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FAO AquaCrop exercise

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Objective

Objective: run AquaCrop to see the effect of future climate projections on maize yield and the effect of irrigation under two emission scenarios (RCPs), in Cahul.

- GCM: MOHC
- RCPs: 2.6 and 8.5
- Management: Rainfed - Irrigated
- Crop: Maize
- Locations: Cahul

Project File (.PRM) structure

Experimental design

Locations	Cahul
GCM	MOHC
RCPs	2.6 8.5
Management	Rainfed Irrigated
Crop	Maize

4 Project files

Time series: 119 years -> 1/01/1981 – 31/12/2099

Maize_Cahul_10May_Rainfed_26_MOHC
Maize_Cahul_10May_Irrigated_26_MOHC
Maize_Cahul_10May_Rainfed_85_MOHC
Maize_Cahul_10May_Irrigated_85_MOHC

Instruction

- The link to all the **SLIDES** presented in this presentation and the **DATA** can be found at: https://github.com/Risk-Team/Moldova-workshop

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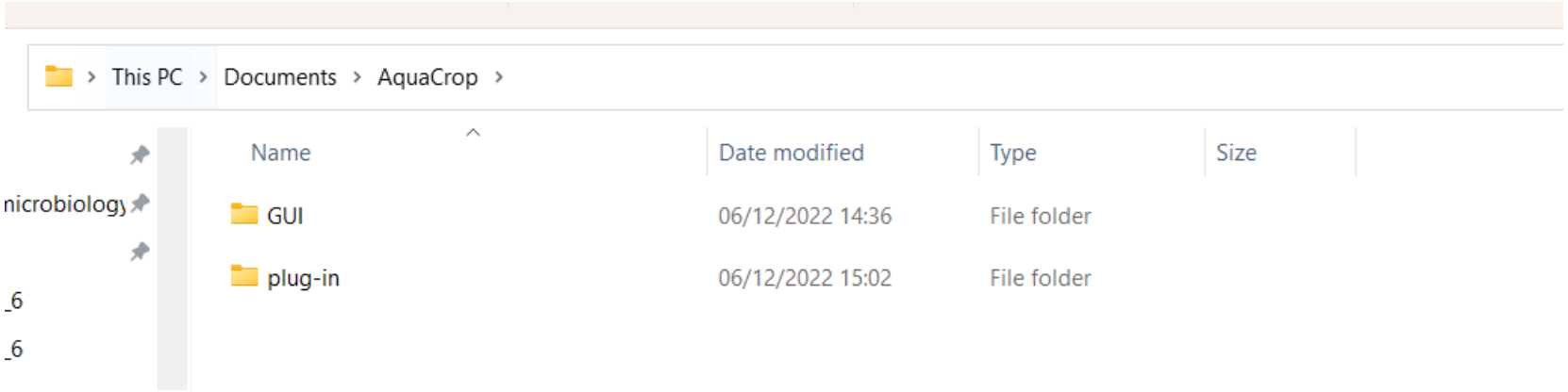
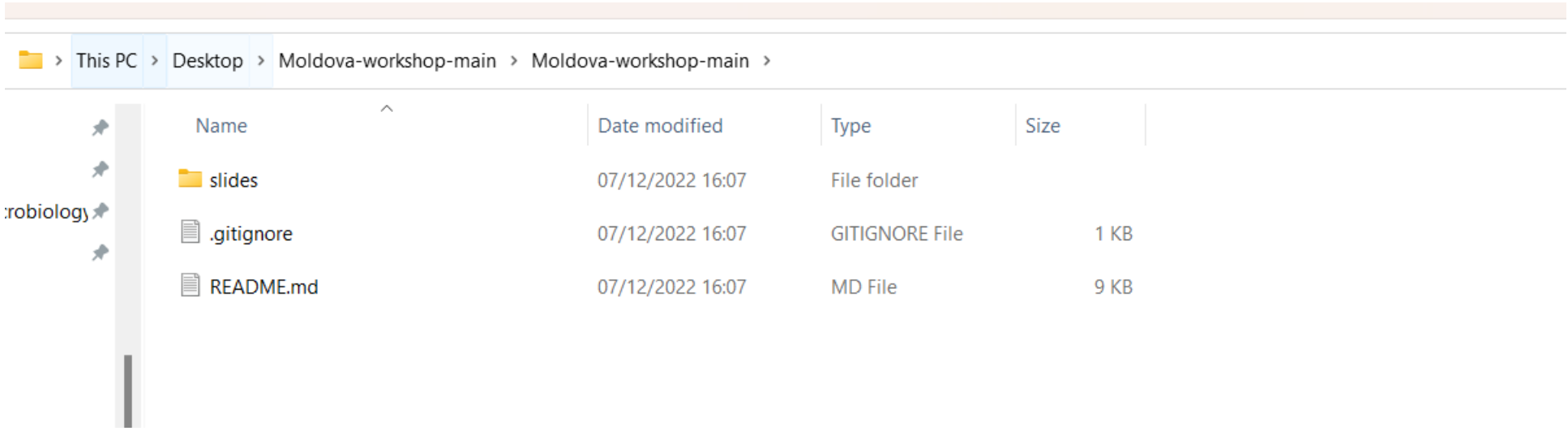
In case you do not have AquaCrop installed

- Install AquaCrop software and AquaCrop Plugin in the documents folder

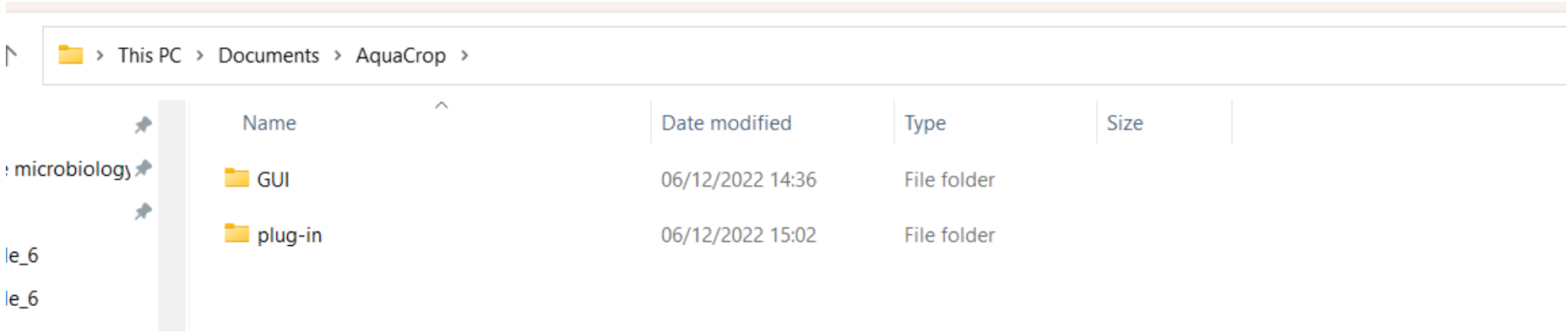


Folders location

- Where your data folder should be



- Where your AquaCrop installations should be



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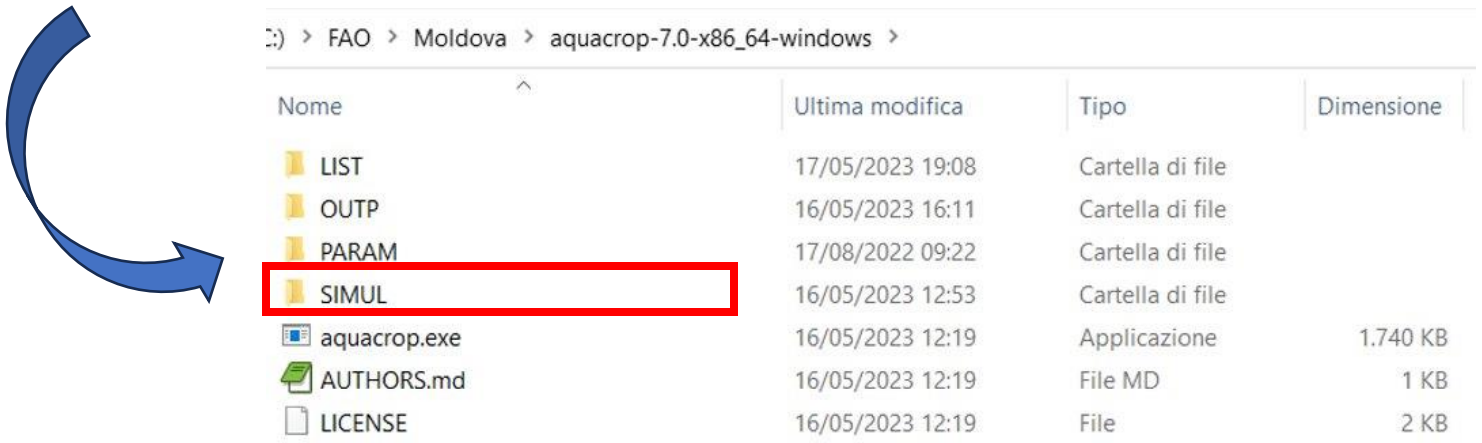
In case you do not have AquaCrop installed

- *To run the plugin the text file named "DailyResults.SIM" is needed to be in the “SIMUL” folder of the plugin. Download and paste this file .



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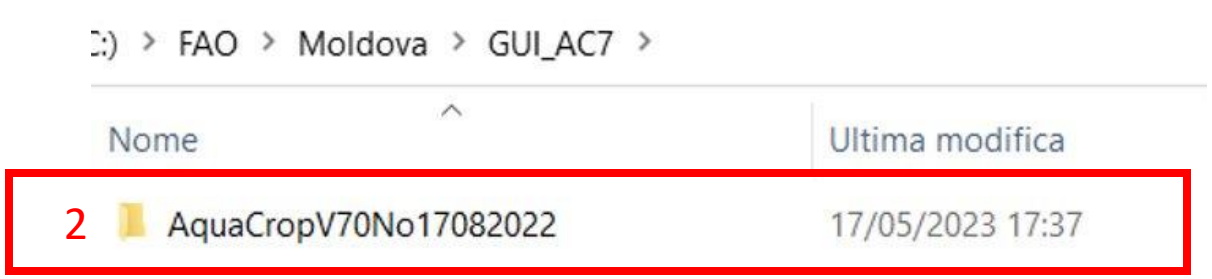
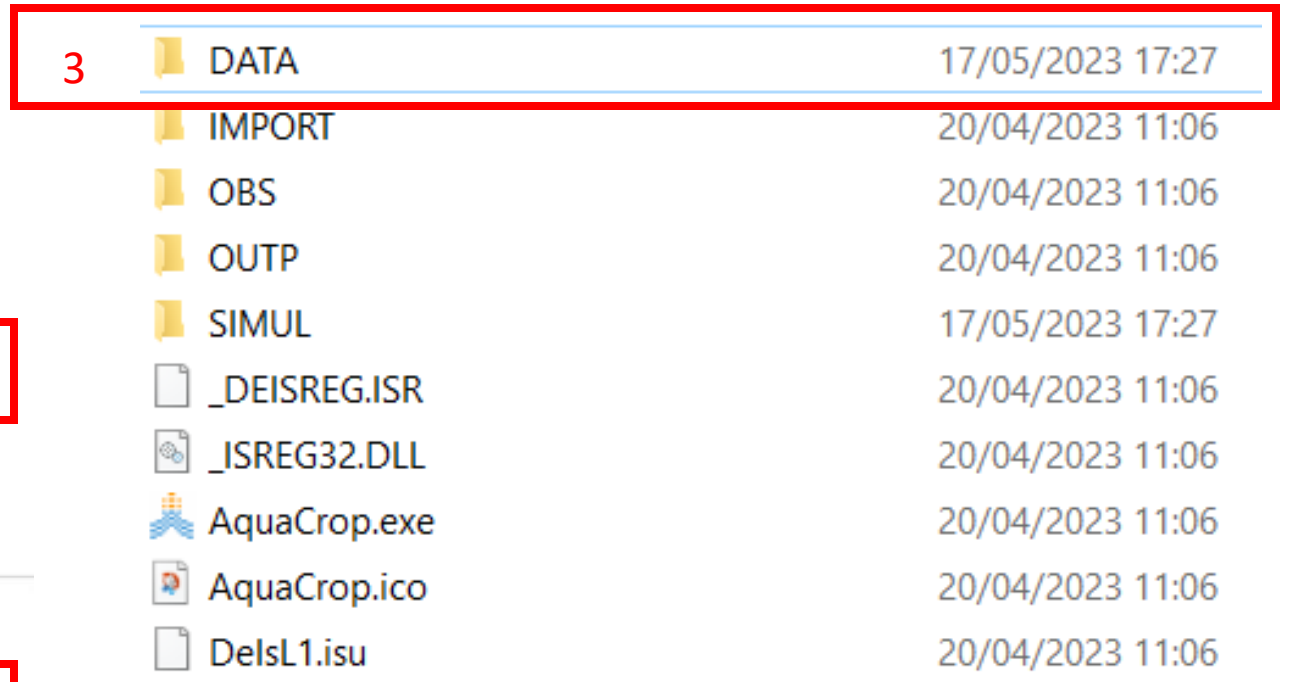
Upload of the files

Go to the GUI downloaded folder and **remove <u>all the content</u>** of your personal "DATA" folder.

Follow the shown path:





In case you would like to repristinate the AquaCrop default data you can find it in the "<u>Data with default AquaCrop files</u>" folder.

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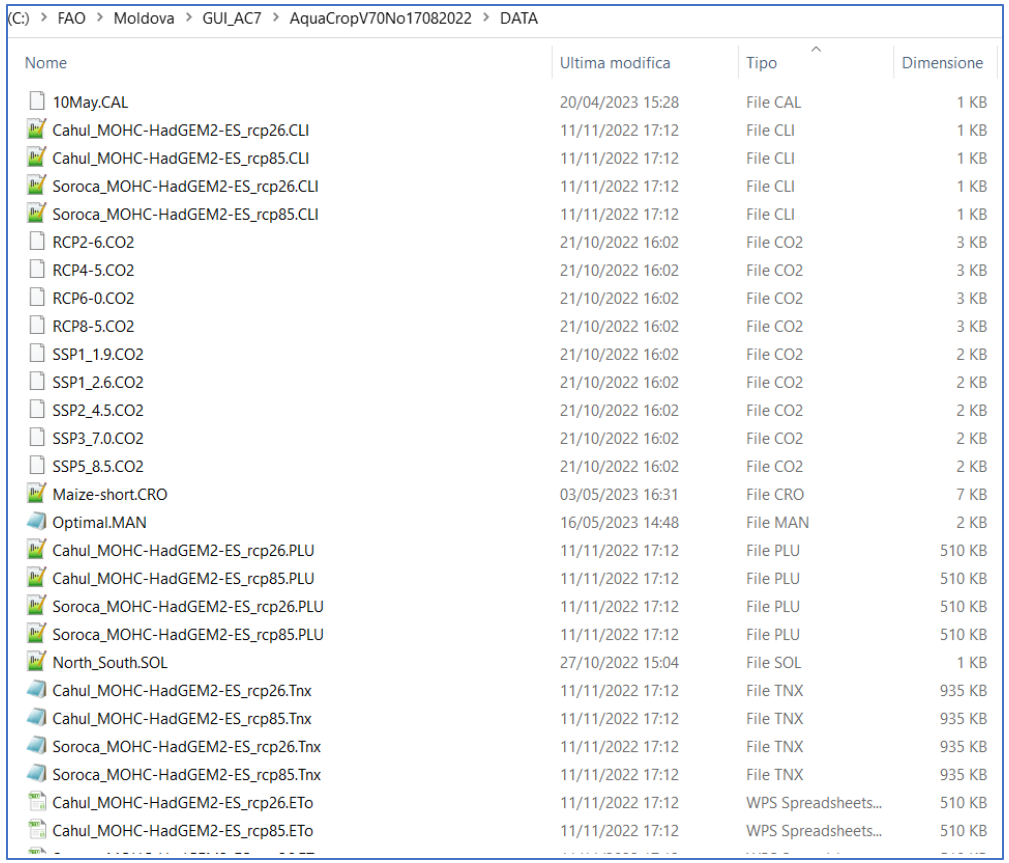
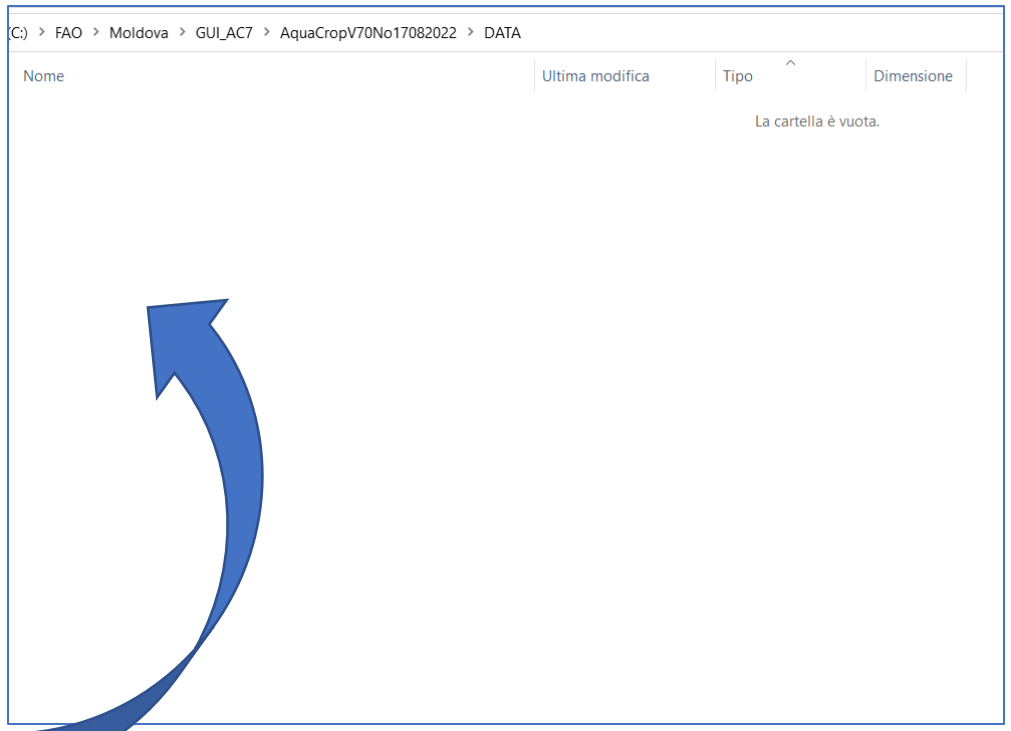
Upload of the files

Copy and paste the DATA folder content to your personal **DATA folder**.

Here **you can find the DATA** folder content



Personal DATA folder



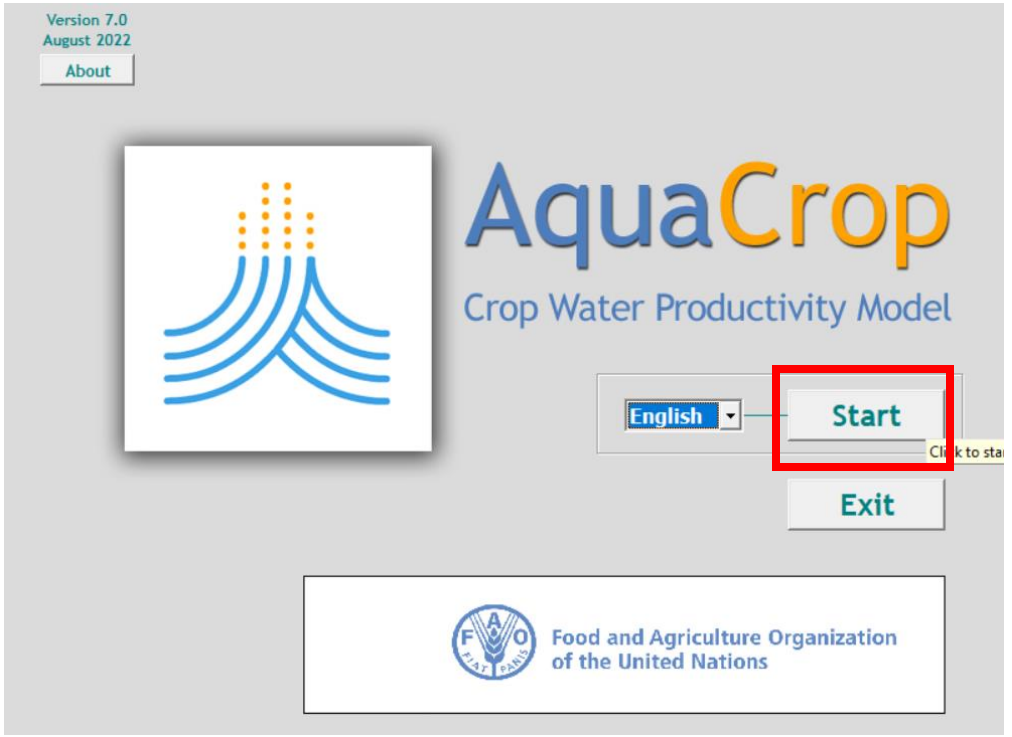
CTRL + C - CTRL + V

Open AquaCrop

1. Open AquaCrop software (double click on “AquaCrop.exe”)

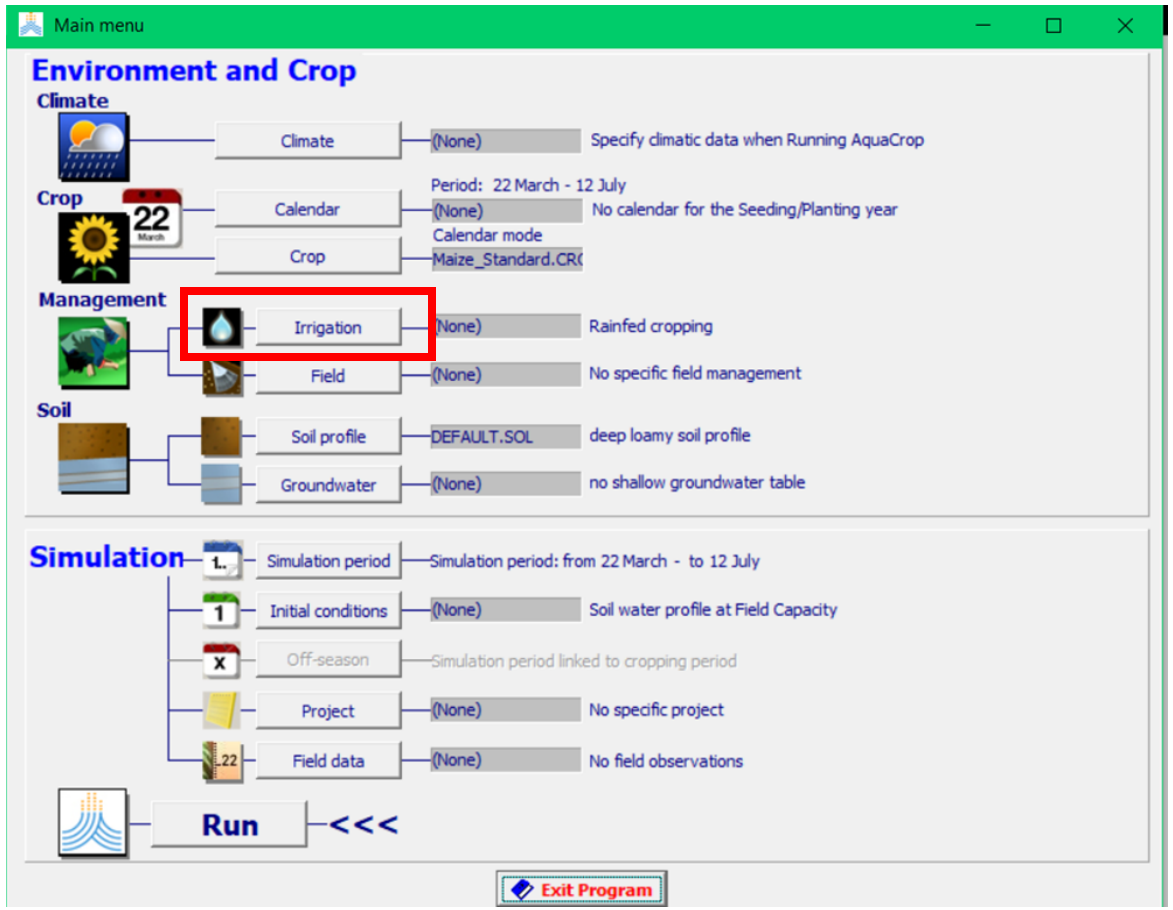
DATA	17/05/2023 17:27
IMPORT	20/04/2023 11:06
OBS	20/04/2023 11:06
OUTP	20/04/2023 11:06
SIMUL	17/05/2023 17:27
_DEISREG.ISR	20/04/2023 11:06
ISREG32.DLL	20/04/2023 11:06
AquaCrop.exe	20/04/2023 11:06
AquaCrop.ico	20/04/2023 11:06
DelsL1.isu	20/04/2023 11:06

2. Select language and press Start

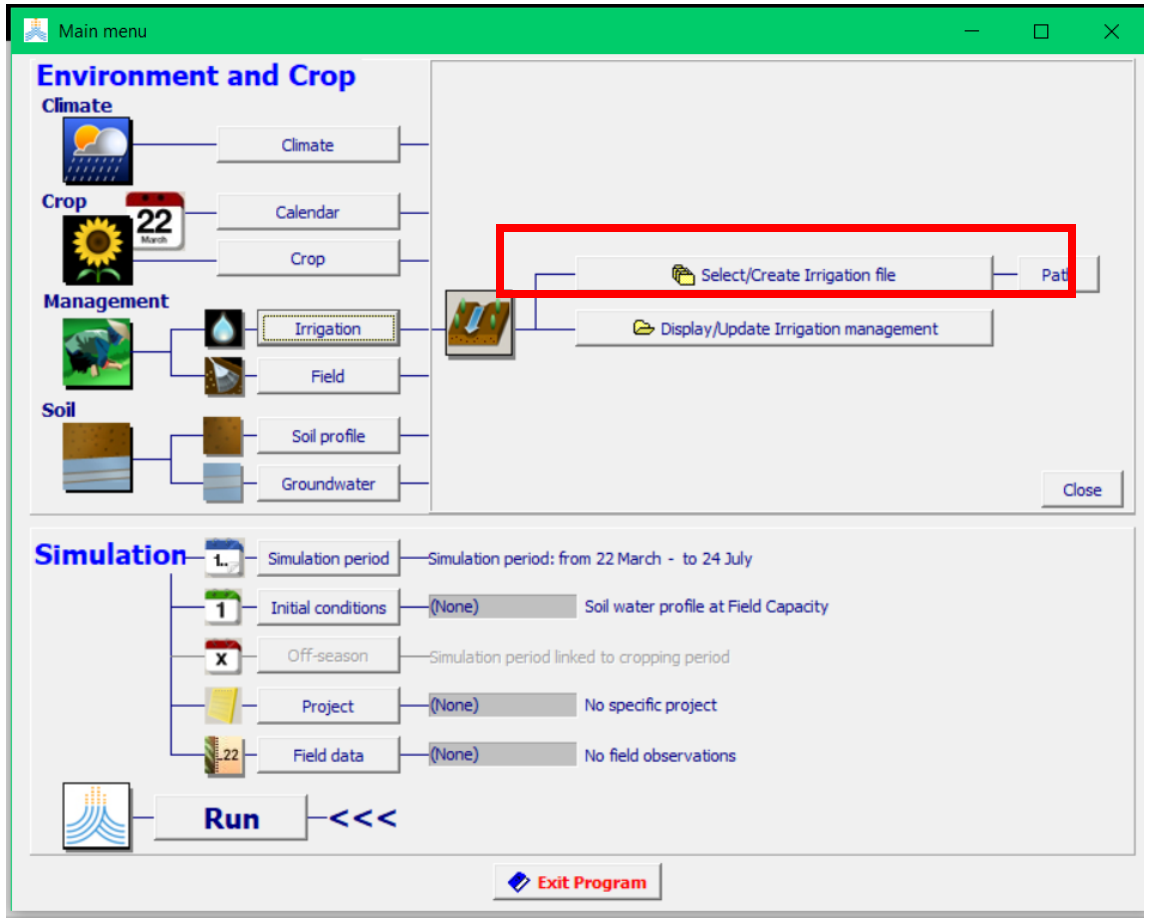


Creation of the irrigation file

Go to **Irrigation** module

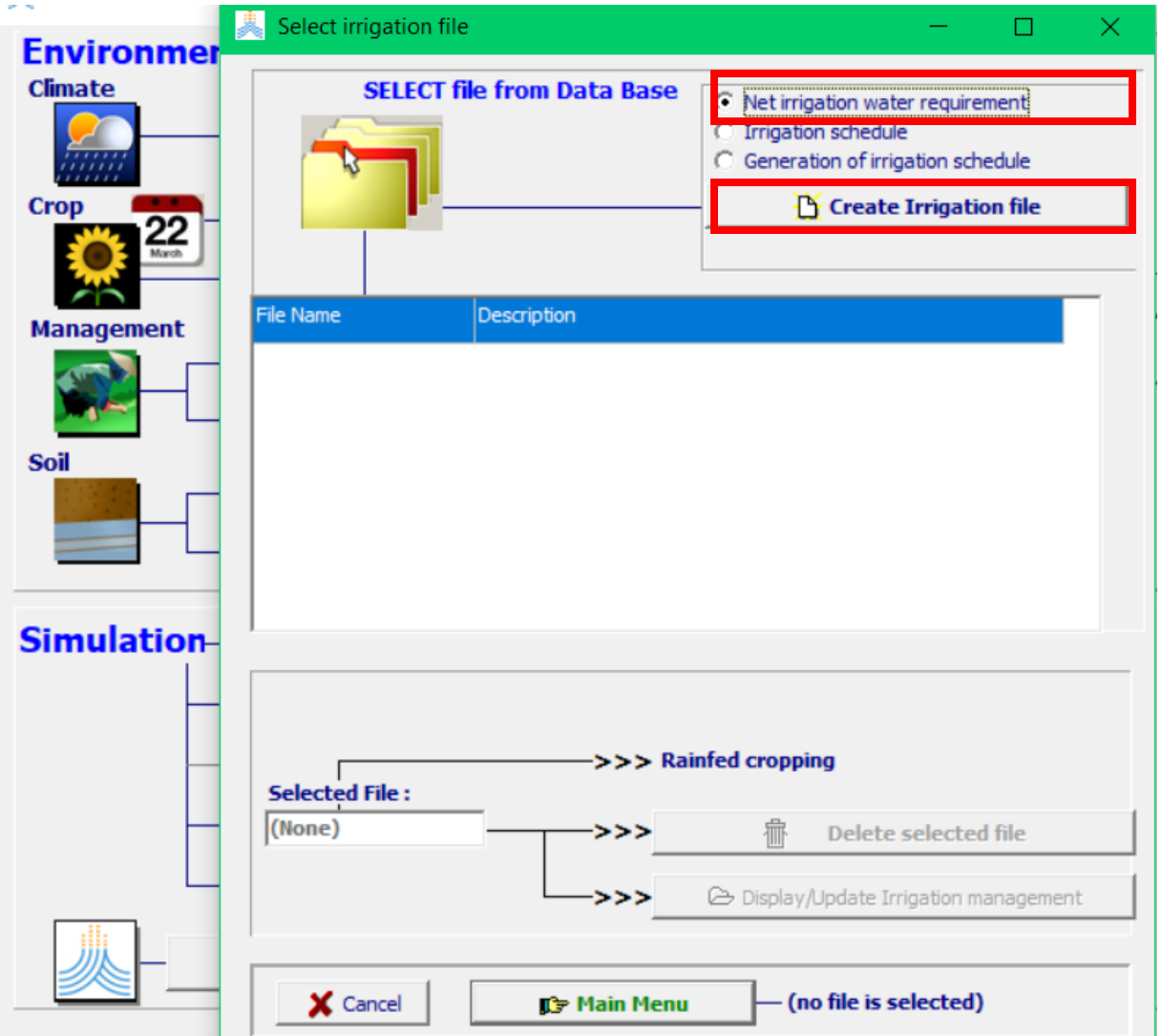


Click on **Select/Create Irrigation file**

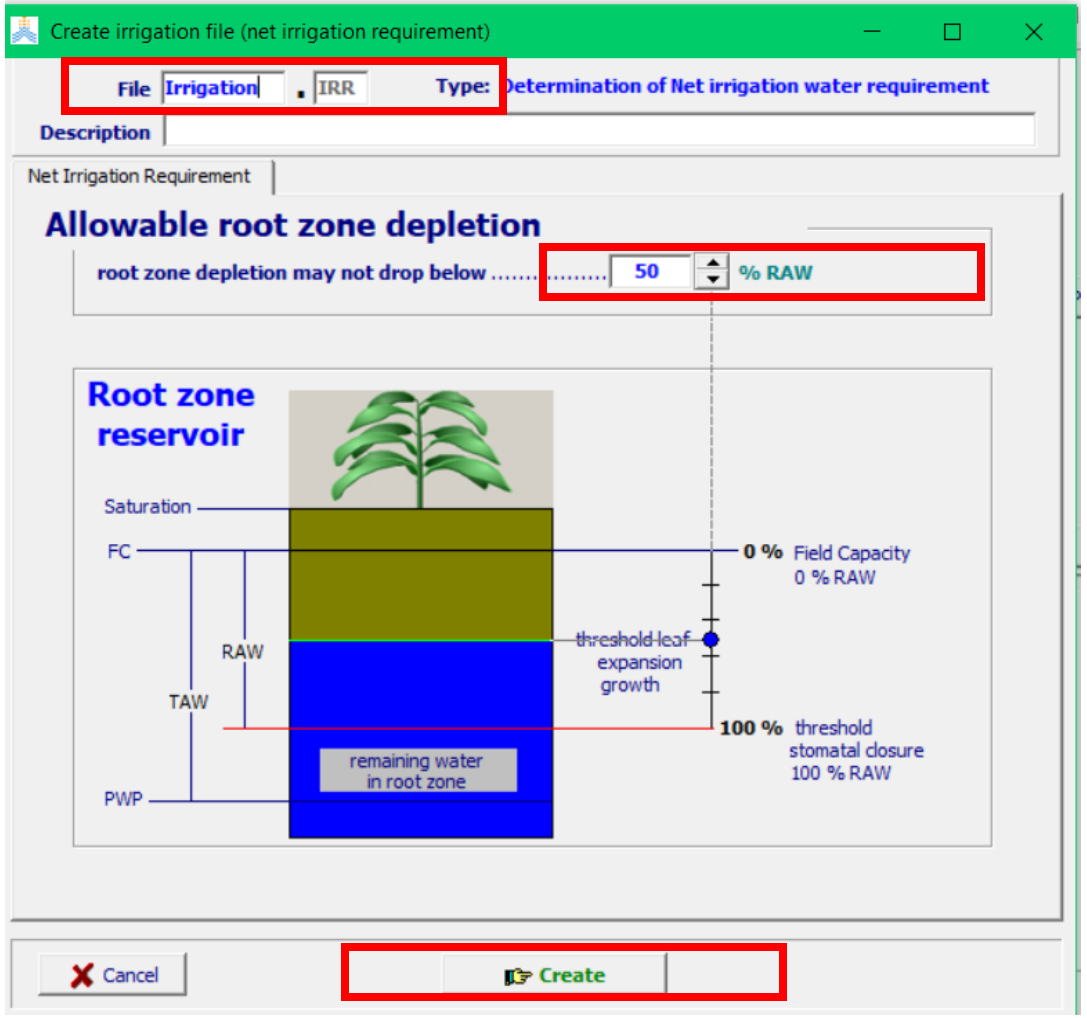


Creation of the irrigation file

- Select **Net Irrigation water requirement and Create Irrigation file**

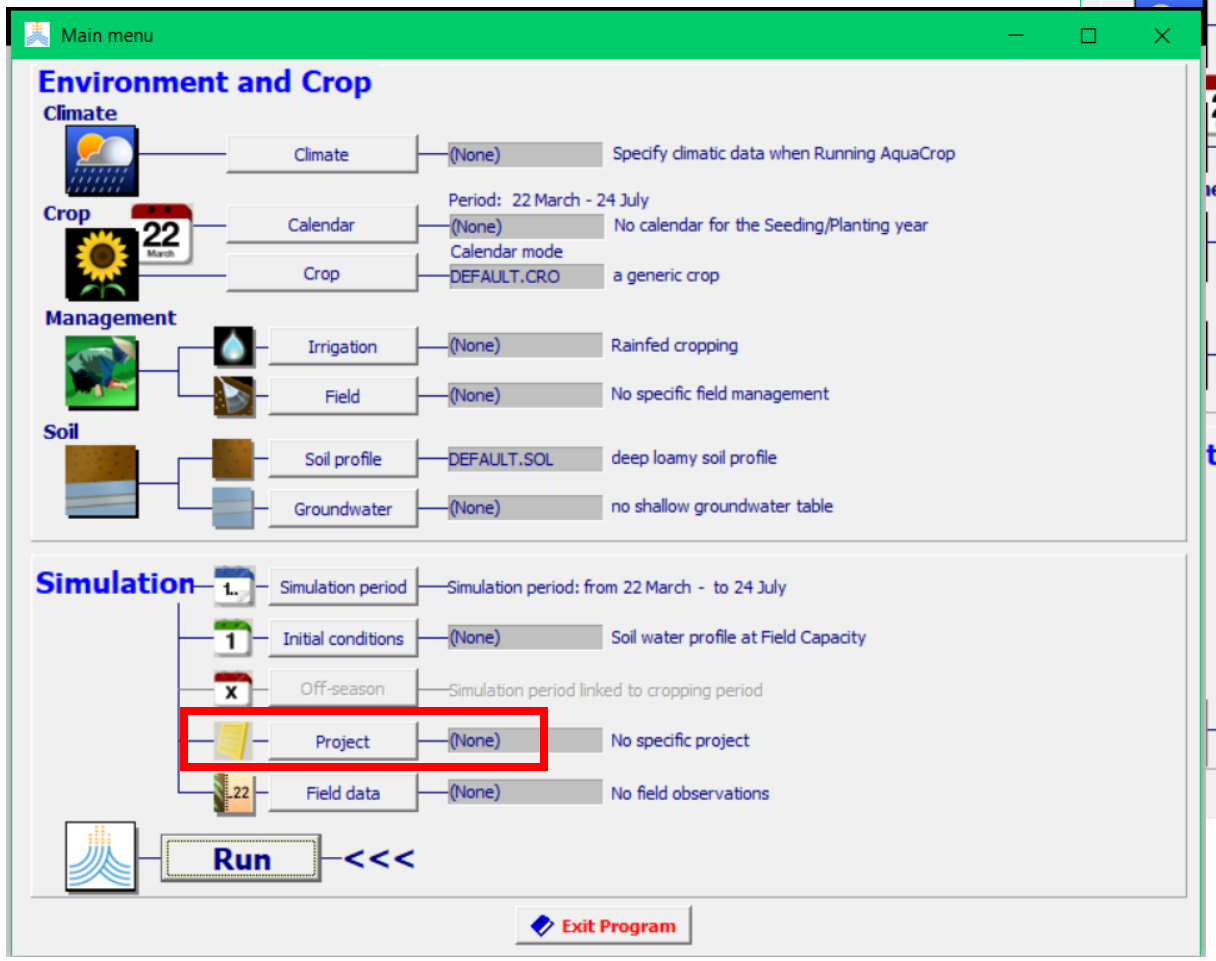


- Select the a rootzone depletion of **50%** Ready Available Water (RAW)
- Name the file as "**Irrigation**"
- Click on **Create**

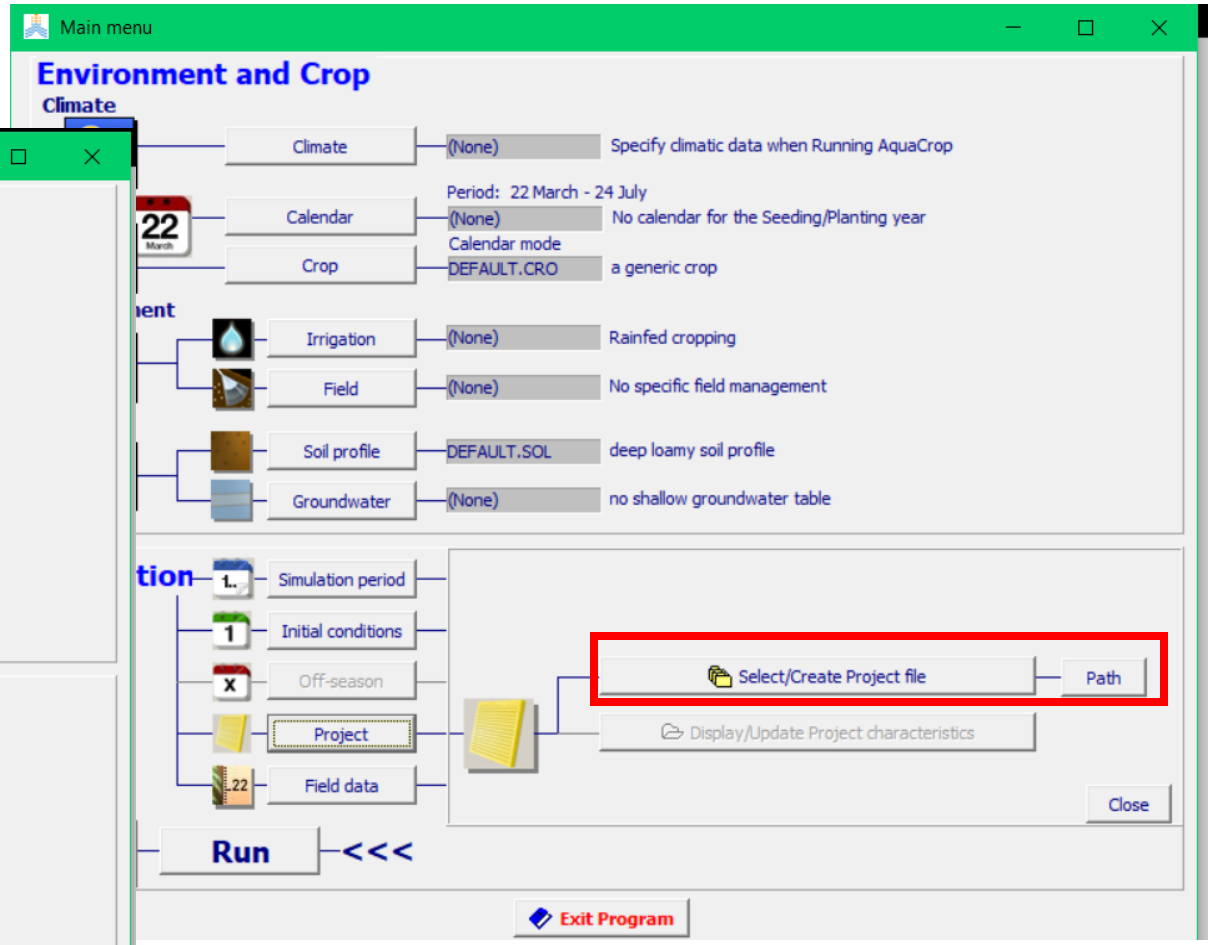


Creation of the project files (.PRM)

Press the “Project” button to create the project file

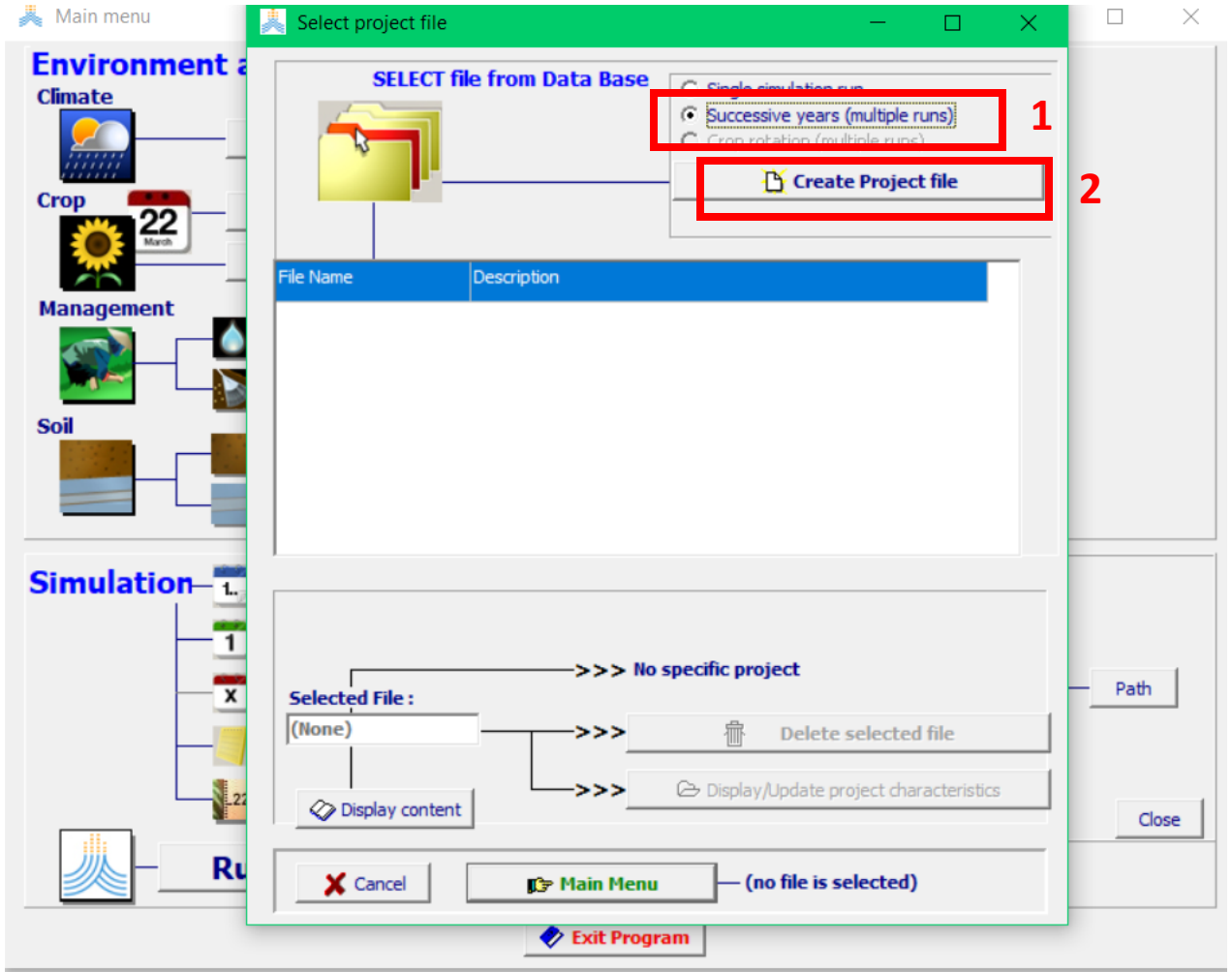


Click on “Select/Create Project file”



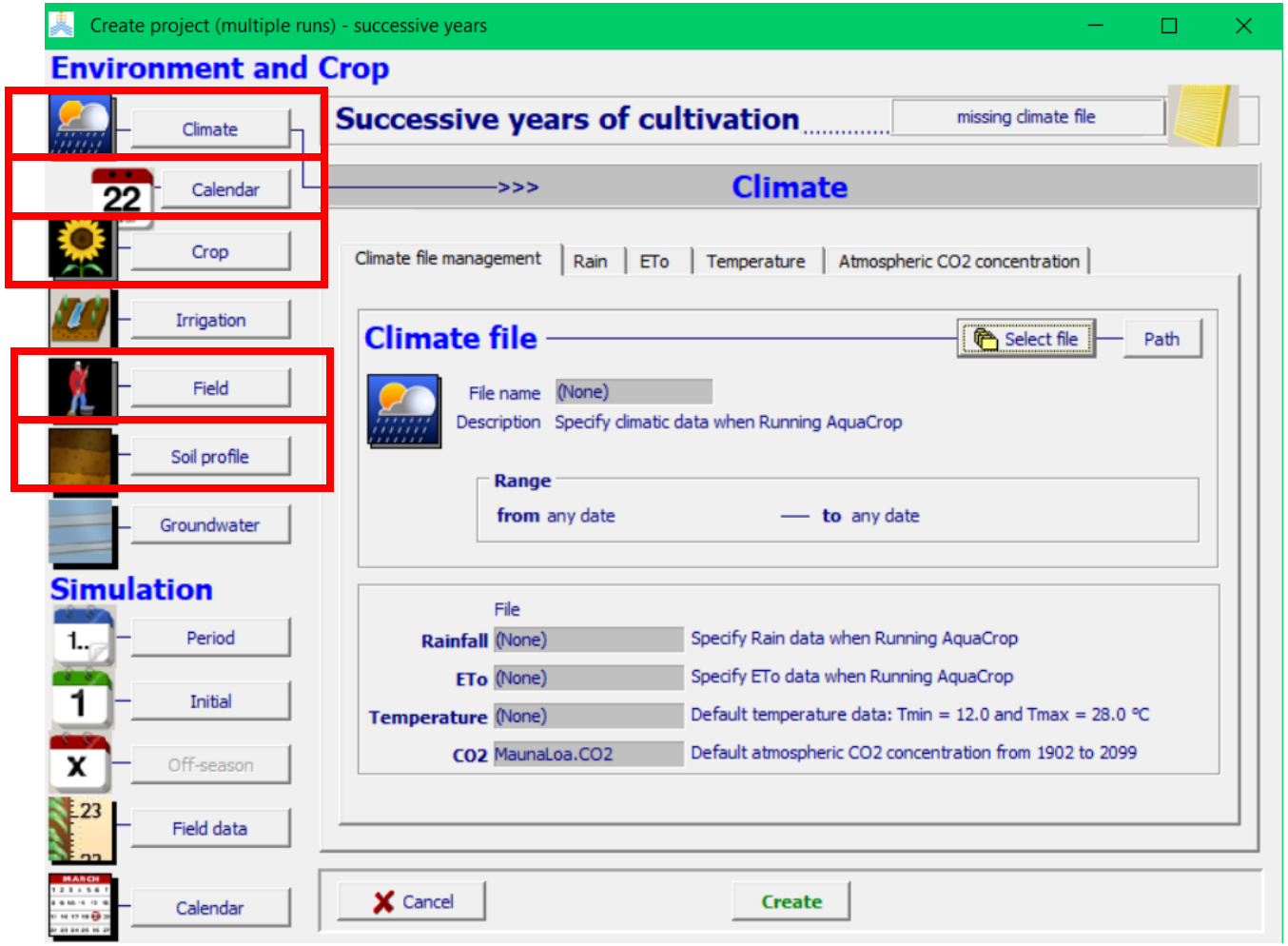
Creation of the project files (.PRM)

1. Press “successive years (multiple runs)” since we are using a climate file with data from 2030 to 2099
2. Click the below “create project file” button



Creation of the project files (.PRM)

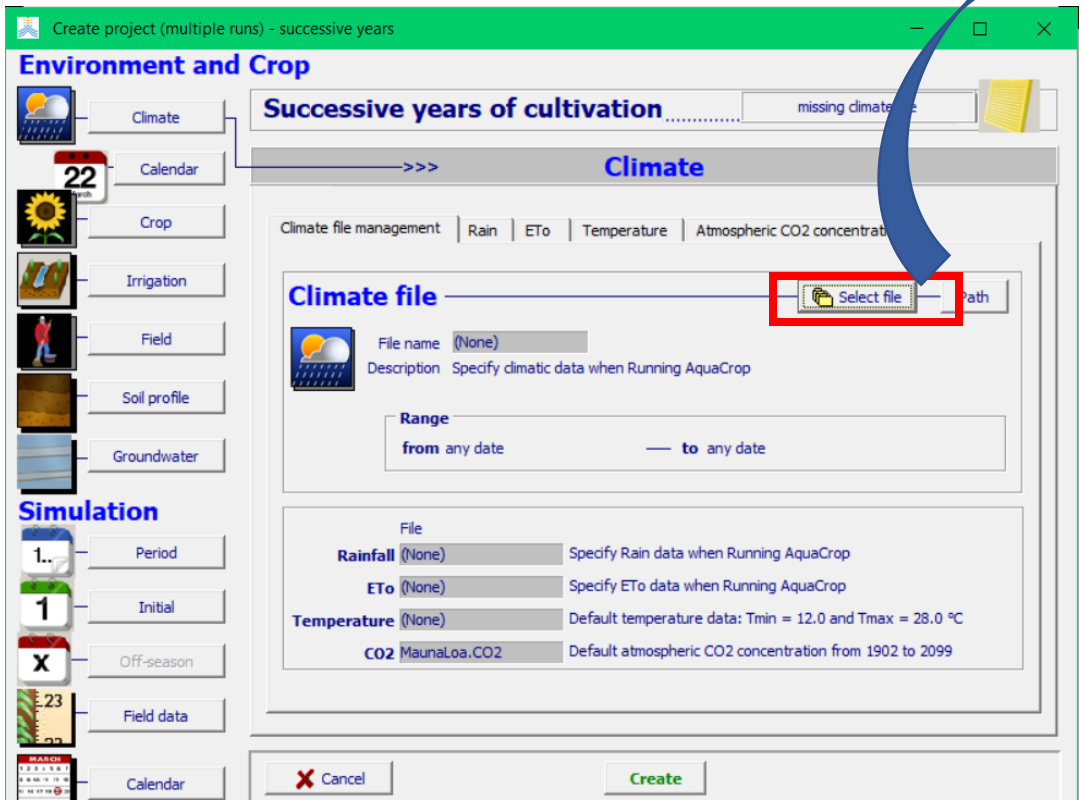
One by one, we will go through each of the highlighted components of the menu and select the correct files to create the PRM file.



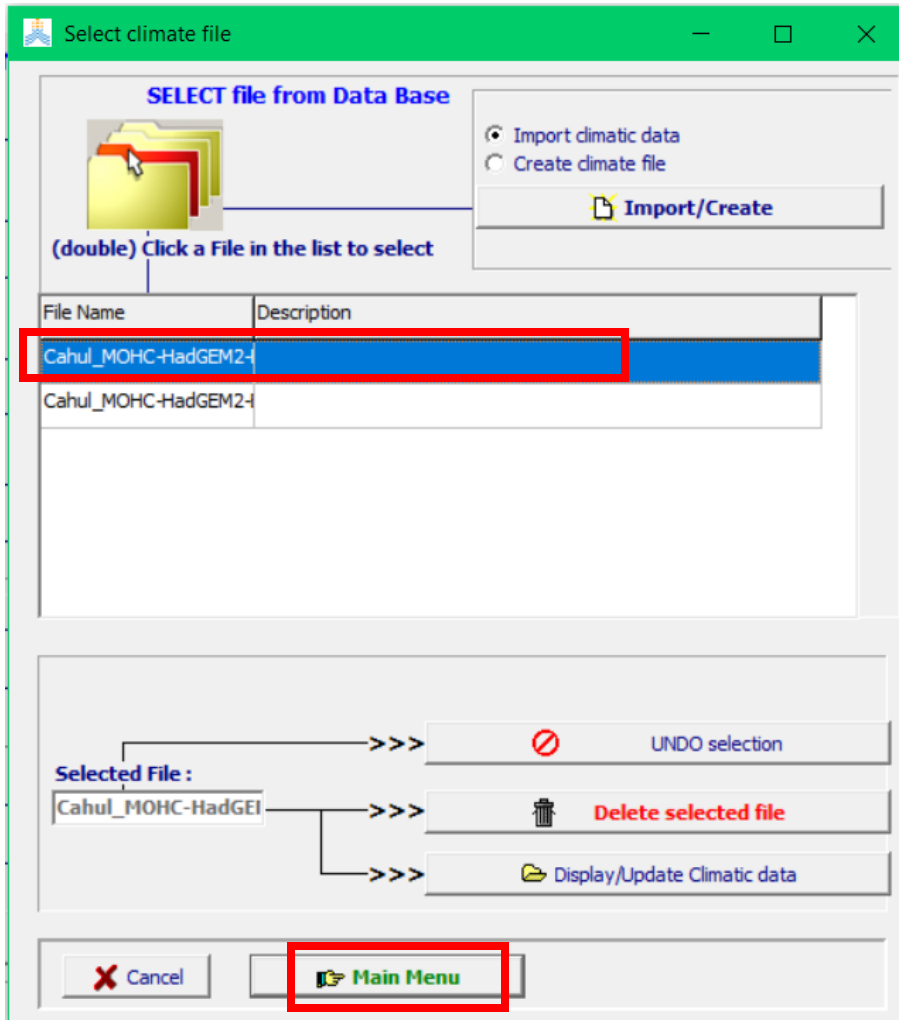
Climate module

1. Climate file

Press “Select file”



Select the first file “Cahul_MOHC-HadGEM2-”
Press the “Accept” button



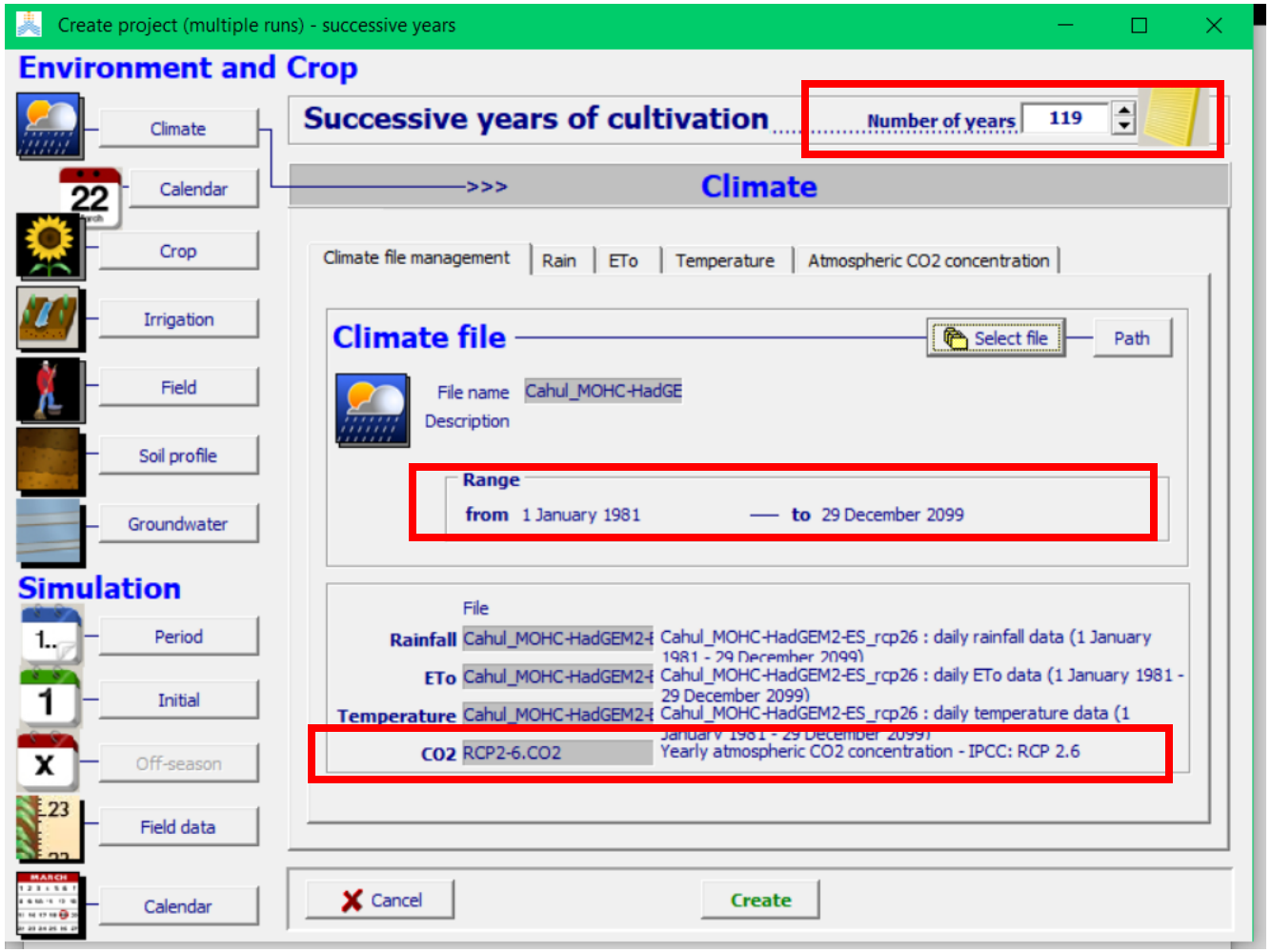
Creation of the project files (.PRM)

Here you can check the content of the selected file:

- **119 years**: 1 January 1981 to 29 December 2099

- **MOHC**: Global Climate Model

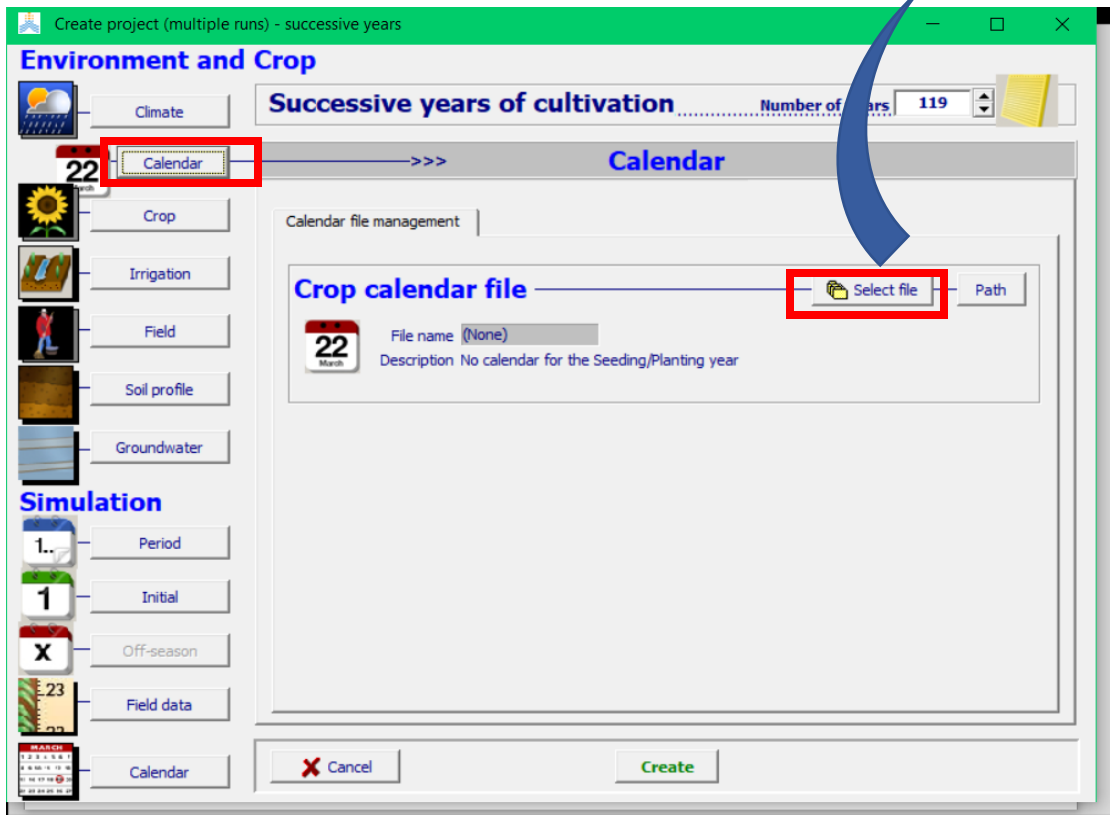
- **RCP2.6**: representative concentration pathway (2.6 - low emission scenario)



Calendar module

2. Calendar file

Press “Select file”

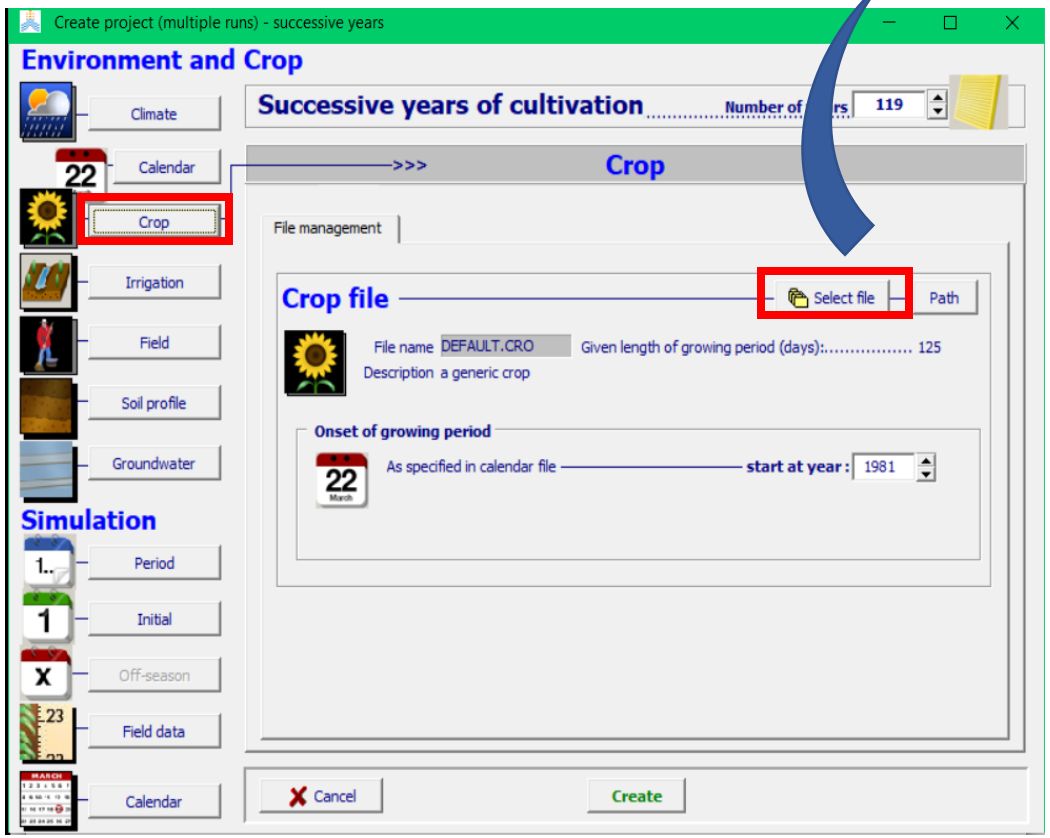


Select the file “10May”
Press the “Accept” button

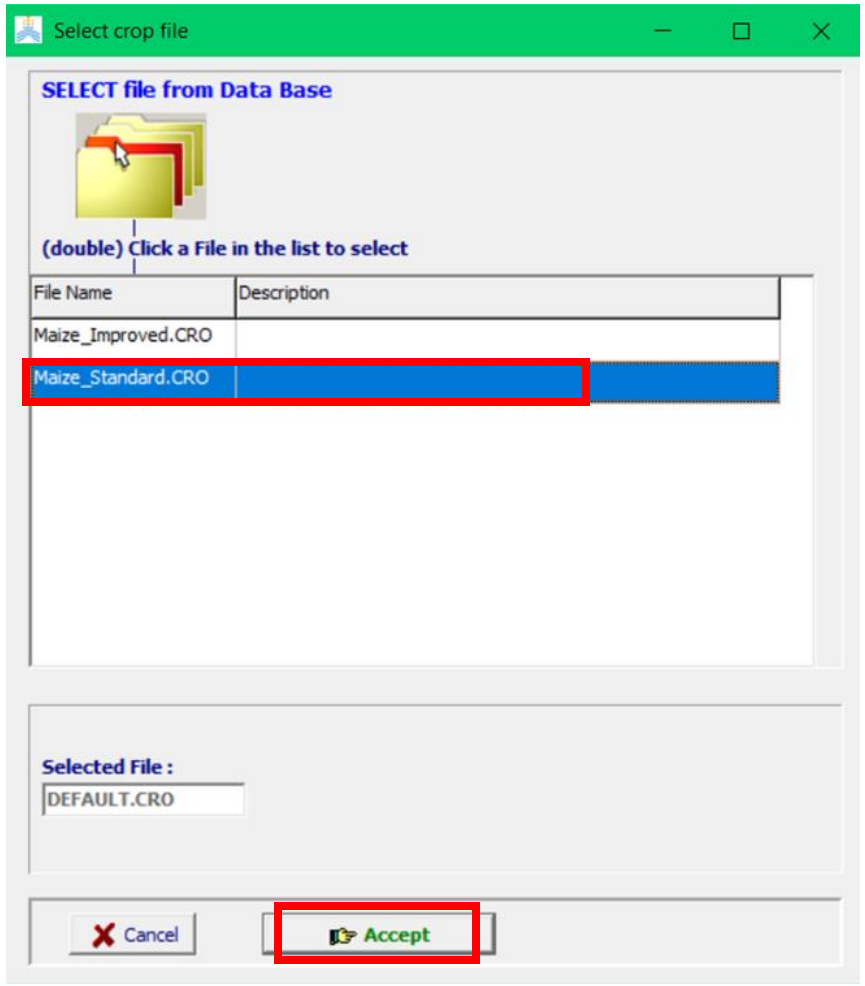
Crop module

3. Crop file

Press “Select file”

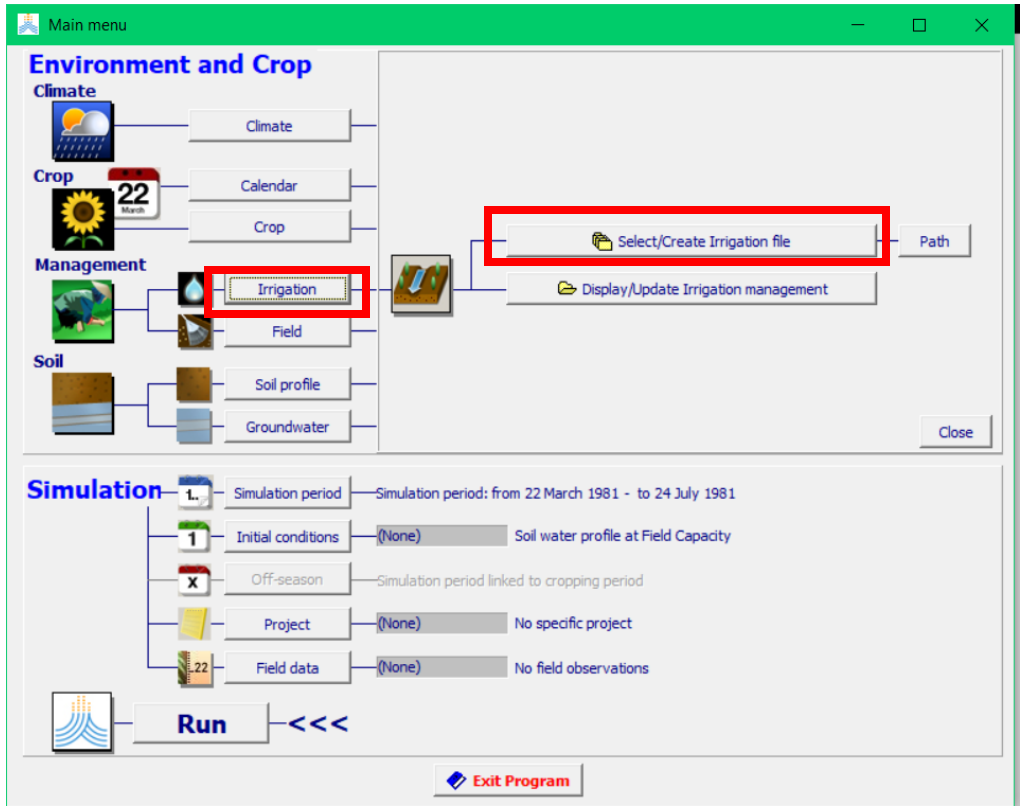


Select the file “Maize-Short”
Press the “Accept” button

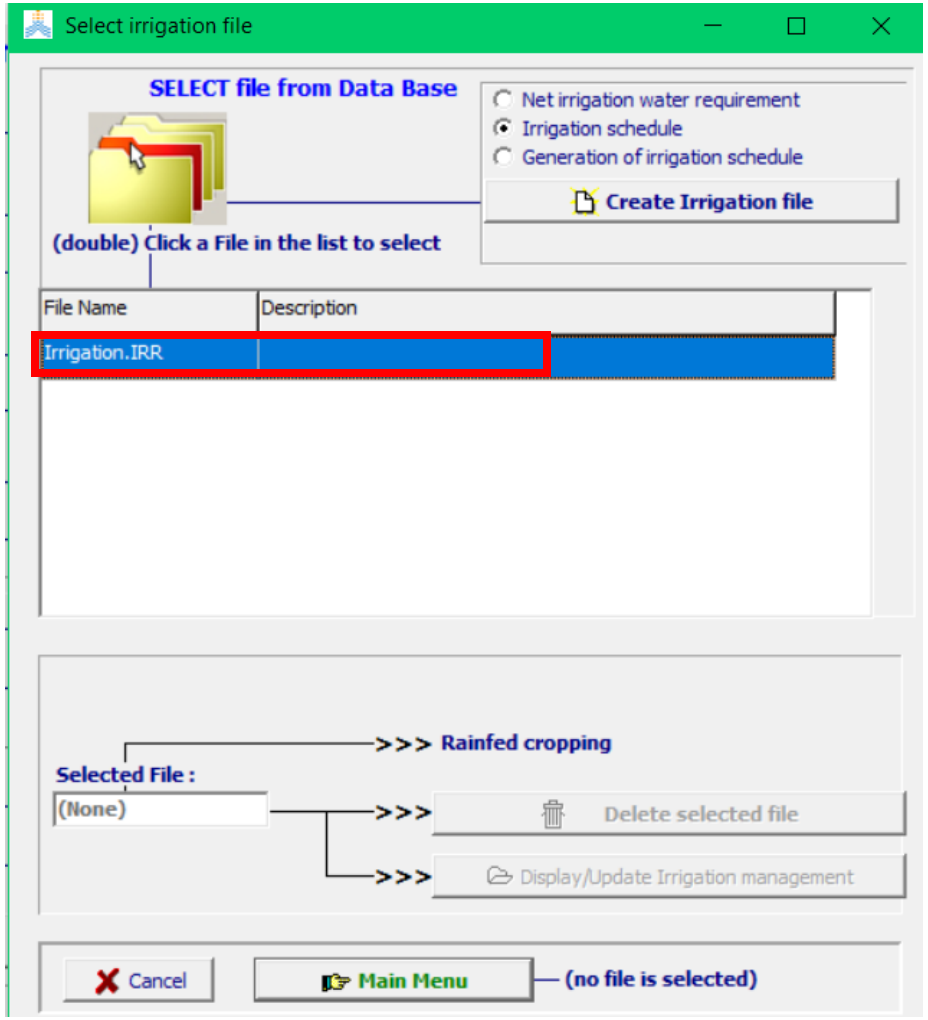


4. Irrigation file

Press “Select file”

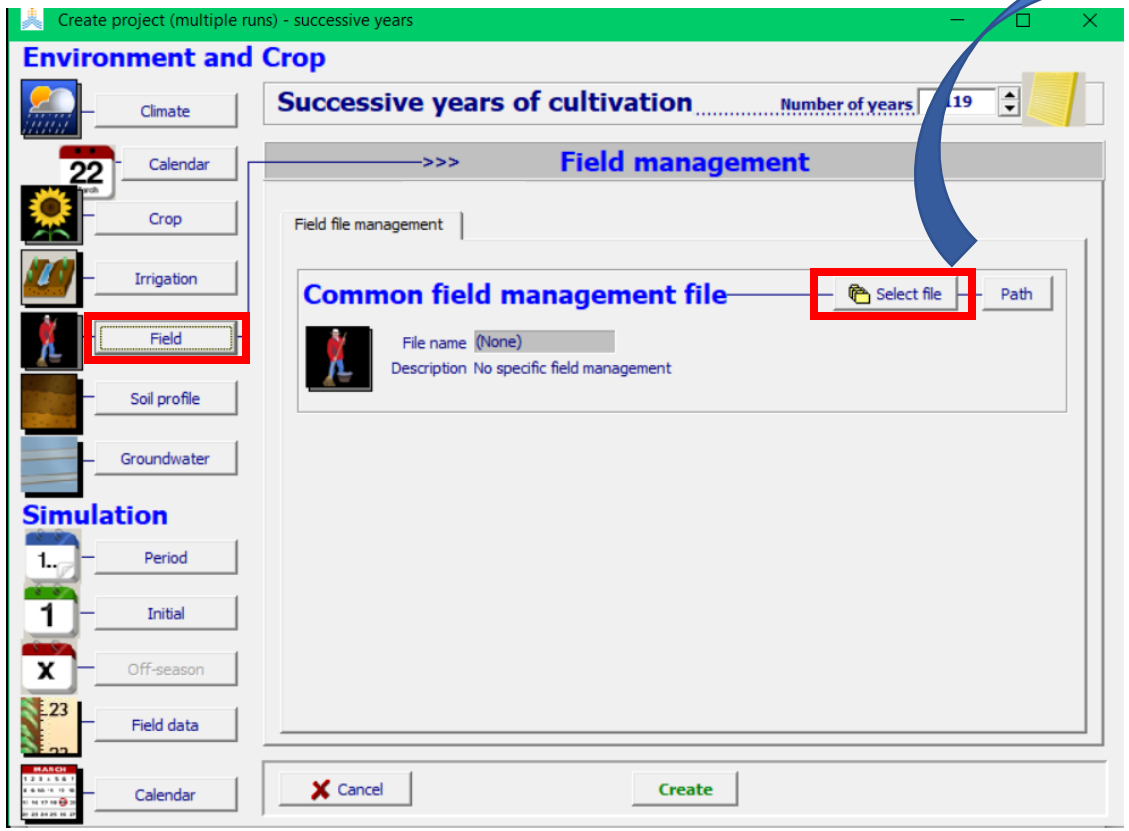


Double click on Irrigation.IRR file

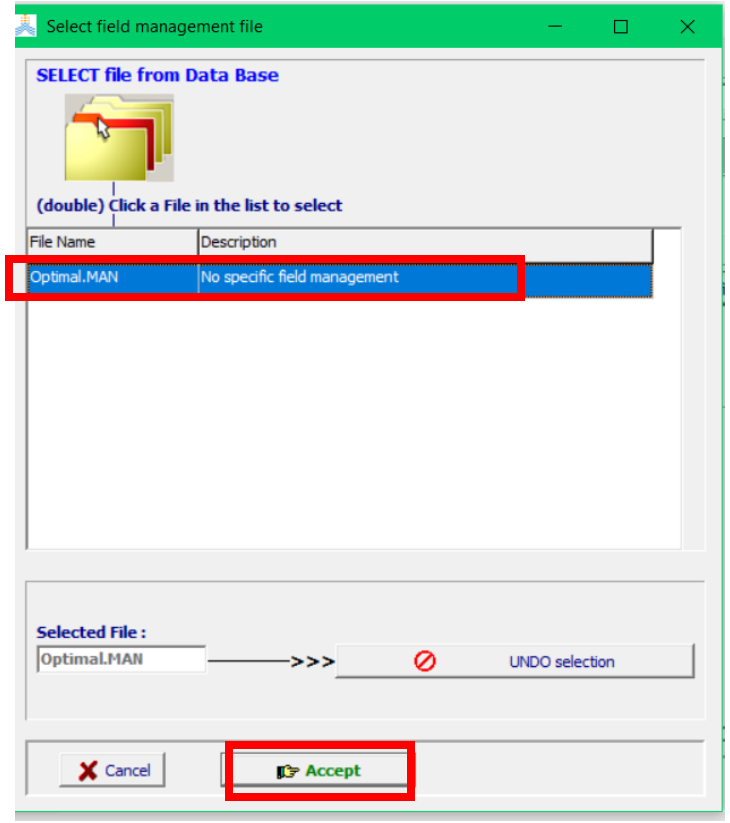


4. Field management file

Press “Select file”

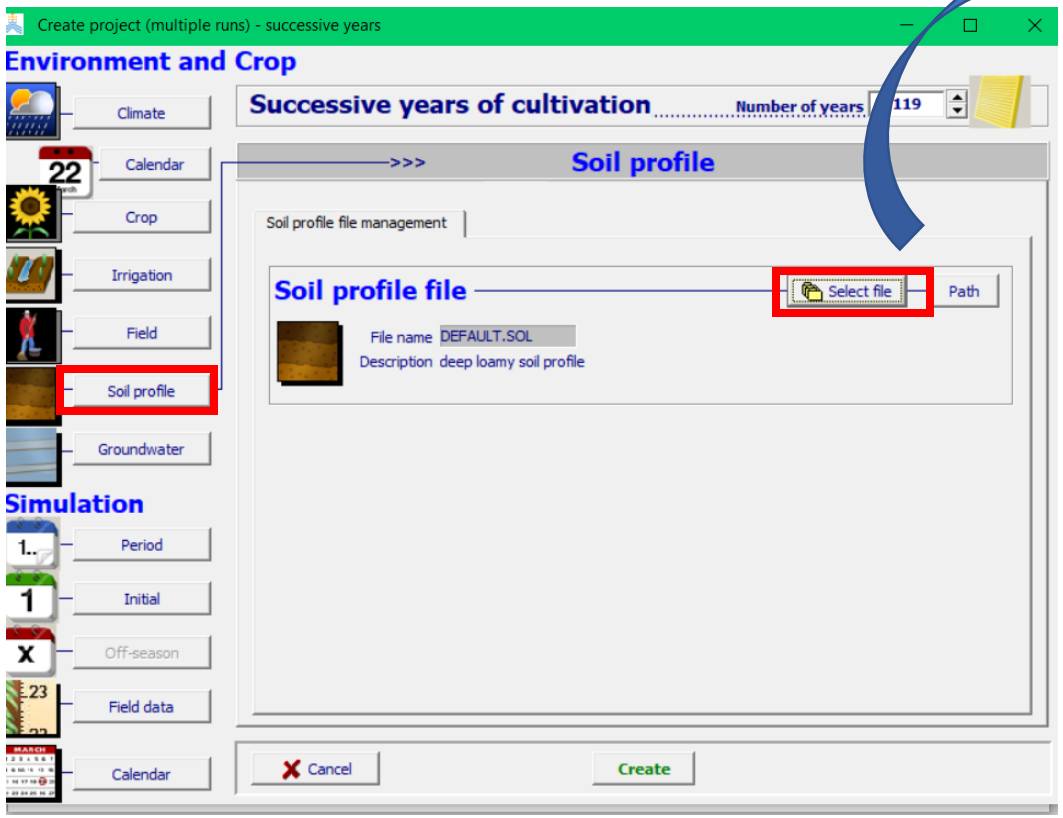


Select the file “Optimal”
Press the “Accept” button

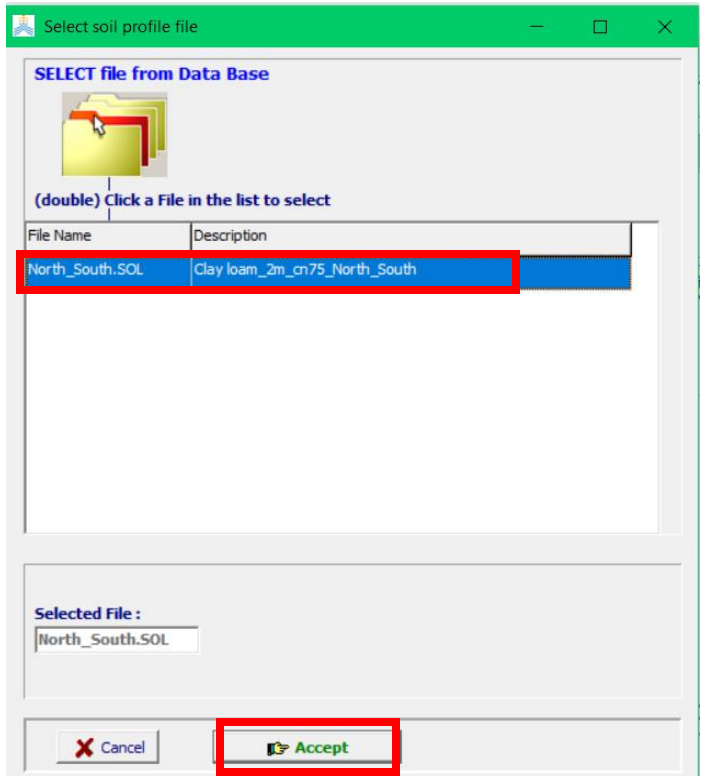


5. Soil file

Press “Select file”

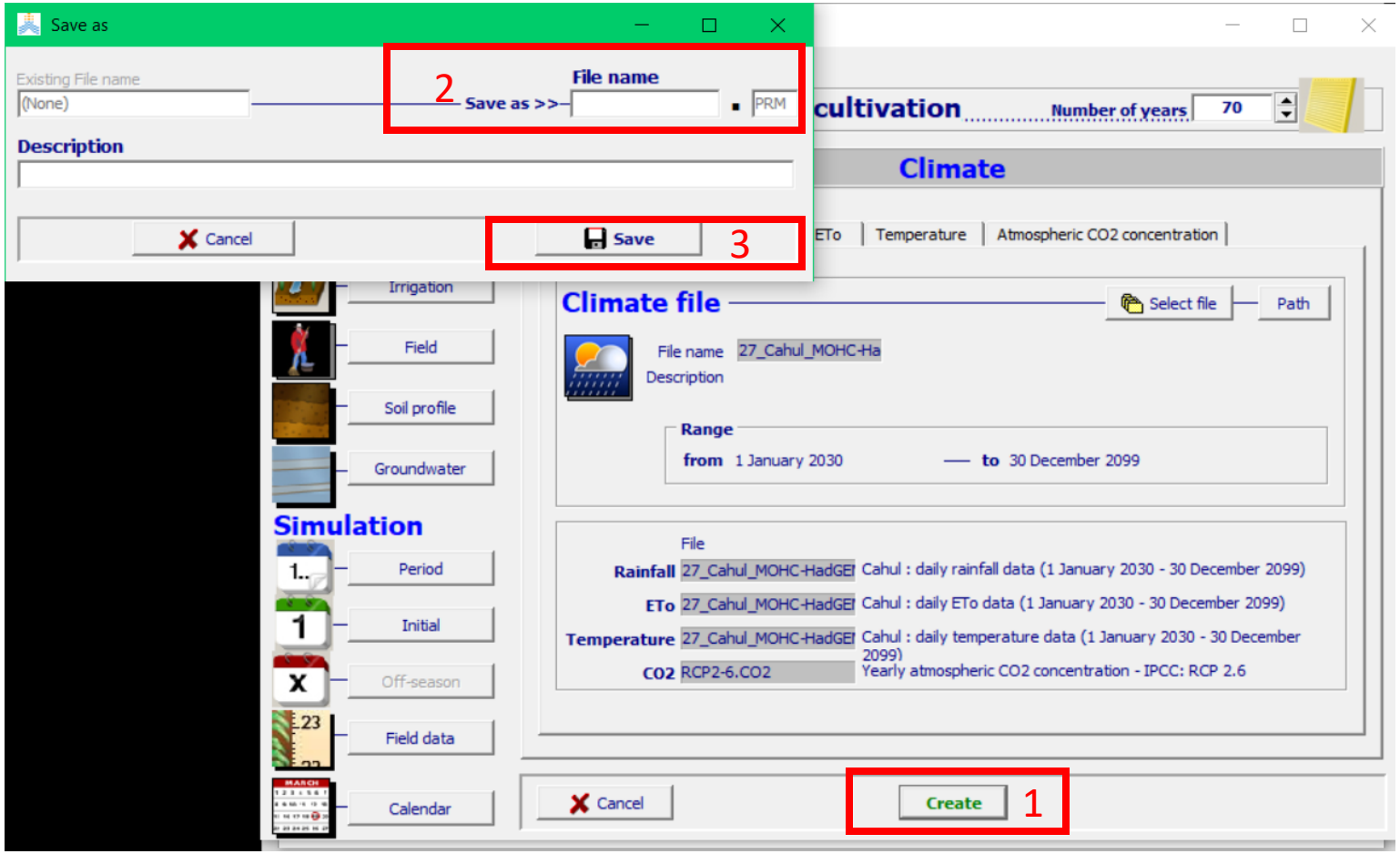


Select the file “North_South”
Press the “Accept” button



Saving project files (.PRM)

1. Press “CREATE”
2. Fill the “File name” with the name: **Maize_Irrigated_Cahul_10May_26_MOHC**
3. Press the “Save” button



Creation of new project files (.PRM)

HOW TO CREATE OTHER PROJECT FILES WITH DIFFERENT VARIABLES

Creation of new project files (.PRM)

Variables scheme

Maize_Irrigated_Cahul_10May_26_MOHC [X]

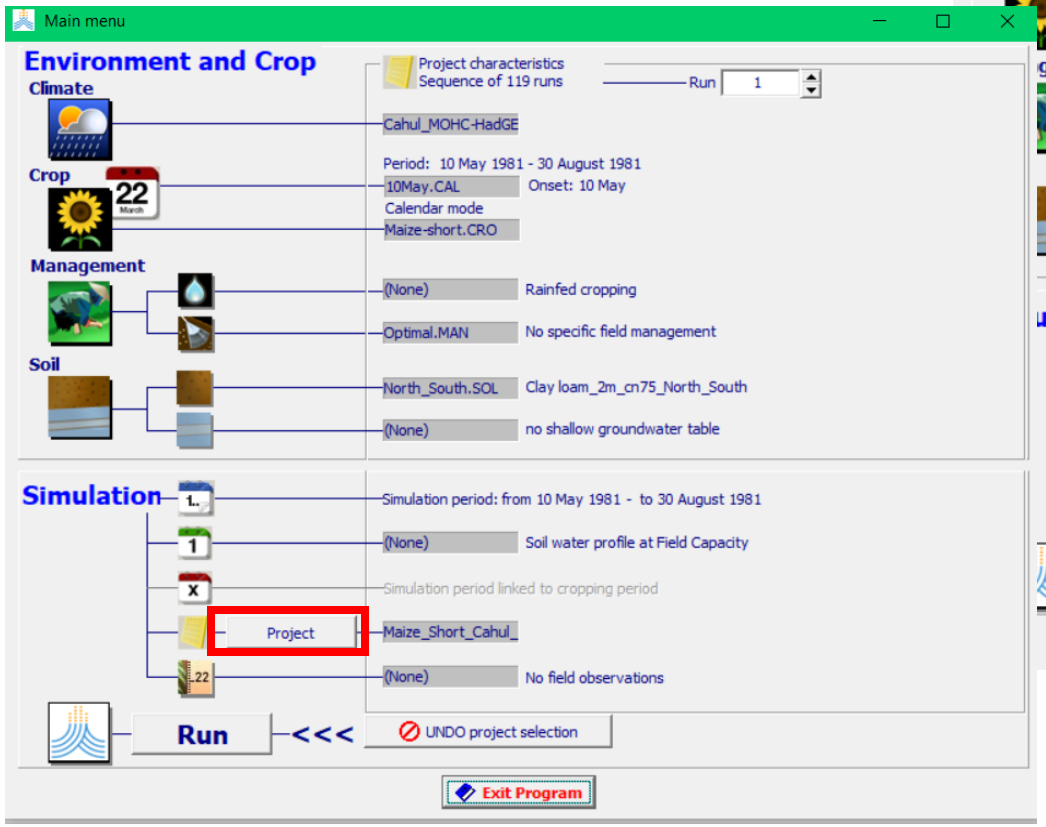
Maize_Irrigated_Cahul_10May_85_MOHC [ ] Step → Change the Climate file to Cahul RCP 8.5

Maize_Rainfed_Cahul_10May_26_MOHC [ ] Step → Change the Irrigation file

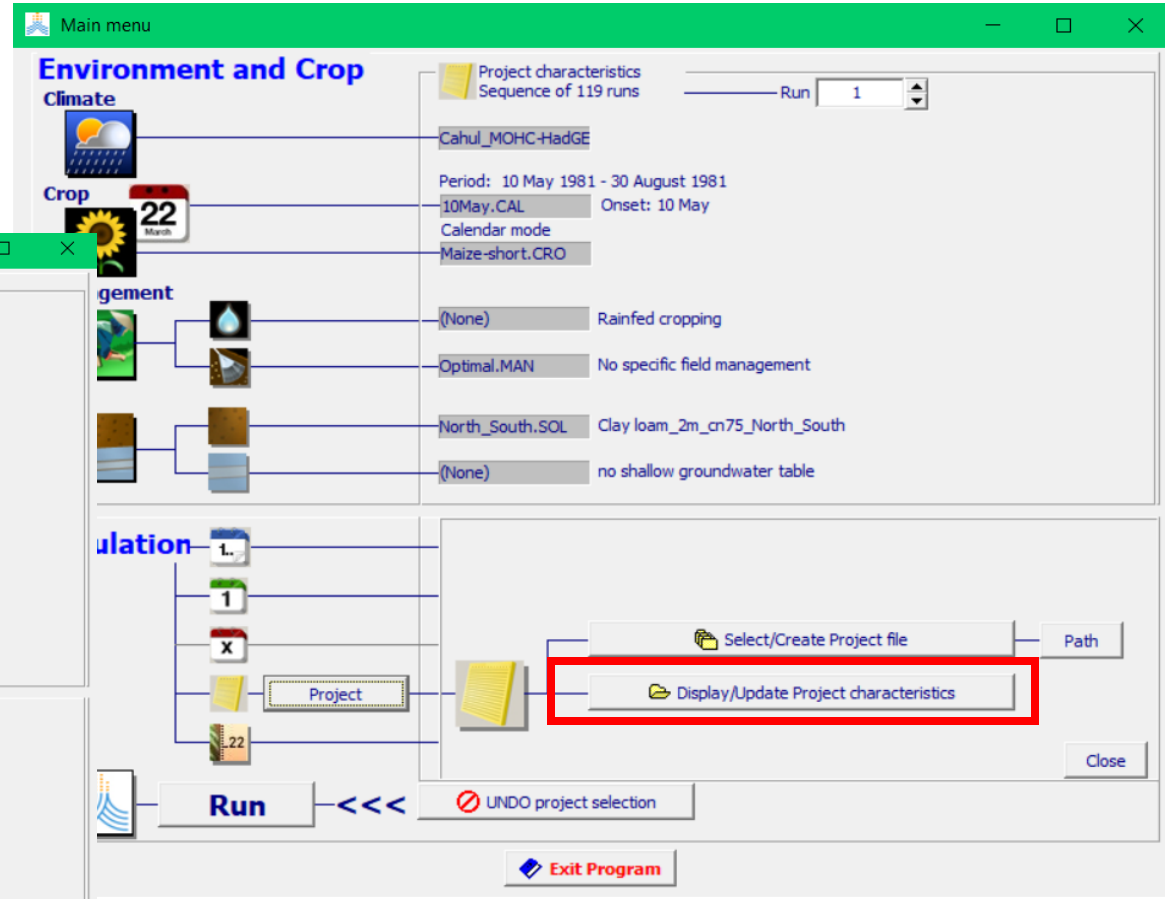
Maize_Rainfed_Cahul_10May_85_MOHC [ ] Step → Change the Irrigation file

Creation of new project files (.PRM)

1. Press “Project” button

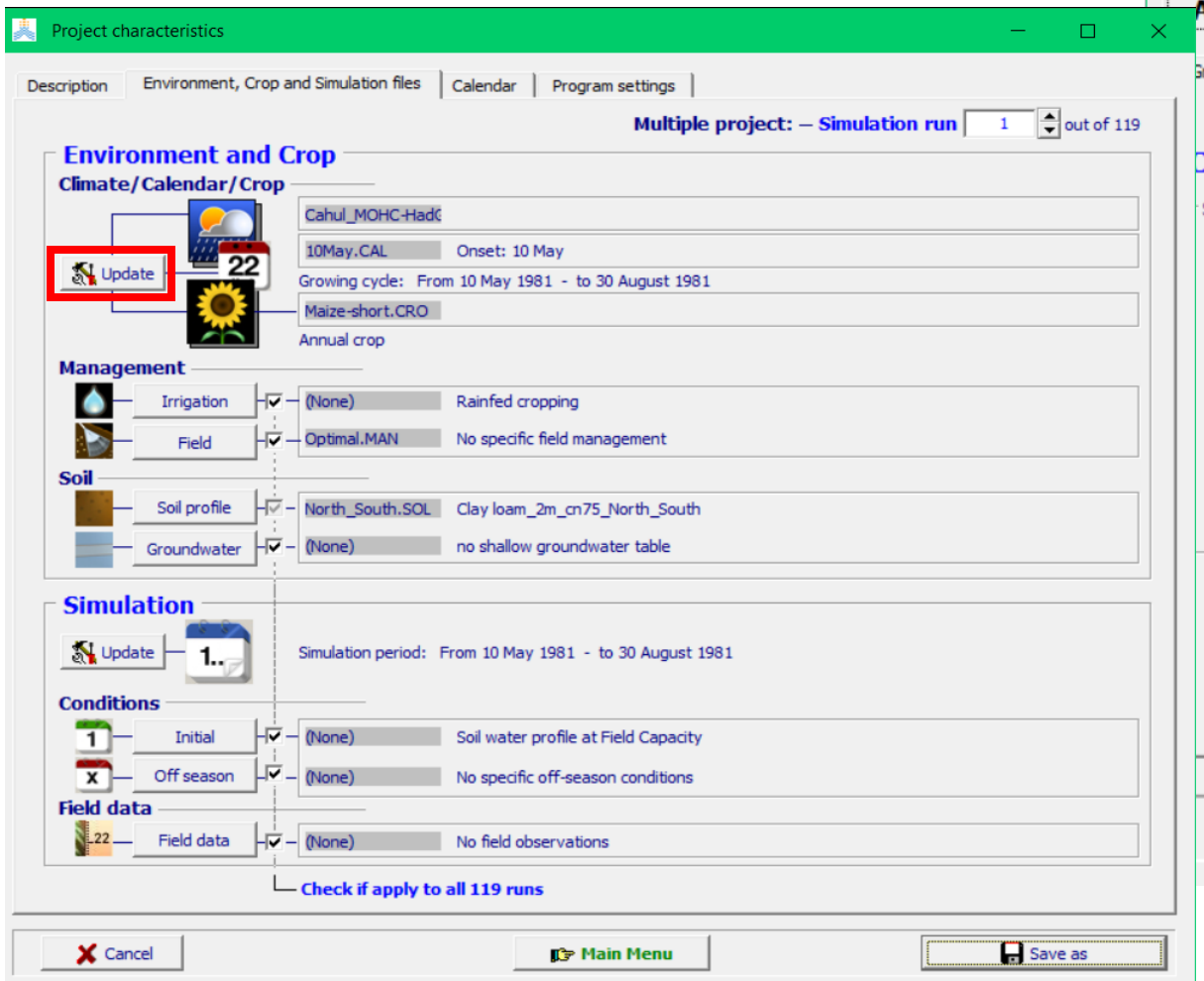


2. Select Display/Update Project characteristics

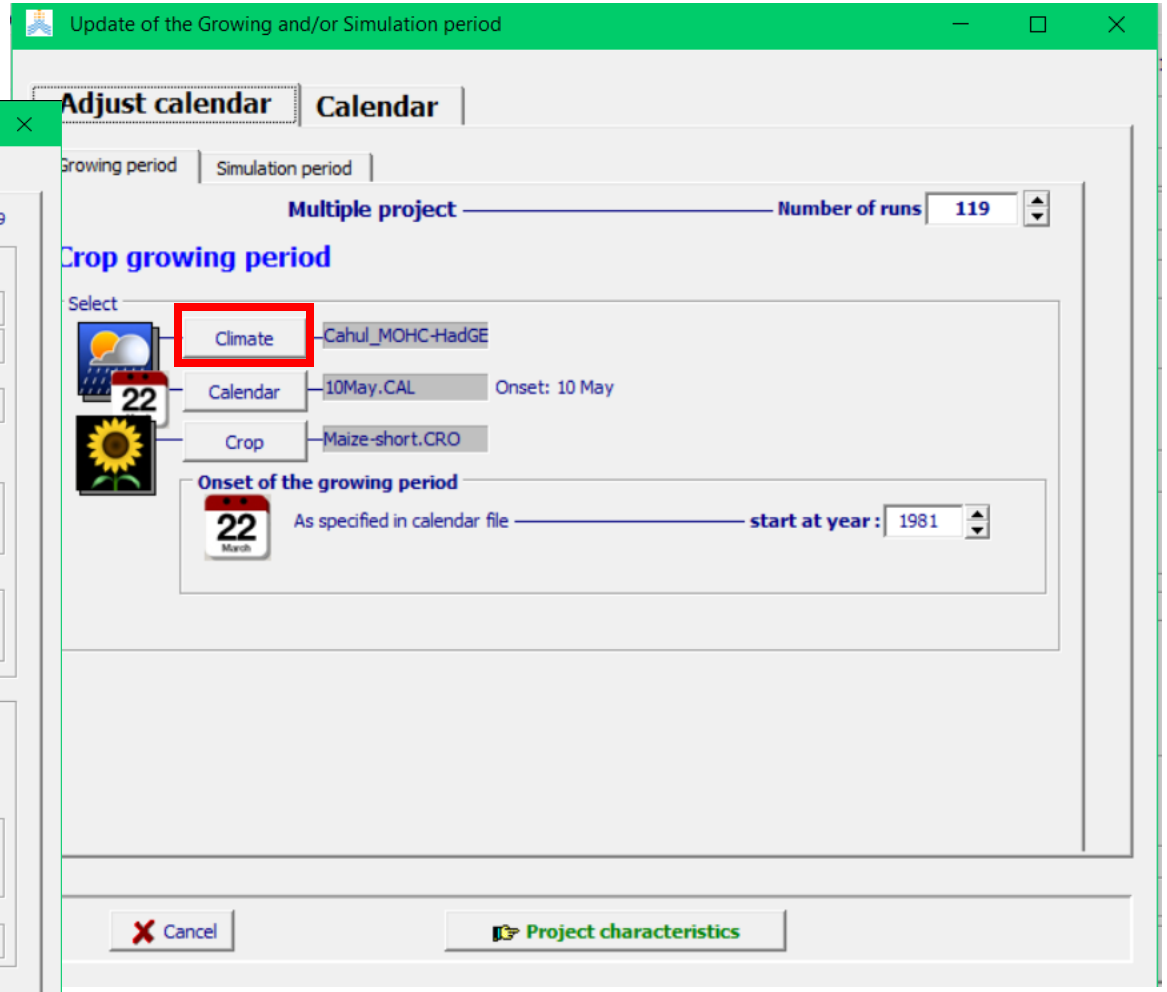


Creation of new project files (.PRM)

3. Press “Update” button

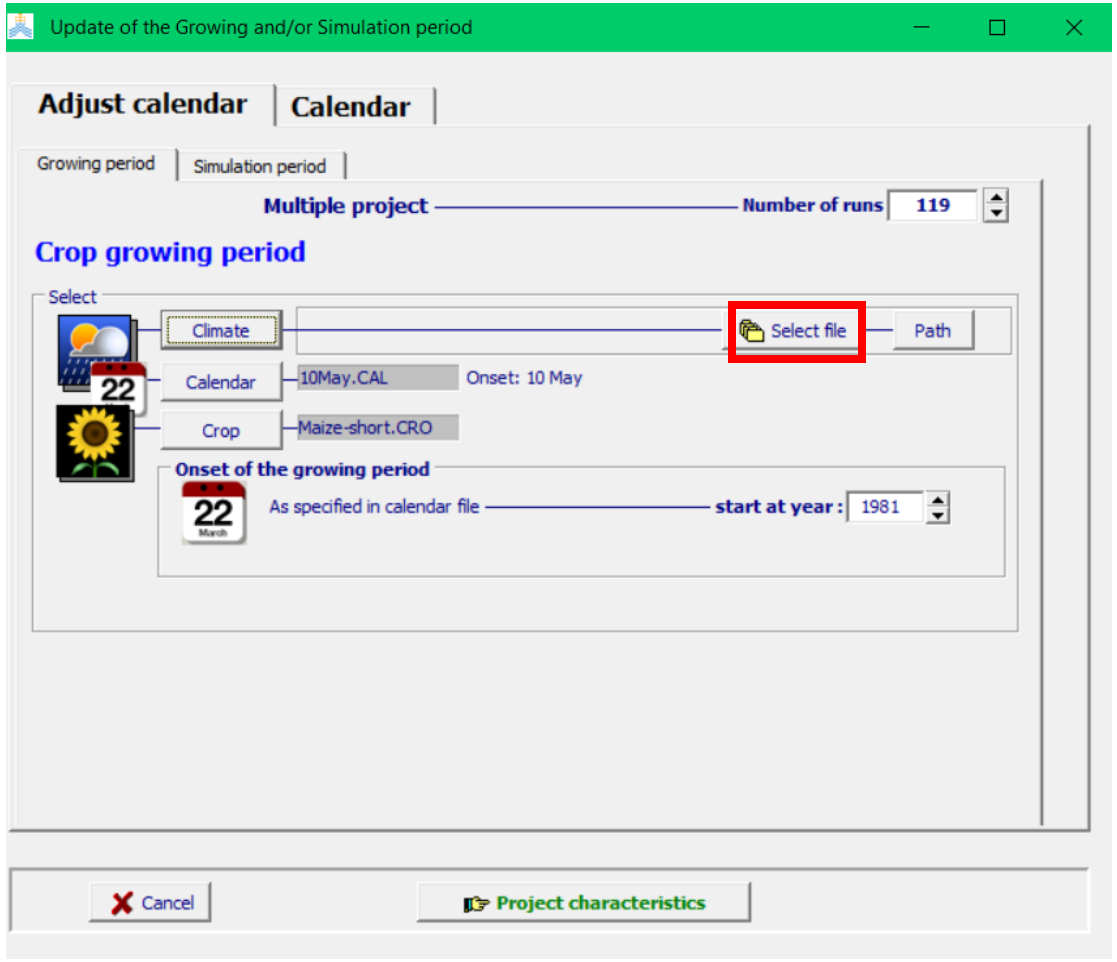


4. Click on Climate

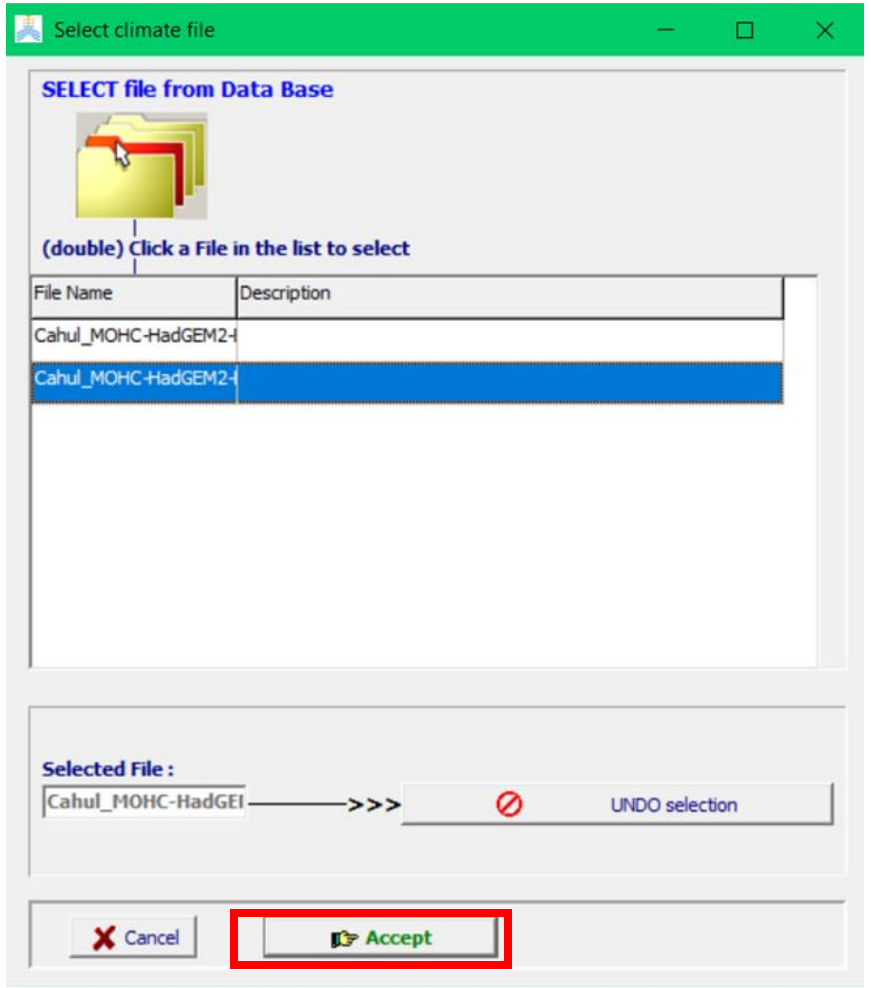


Creation of new project files (.PRM)

5. Click on “Select file”



6. Select the second file “Cahul_MOHC-HadGEM2-”

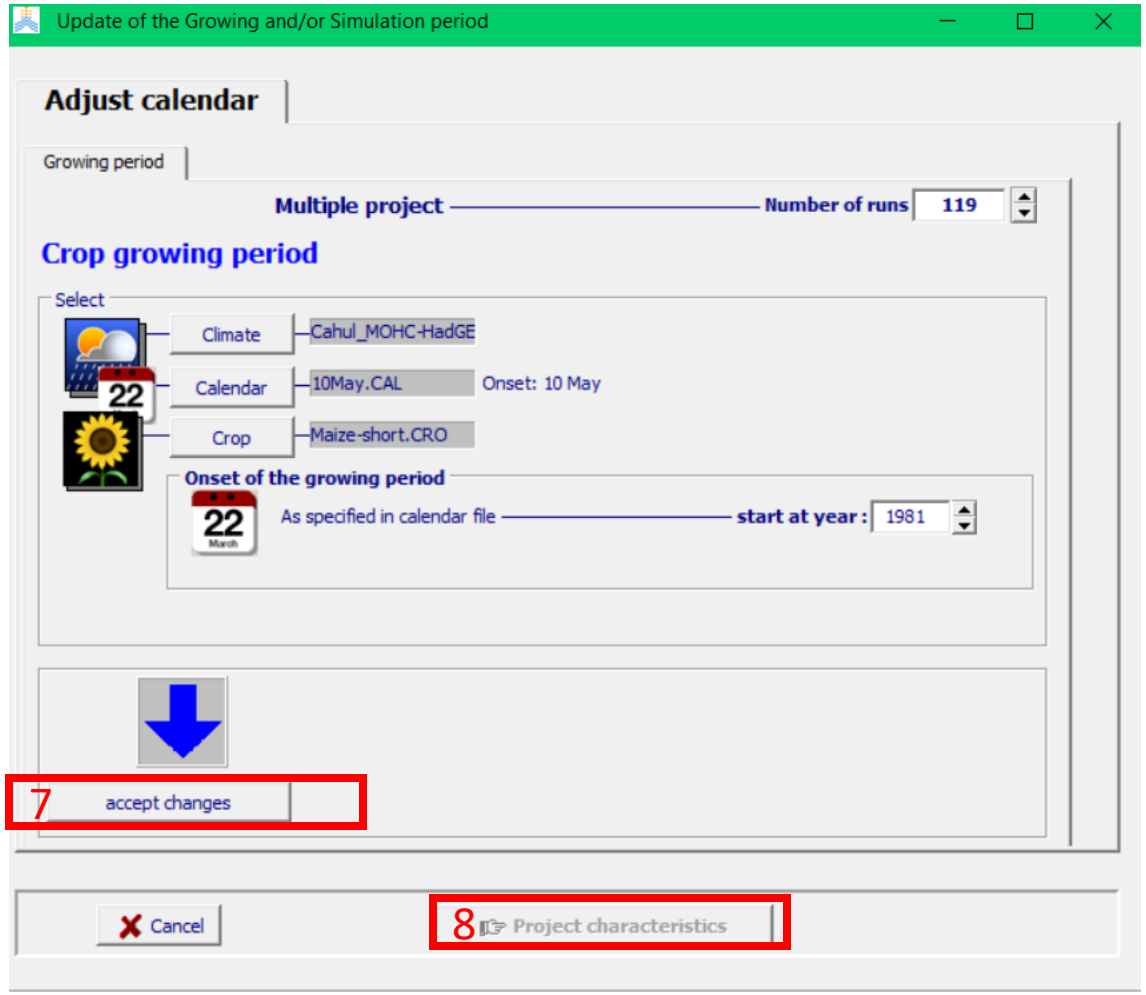


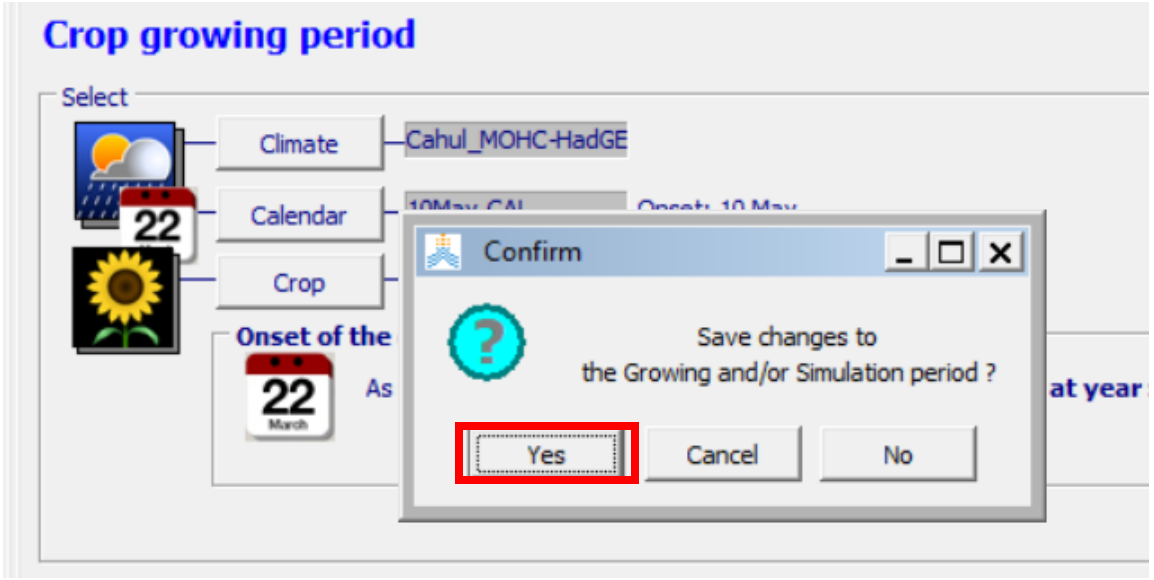
Creation of new project files (.PRM)

7. Press “Accept changes” button

8. Click on “Project Characteristics” to go back on the main project page

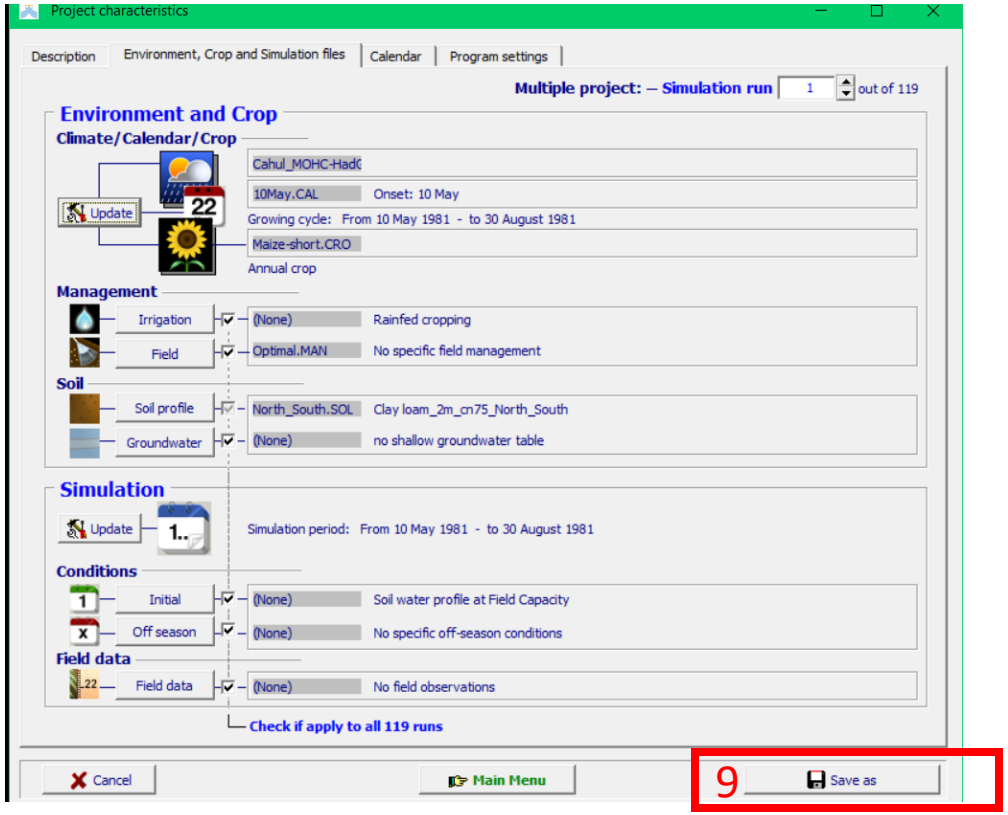
9. Select "Yes"

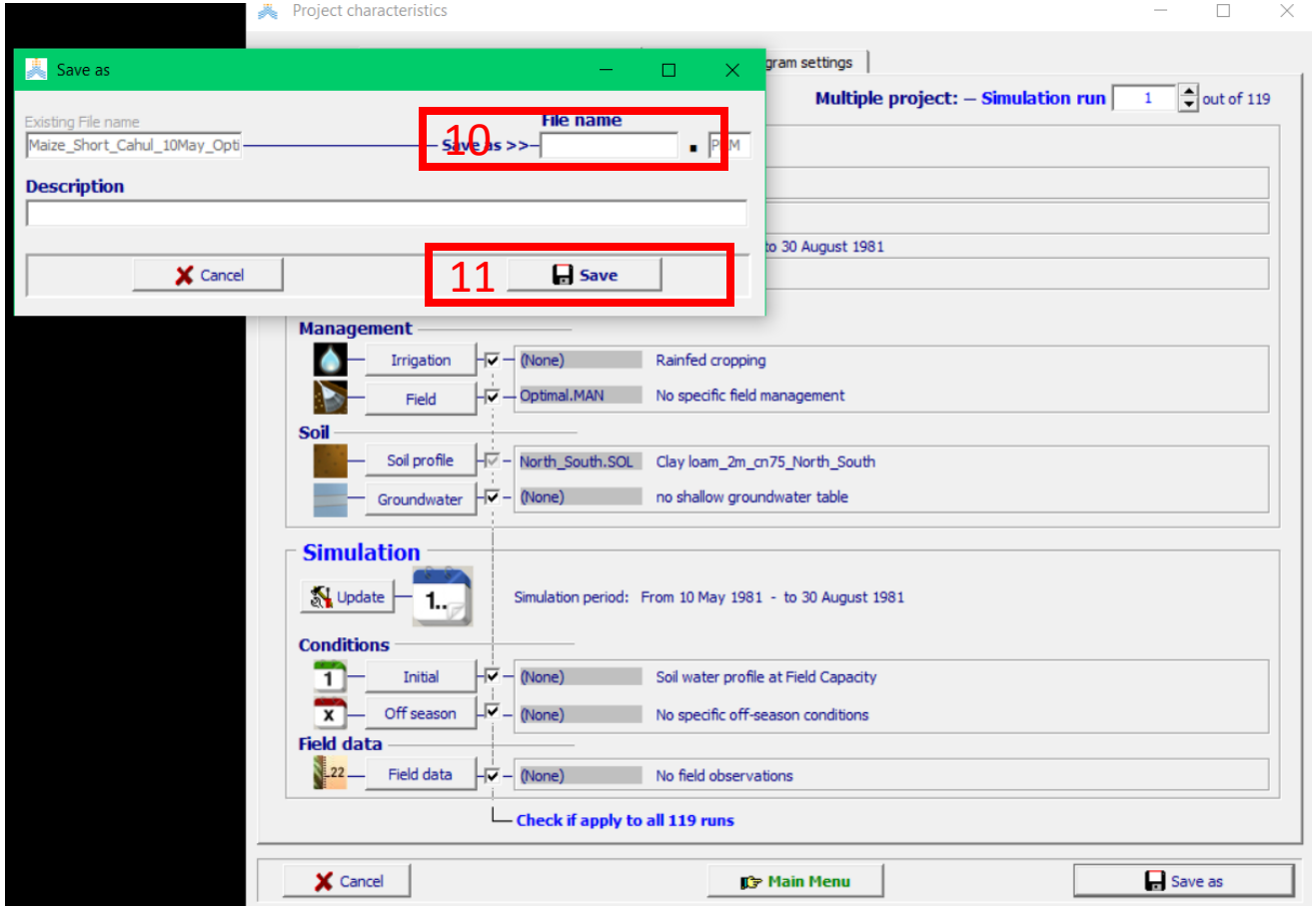




Creation of new project files (.PRM)

9. Press “Save as” button
10. Fill the “File name” with: Maize_Irrigated_Cahul_10May_85_MOHC
11. Press the “Save” button





Creation of new project files (.PRM)

Variables scheme

Maize_Irrigated_Cahul_10May_26_MOHC [X]

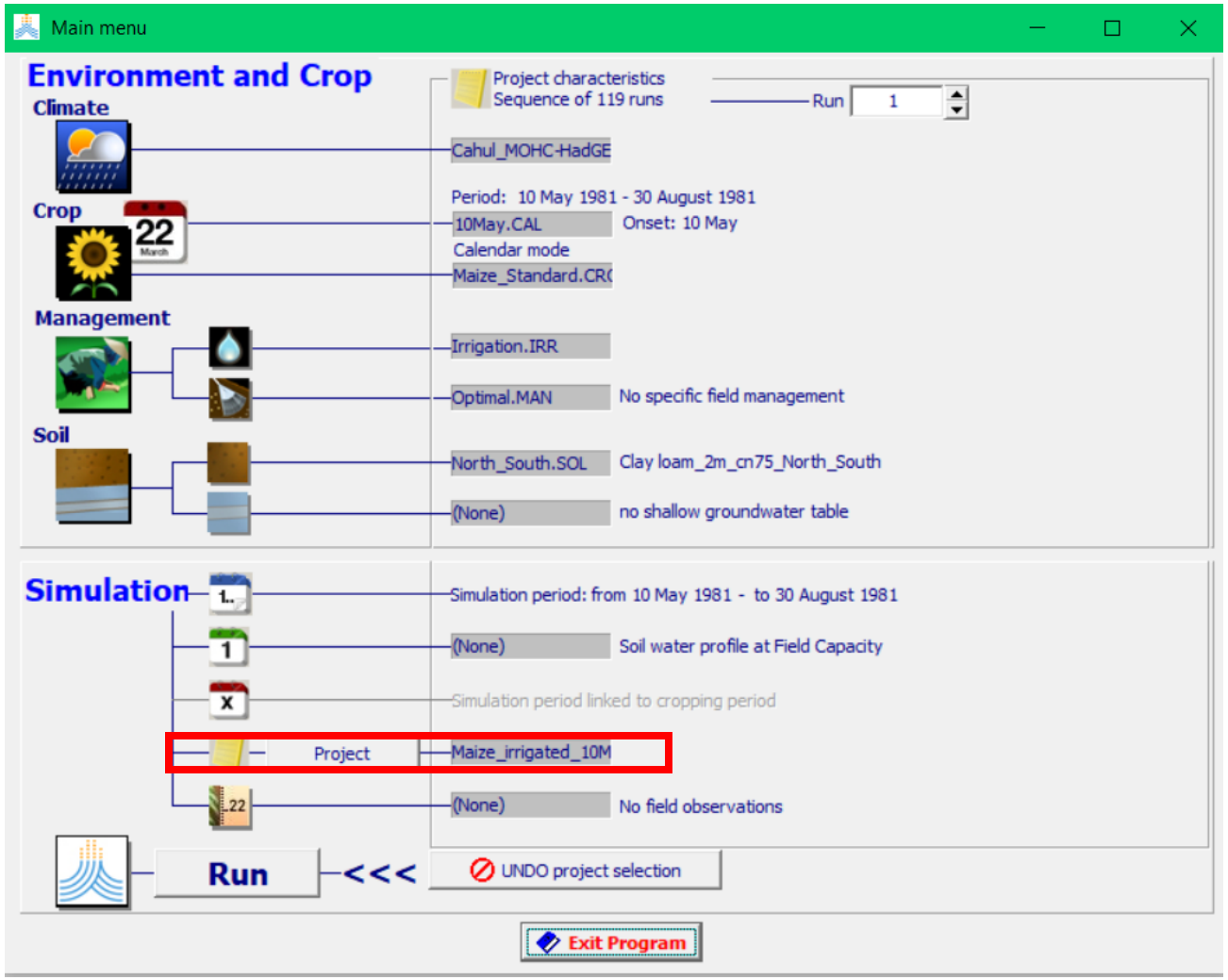
Maize_Irrigated_Cahul_10May_85_MOHC [X]

Maize_Rainfed_Cahul_10May_26_MOHC [ ] Step → Change the Irrigation file

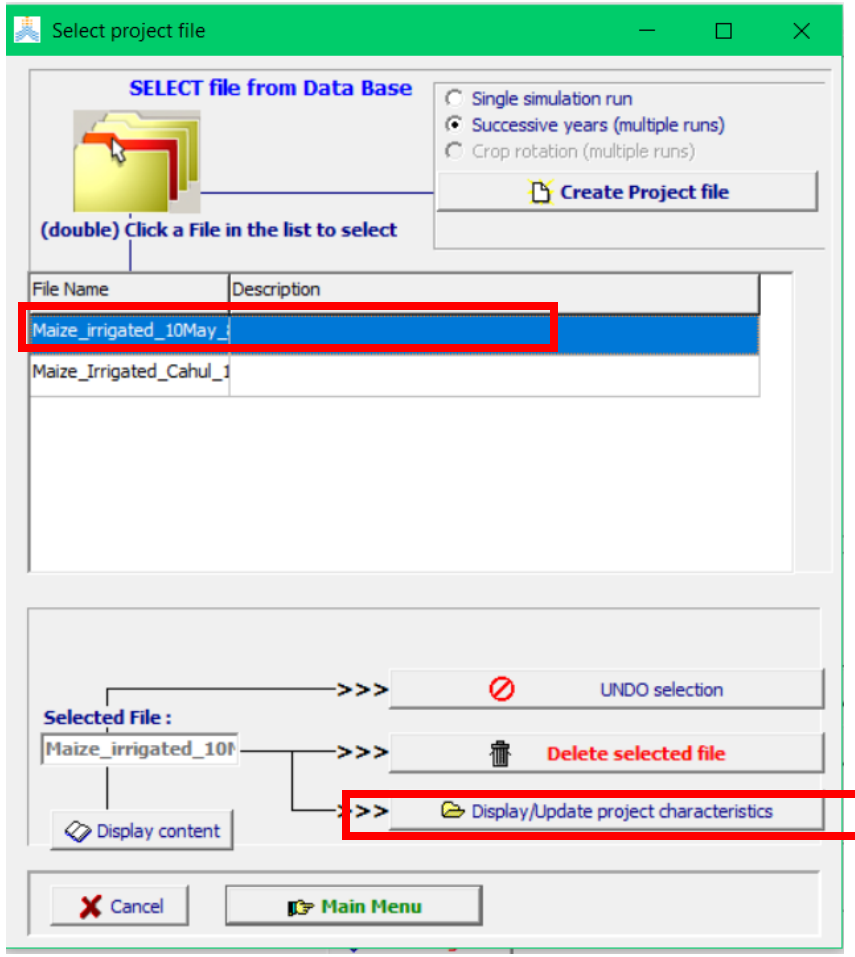
Maize_Rainfed_Cahul_10May_85_MOHC [ ] Step → Change the Irrigation file

Creation of rainfed PRM

Press “Project” button

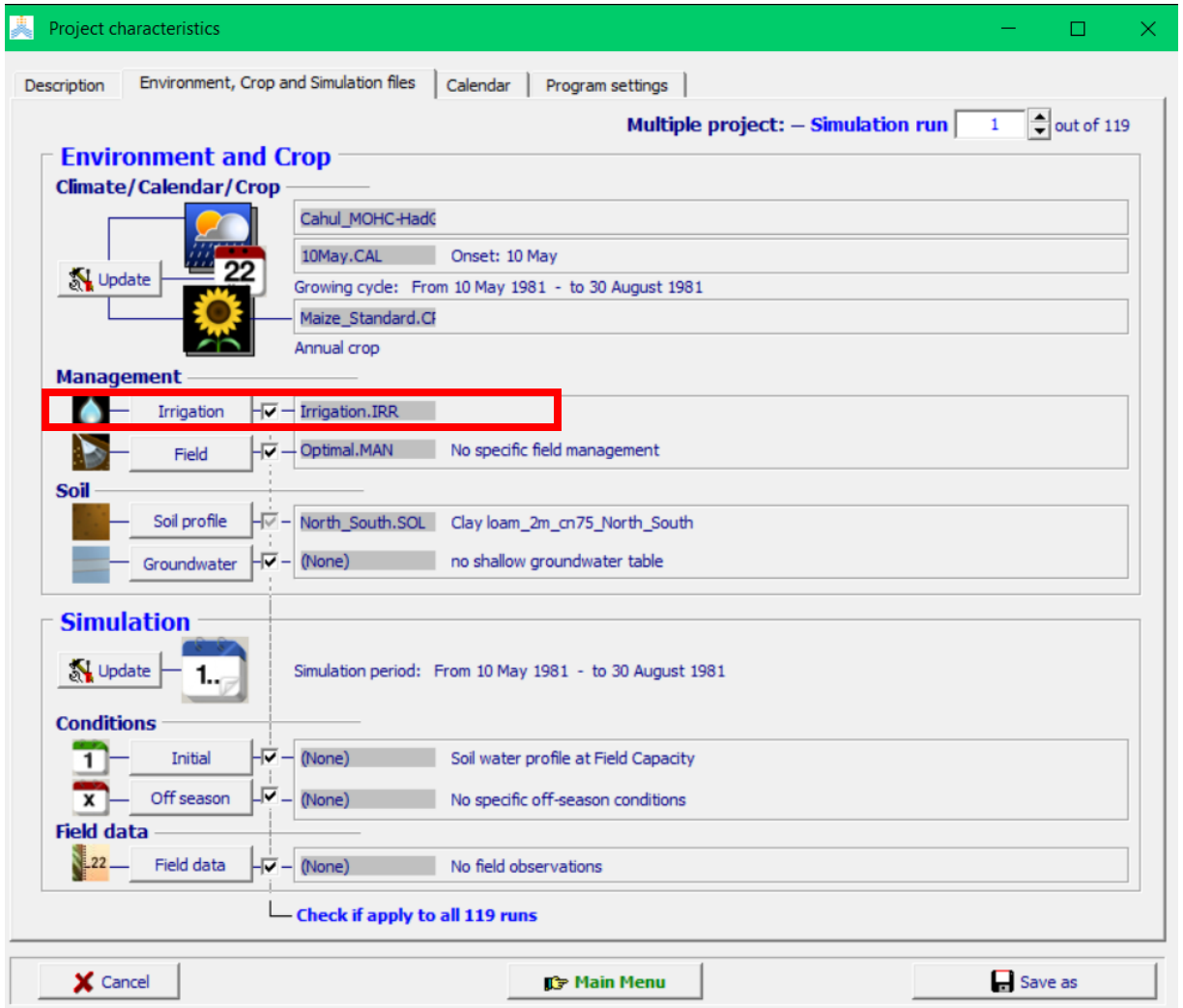


Select the first created file (RCP2.6)
Display/Update project characteristics

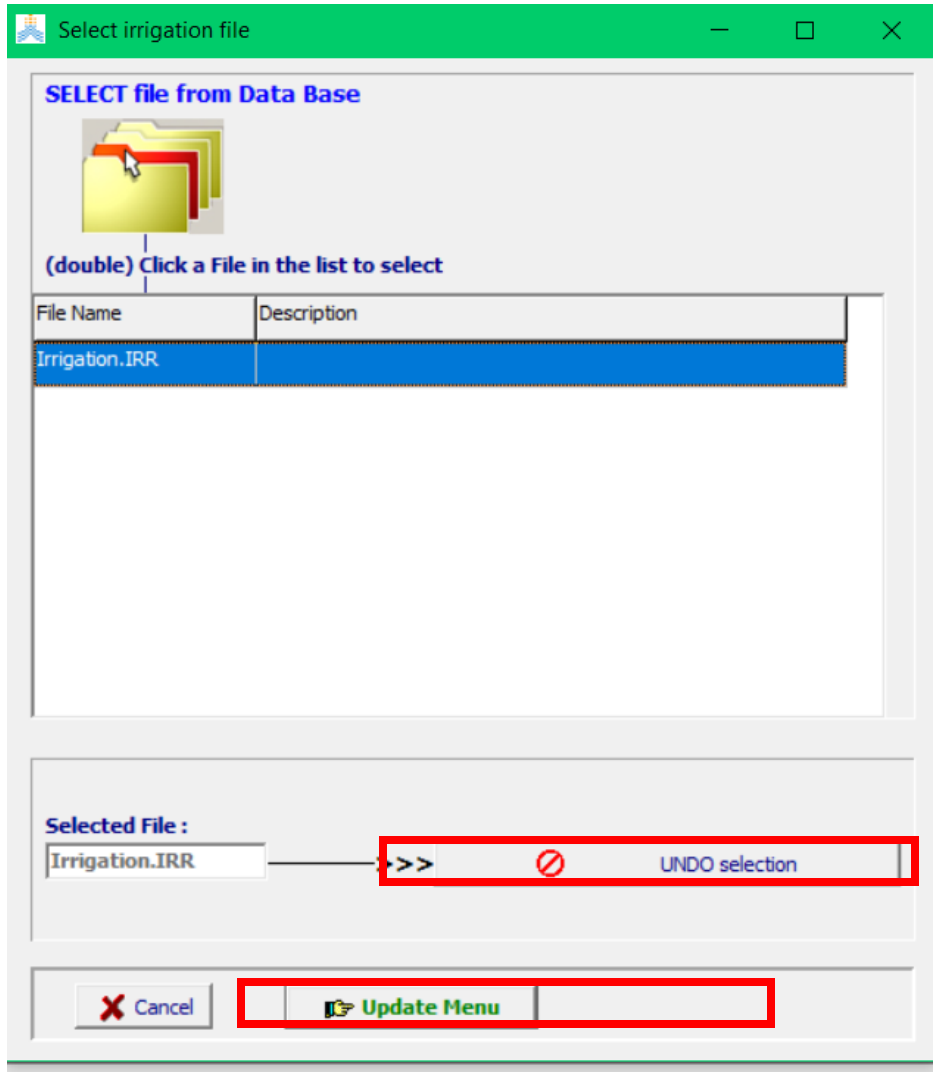


Creation of rainfed PRM

Press “Irrigation” button

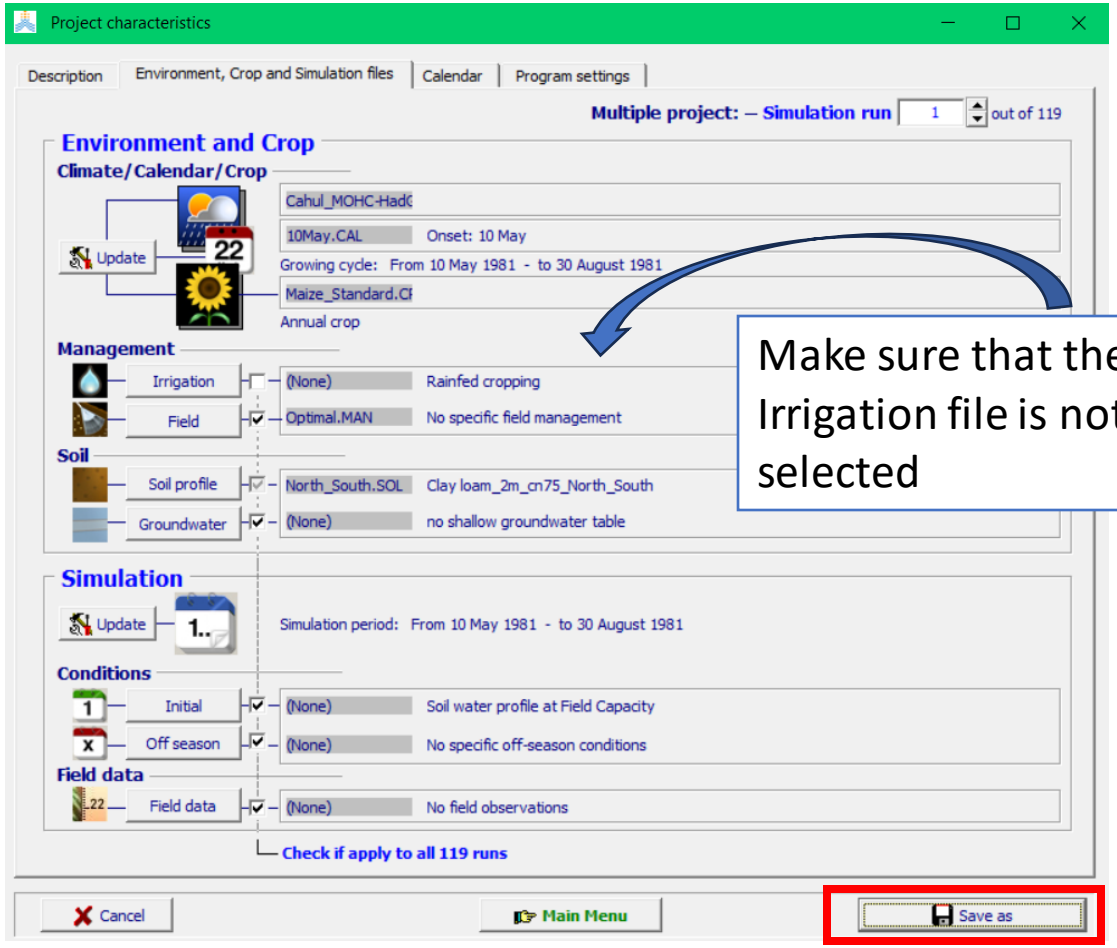


Click on UNDO selection
Update Menu



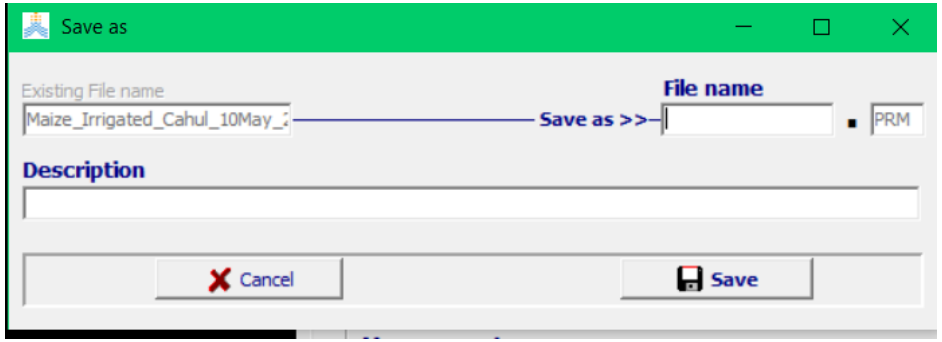
Creation of rainfed PRM

Press “Save as” button



Make sure that the Irrigation file is not selected

Rename the file as Maize_Rainfed_Cahul_10May_26_MOHC



Creation of new project files (.PRM)

Variables scheme

Repeat the operation with the file RCP8.5

Maize_Irrigated_Cahul_10May_26_MOHC [X]

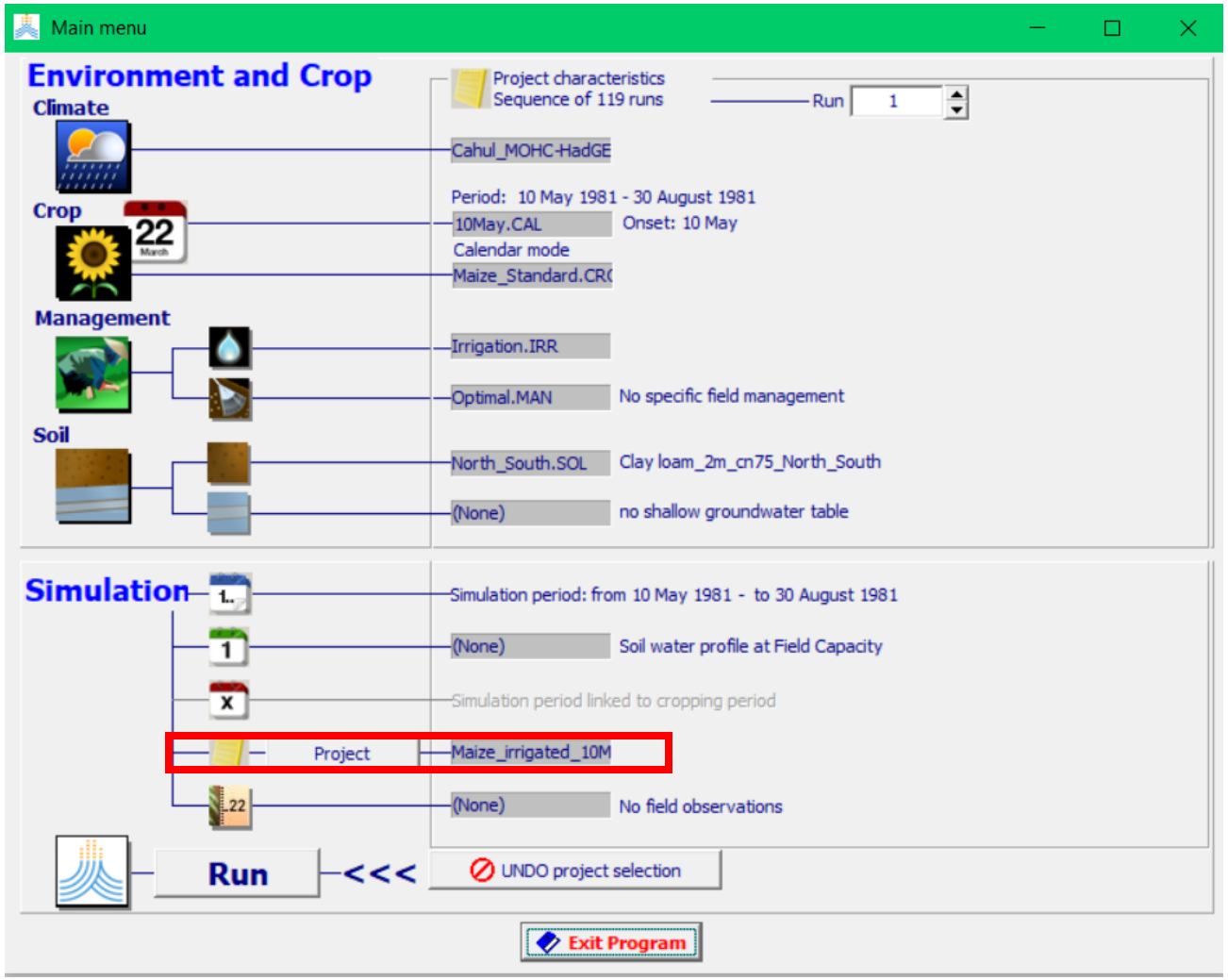
Maize_Irrigated_Cahul_10May_85_MOHC [X]

Maize_Rainfed_Cahul_10May_26_MOHC [X]

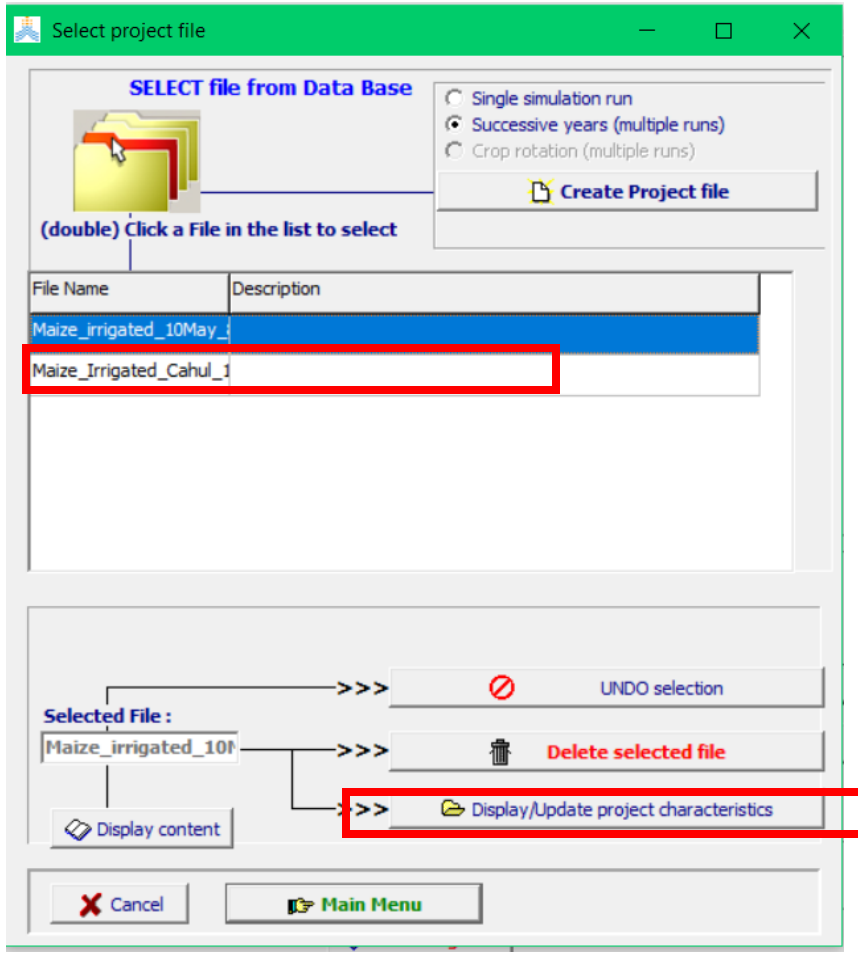
Maize_Rainfed_Cahul_10May_85_MOHC [ ] → Step → Change the irrigation file

Creation of rainfed PRM

Press “Project” button

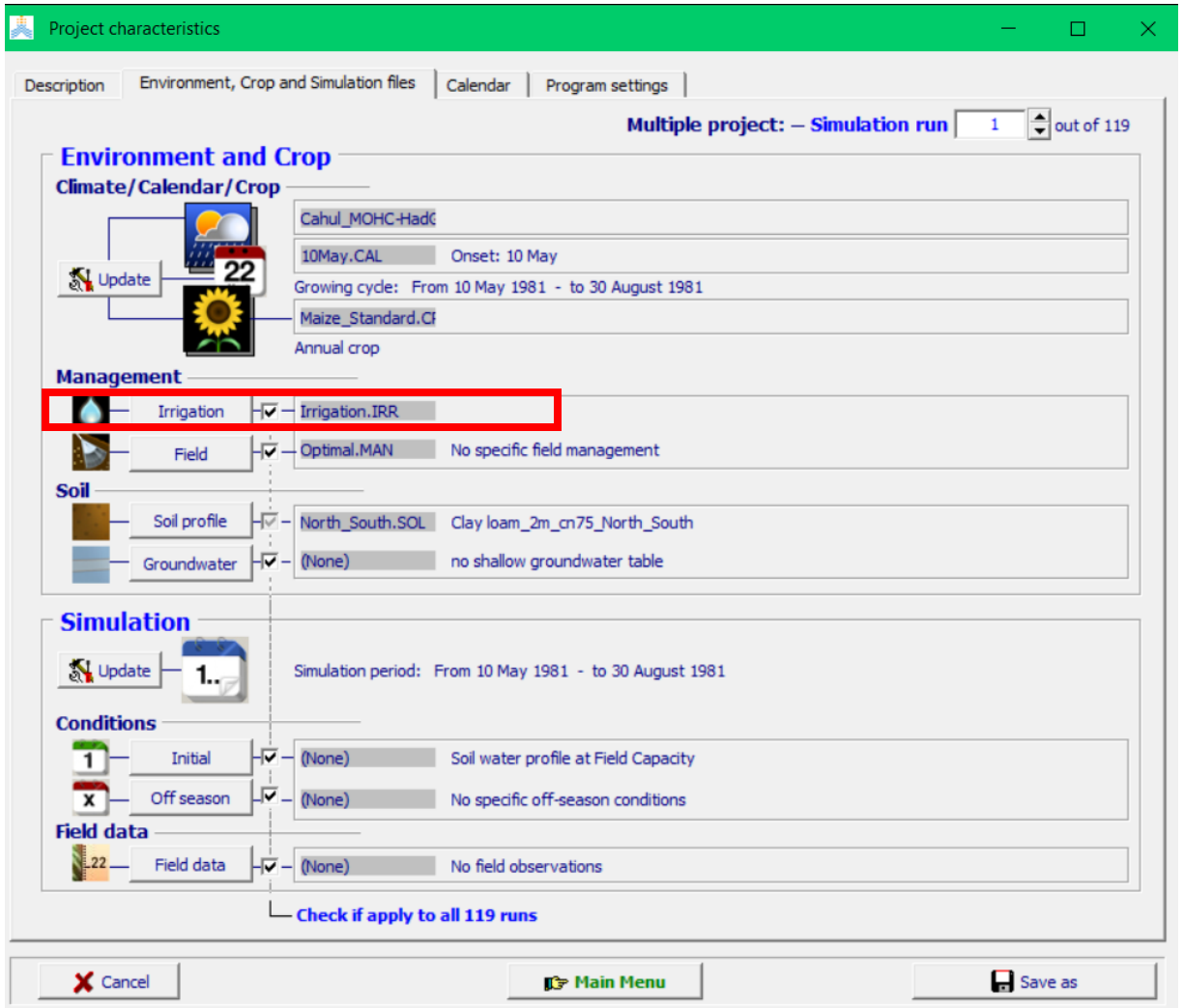


Select the second created file (RCP8.5)
Display/Update project characteristics

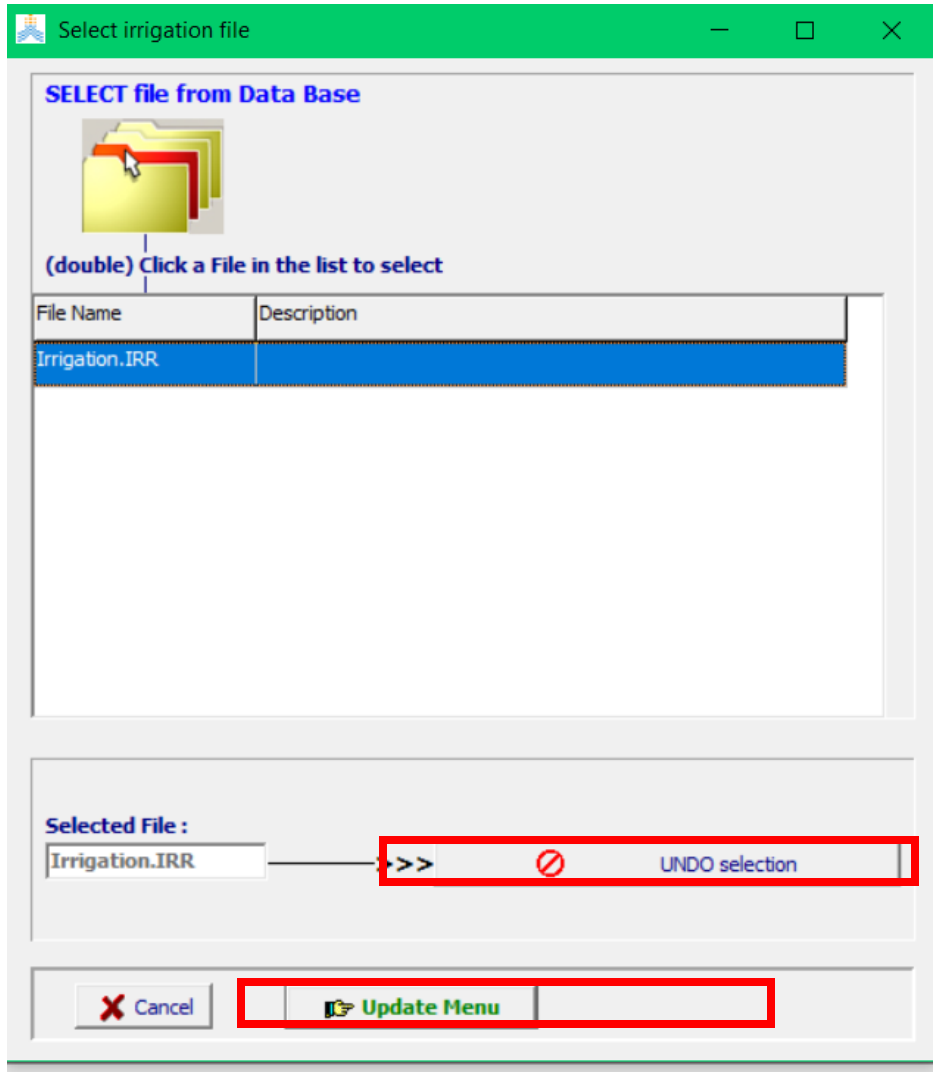


Creation of rainfed PRM

Press “Irrigation” button

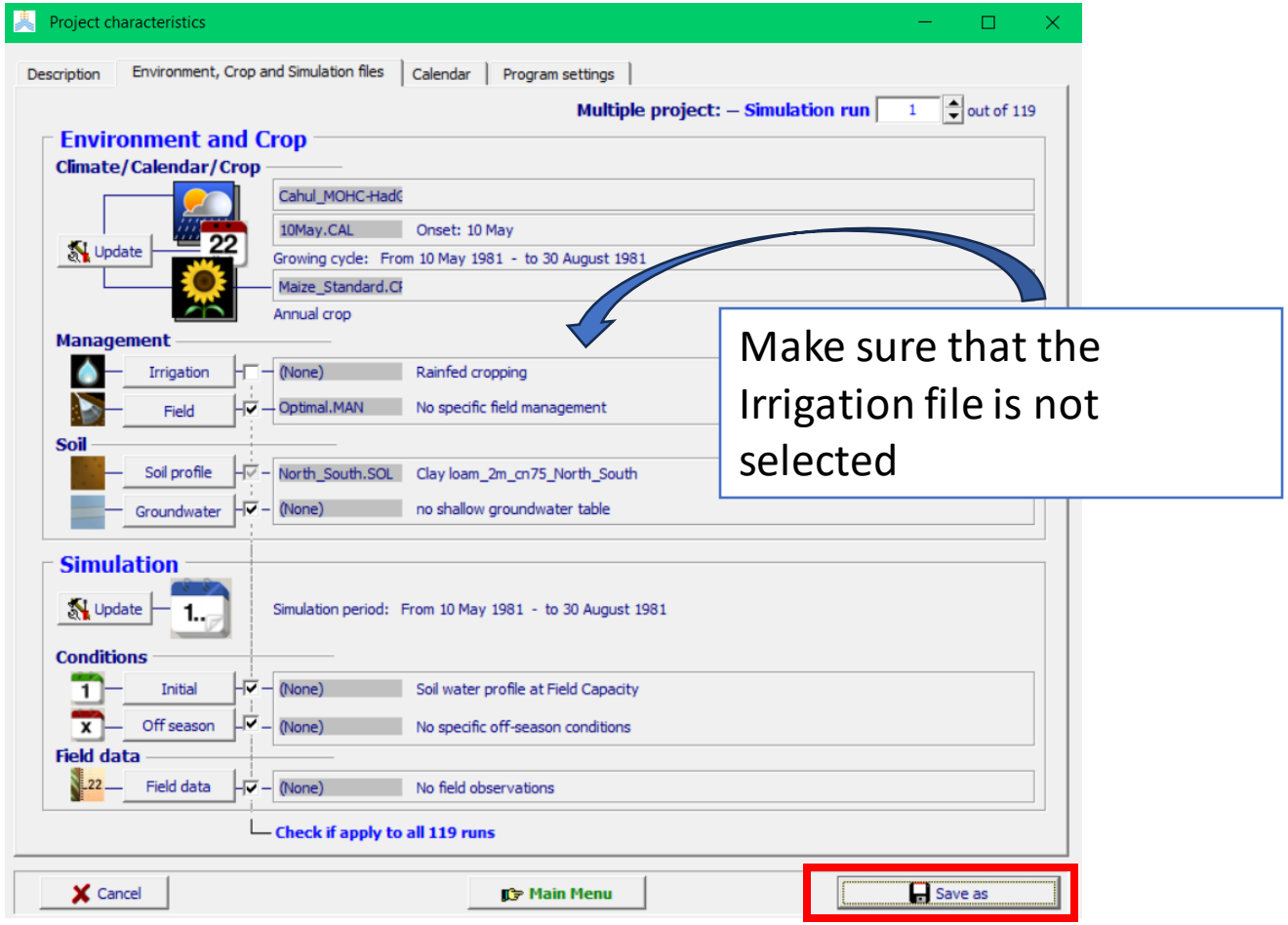


Click on UNDO selection
Update Menu



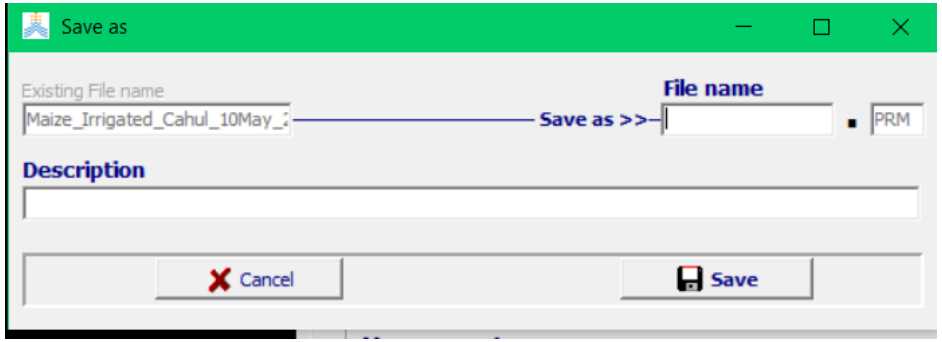
Creation of rainfed PRM

Press “Save as” button



Make sure that the Irrigation file is not selected

Rename the file as Maize_Rainfed_Cahul_10May_85_MOHC



Creation of new project files (.PRM)

Variables scheme

Repeat the operation with the file RCP8.5

Maize_Irrigated_Cahul_10May_26_MOHC	X
Maize_Irrigated_Cahul_10May_85_MOHC	X
Maize_Rainfed_Cahul_10May_26_MOHC	X
Maize_Rainfed_Cahul_10May_85_MOHC	X

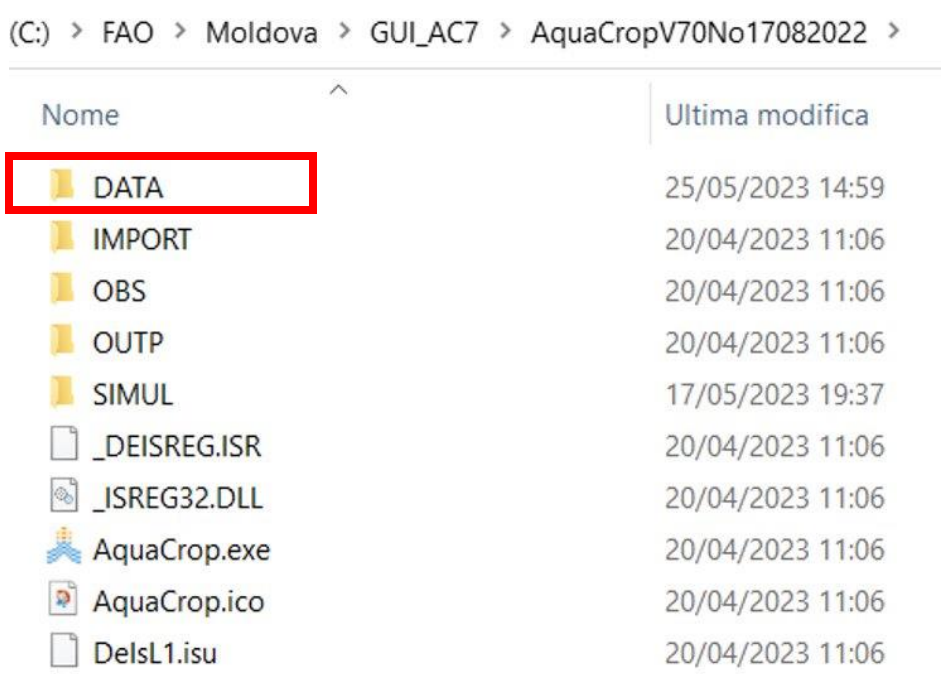
Food and Agriculture Organization of the United Nations

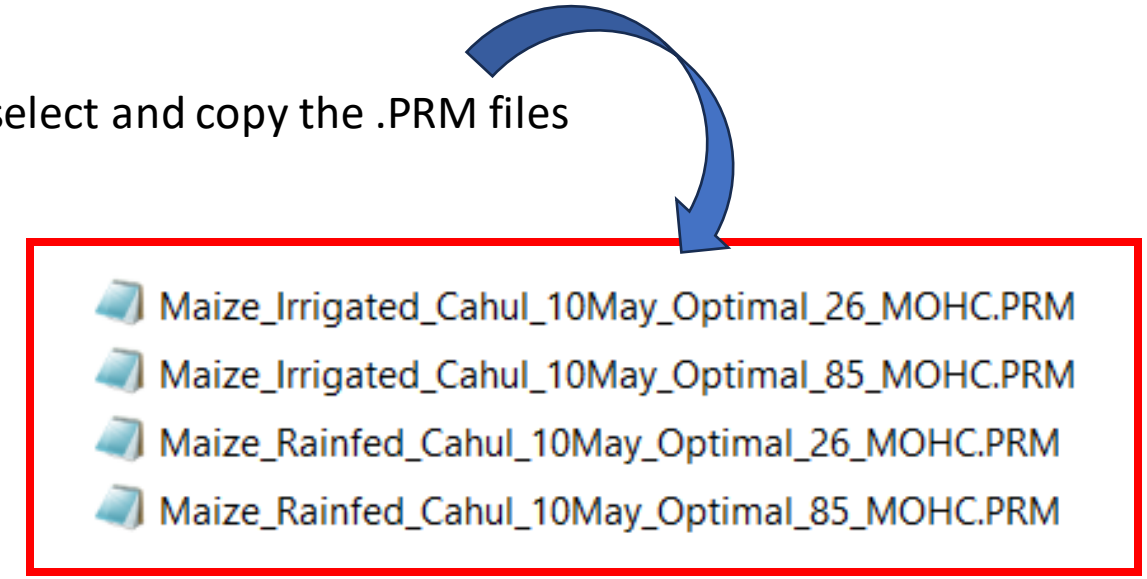
AquaCrop Plugin

June 30, 2023

Plug-in data

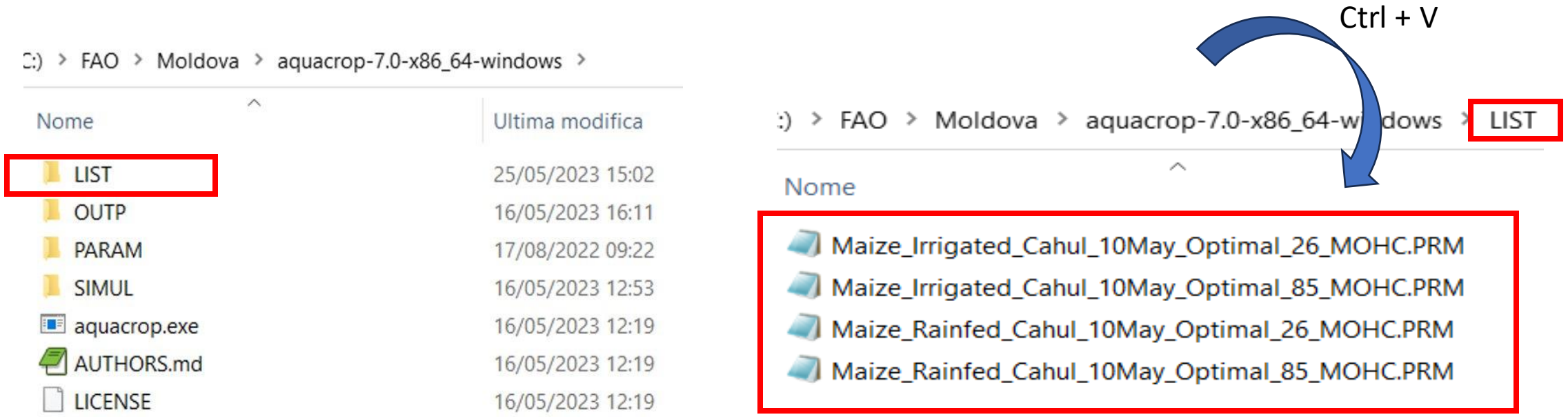
- Go to the DATA folder of "AquaCrop standard" - select and copy the .PRM files





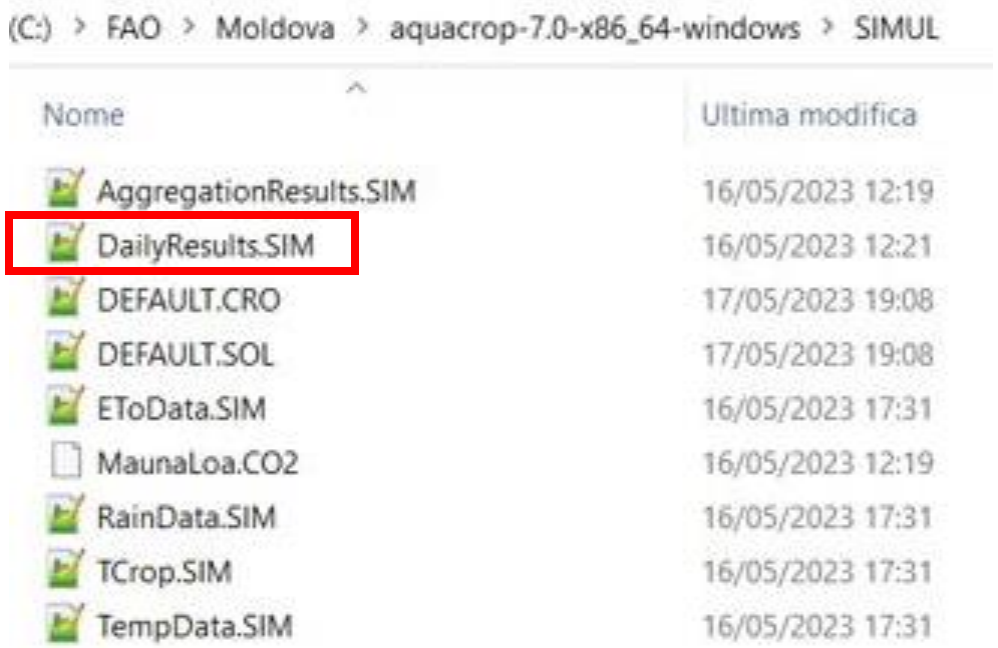
Plug-in data

- Paste the .PRM files into the LIST folder of the Plug-in



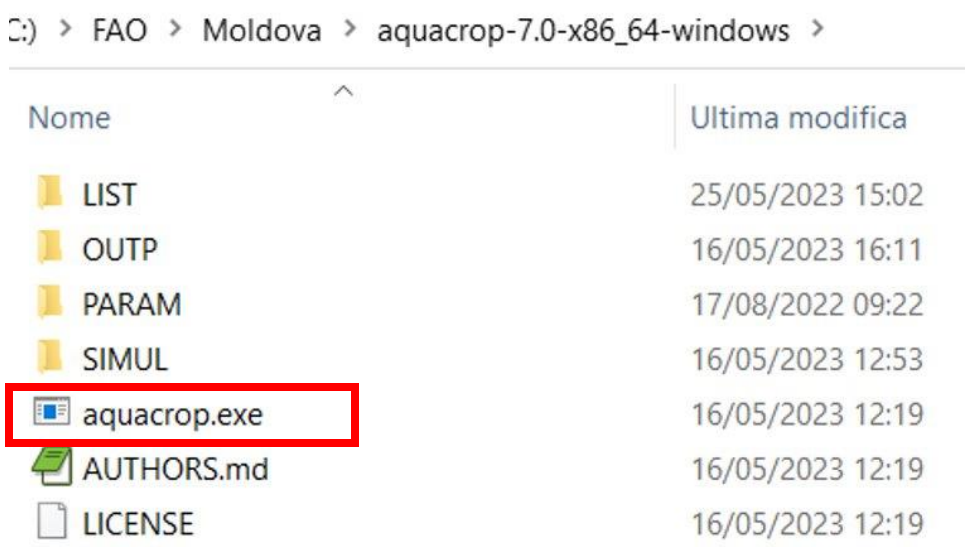
Plug-in

- *To run the plugin the text file DailyResults.SIM is needed to be in the “SIMUL” folder of the plugin. You can find it Here



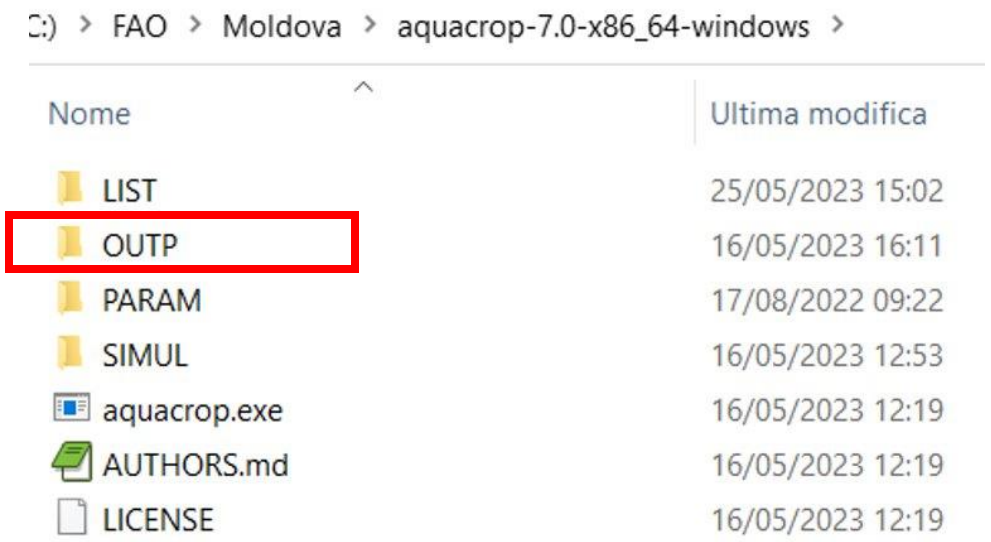
Plug-in

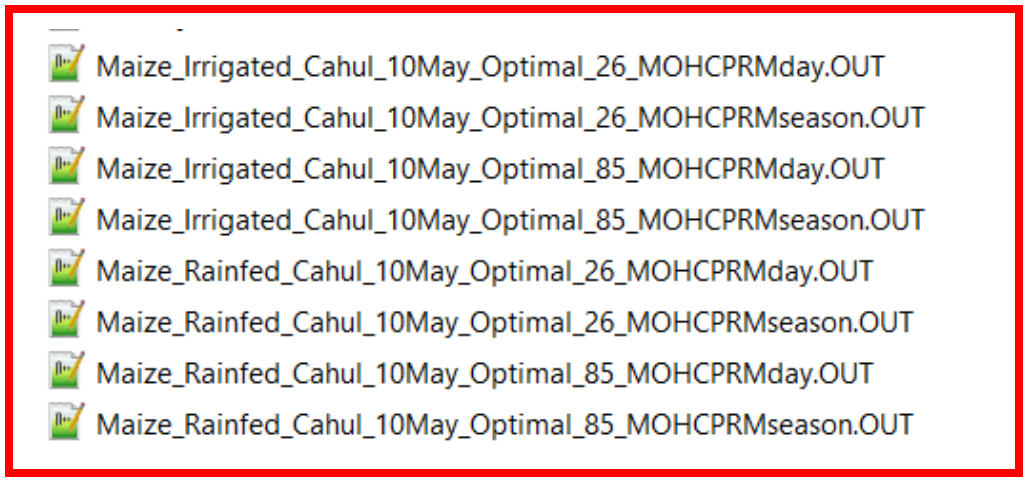
- Run the plug-in by double-clicking on aquacrop.exe (for 4 project files it will take approximately 3 minutes)



Plug-in

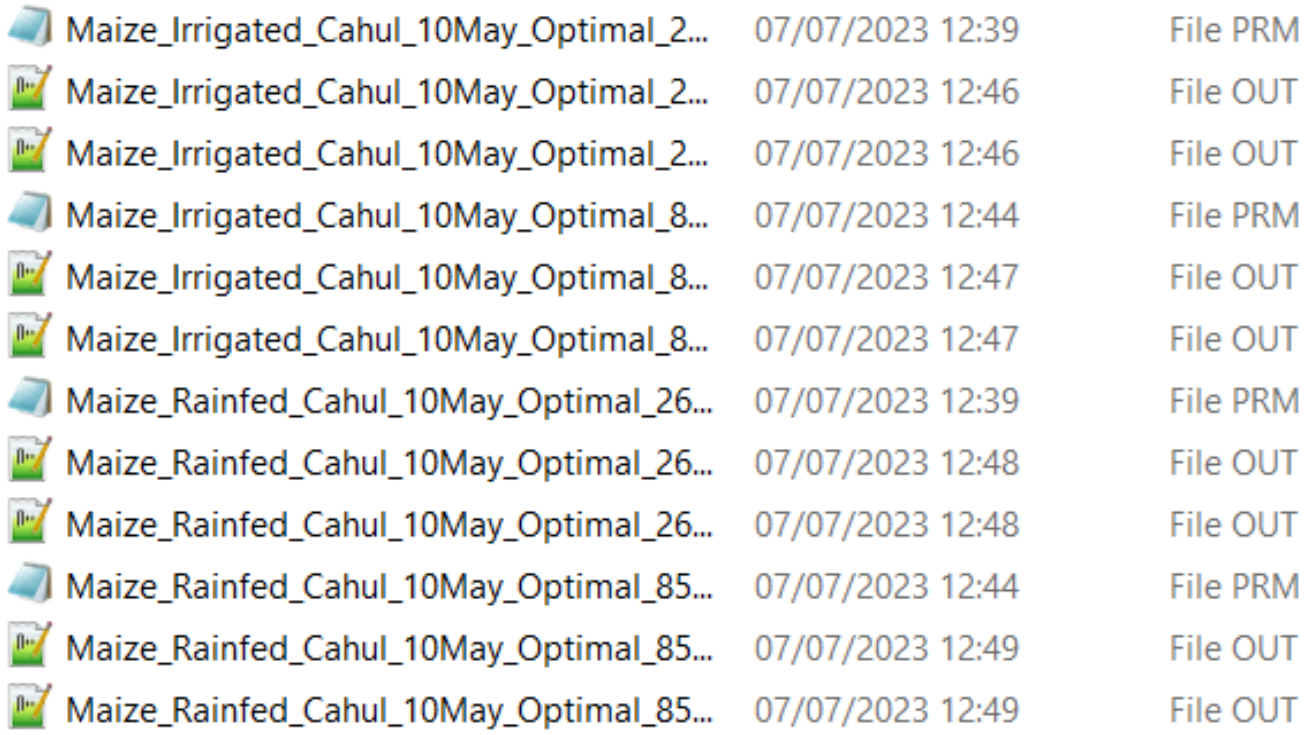
- After the plug-in worked, you will find the .OUT files (daily and seasonal) in the OUTP folder





Plug-in

Create a new folder and copy and paste the PRMs and OUTs data.



Here you can also find the the PRMs and OUTs files ready to be uploaded on AquaCrop Plotter.

Here is the link to the AquaCrop plotter platform.

Thank you!

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