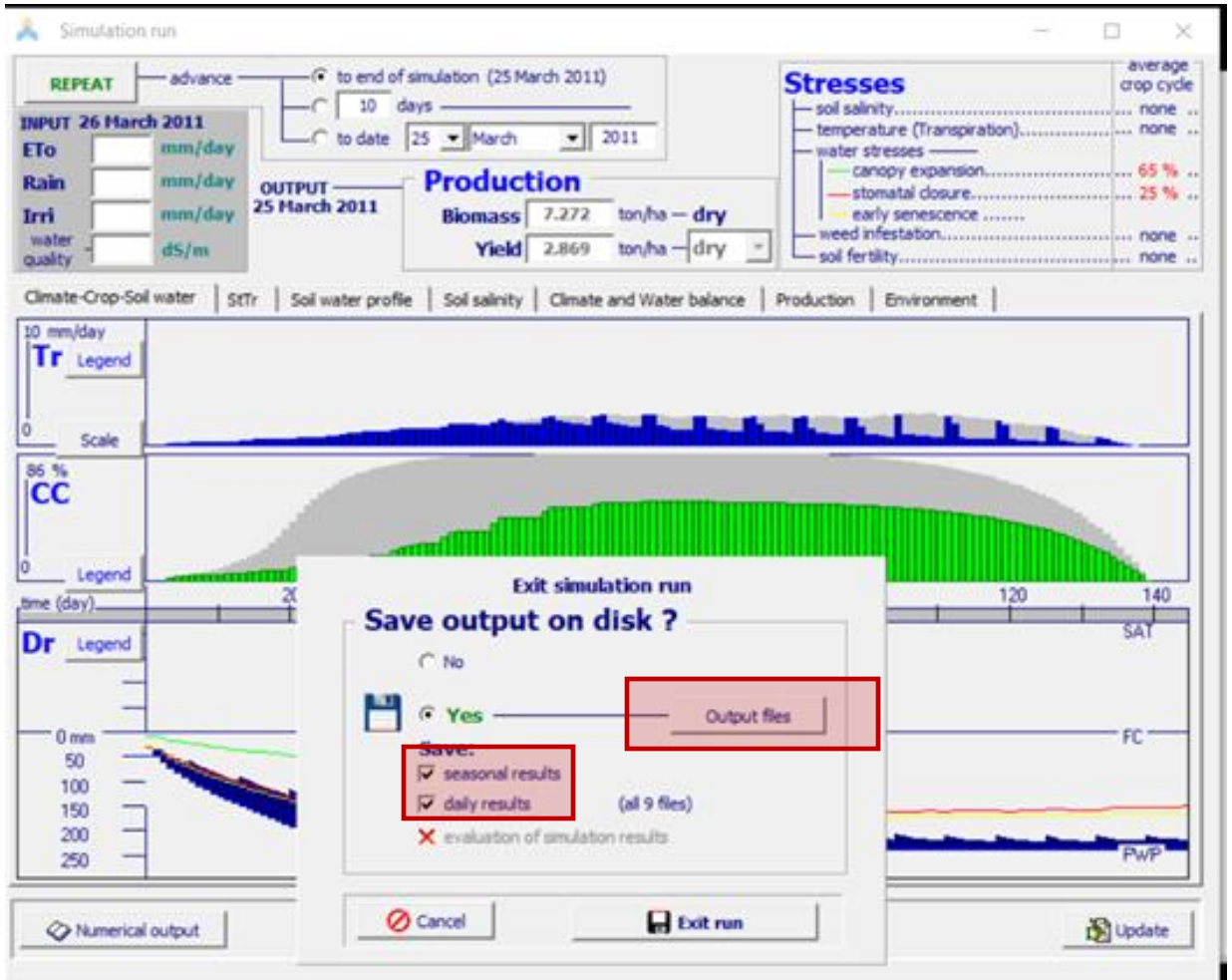
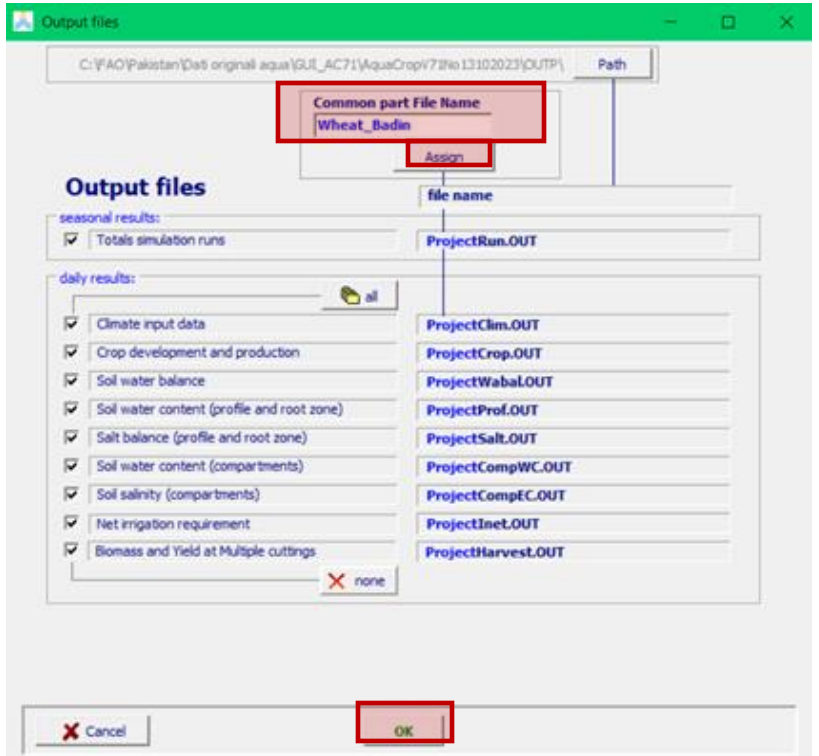
Save the simulation results

Step 1. Click on **Yes** (make sure that seasonal and daily results are ticked).

Step 2. Click on **Output files**



Step 3. Under **Common part File Name** save the file as **"Wheat_Badin"** (make sure that all the output files are ticked) and then click on **Assing** and **OK**



Step 4. Click on **Yes**

Thank you!

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