



# LandSFACTS v2.0 - TUTORIAL

## Landscape Scale Functional Allocation of Crops Temporally and Spatially

Software development phases:

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# LandSFACTS v2.0 Tutorial

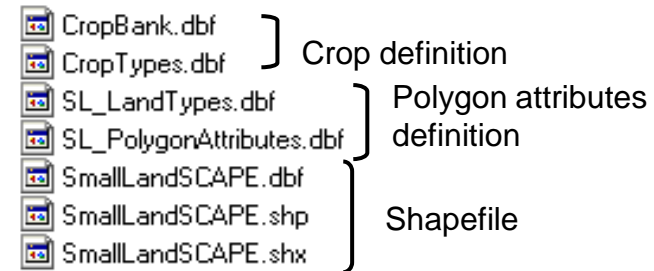
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# 1. User tips

This tutorial only aims at providing a quick practical overview of the main functions of the software. For further information please refer to the Help file.

- Tutorial data inputs are in the “Tutorial\_DataInputs” folder
- An example of the completed tutorial project is in “Tutorial\_FullProject” folder



## General tips:

- Project folder: holds all information relating to a project. Inputs data are organised & stored within the project database.  landscapesim.db
- The availability of menus and options are dependent upon the information held within the database.
- Completed options are identifiable by their green tick. 
- Most windows are expendable by dragging the corners.
- Tables to import are in DBF IV format
- PlgID refers to polygon ID, and CID to final crop ID
- Help file (*v2.0 in progress...*)

## 2. Install Software

### a. Install software:

- Unzip



- Place the shortcut on the desktop



- Move the shortcut to the desktop

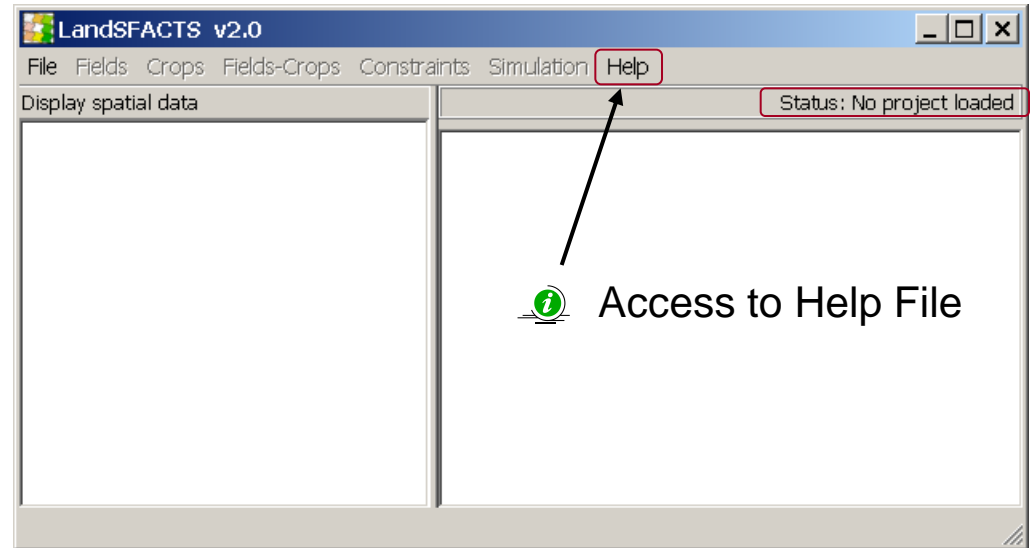


### 3. Open Software

- a. Open software, by double-clicking shortcut



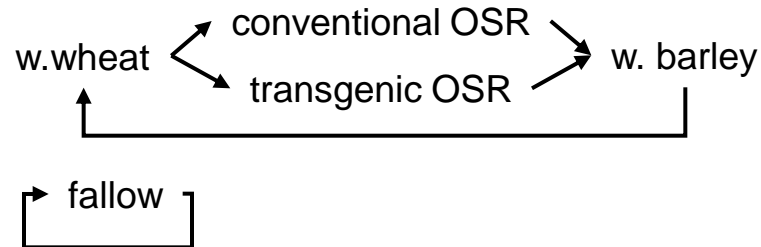
- b. LandSFACTS main interface is displayed



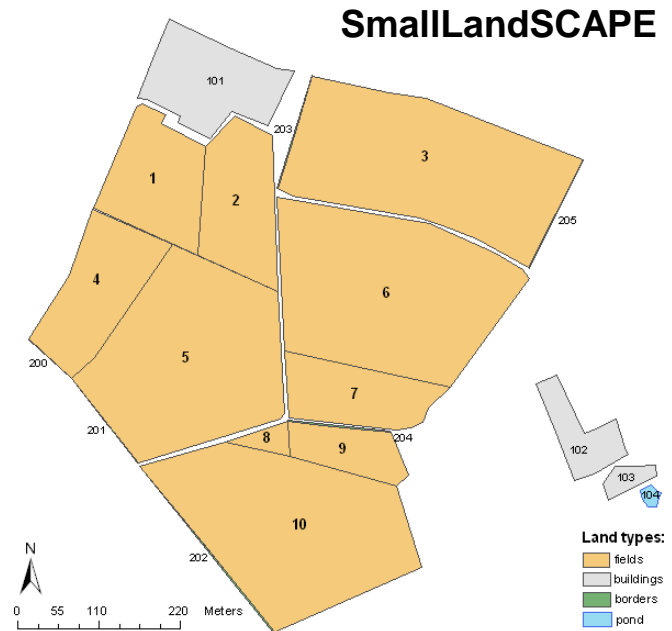
## 4. Tutorial project overview

The tutorial guides through the steps required to set up the following simplified scenario on **GM-conventional oilseed rape coexistence**.

- Create project
- Define the fields
  - 10 fields, 3 buildings, 1 pond, 6 borders
- Define the crops and rotations
  - 2 crop rotations



- Assign a rotation per field, and identify the initial crops by default
- Set up the constraints to simulate
  - separation distance of 100m between conv. OSR and GM OSR
  - 3 temporal constraints (GM only grown from year 3 to 5)
  - Yearly crop proportion – OSR 30%



- Set up the behaviour of the model & Run the simulation

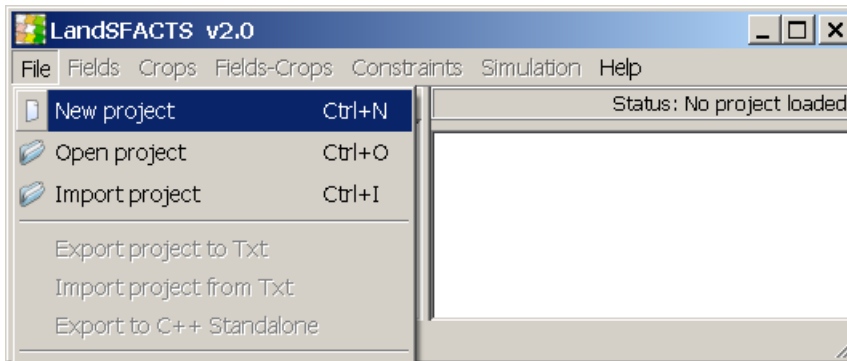
*n.b. Tutorial data inputs are in the "Tutorial\_DataInputs" folder*



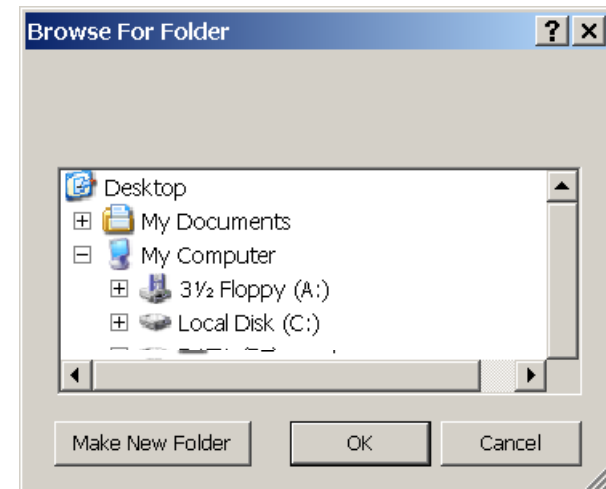
# 5. Create project 6. Fields 7. Crops 8. Fields-Crops 9. Constraints 10. Simulation

## 1. New project

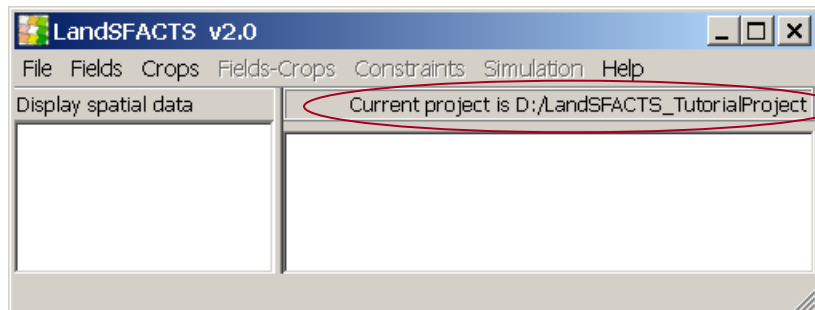
a. Select File / "New project"




b. Create new folder to hold simulation data



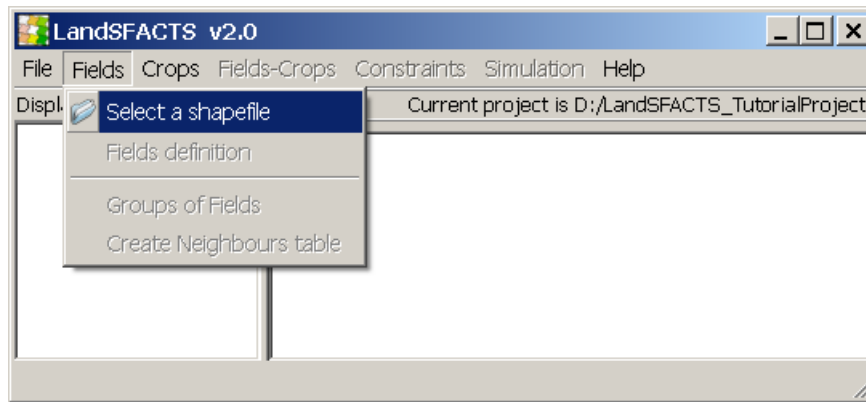
c. The project folder is displayed



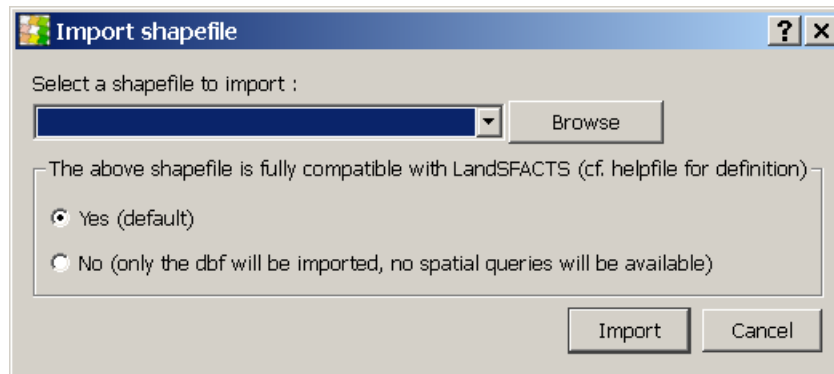
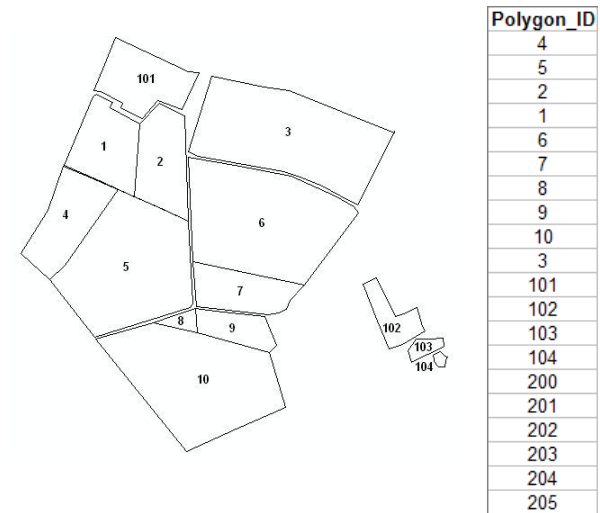
→ When a project folder is selected, a blank database of the new project is created within the folder.  landscapesim.db

The project folder will hold all information relating to the project.

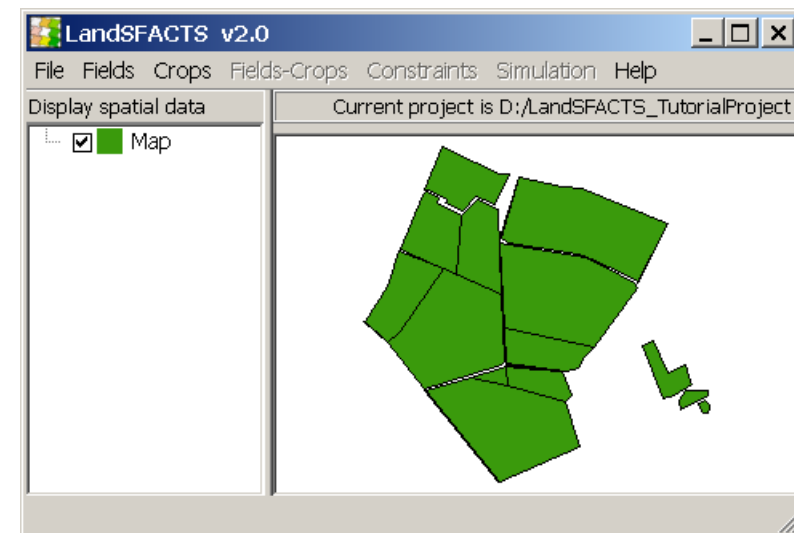
a. Select shapefile: SmallLandSCAPE.shp  
(from Tutorial\_DataInputs)



SmallLandSCAPE.dbf



b. The shapefile is automatically copied into the project folder, and then displayed





# 5. Create project 6. Fields 7. Crops 8. Fields-Crops 9. Constraints 10. Simulation

## 2. Fields definition (1/4)

### 2 steps process:

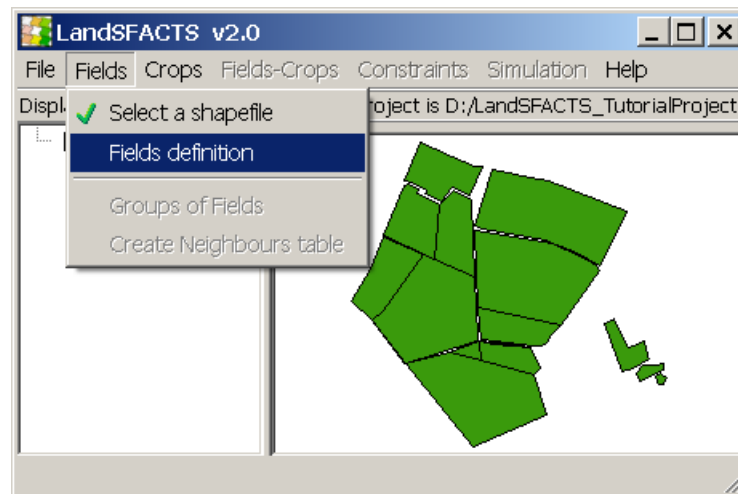
- link to every polygon a landtype ID  
→ import polygon attributes table (PlgID, LandTypeID)
- provide a name/definition for each landtype ID  
→ import land type table (LandTypeID, name/definition)

PLGID	LANDTYPEID
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1

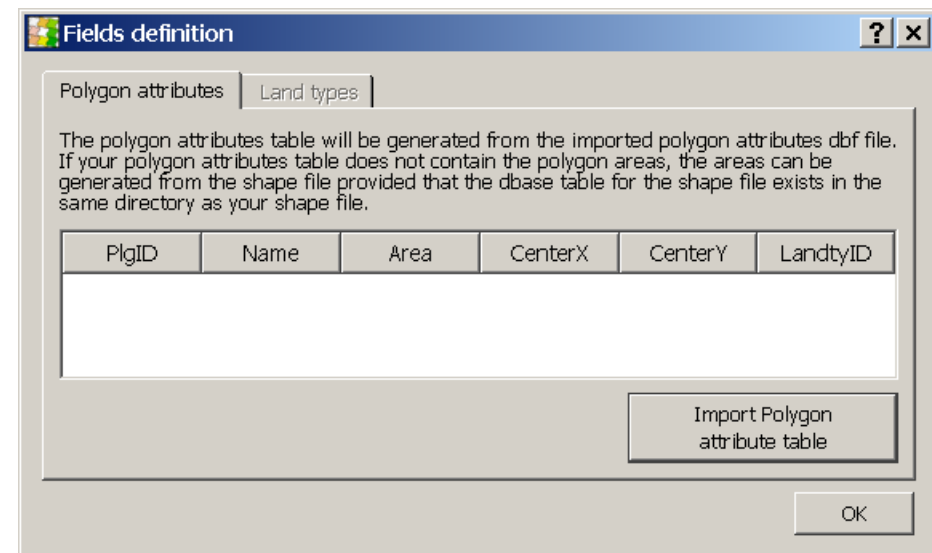
101	2
102	2
103	2
104	3
200	4
201	4
202	4
203	4
204	4
205	4

LANDTYPEID	DEFINITION
1	fields
2	buildings
3	pond
4	Borders

### a. Select polygon attributes



### b. Import "SL\_PolygonAttributes.dbf"



# 5. Create project 6. Fields 7. Crops 8. Fields-Crops 9. Constraints 10. Simulation

## 2. Fields definition (2/4)


c. Select the correct column names  
( PolygonID = PLGID,  
LandTypeID = LANDTYPEID )  
& click on import.

The polygonAttributes table will be generated from the imported polygonAttributes dbf file.  
Select polygon attribute dbf file:  
ple\_data\_V2-0/LandSCAPES/SmallLandSCAPE/SL\_PolygonAttributes.dbf [Browse...]

PolygonID: PLGID  
LandTypeID: LANDTYPEID  
Name:   
Area(\*):   
Centroid X(\*):   
Centroid Y(\*):

(\*) If unavailable, the information will be automatically determined.

[Import] [Cancel]

 The areas and centroids are automatically calculated.

d. The polygon attributes table is displayed

PlgID	Name	Area	CenterX	CenterY	LandtyID
1		18843	511920	213536	1
2		19428	512032	213506	1
3		58776.2	512285	213557	1

e. The landtype table is now available,  
import Land Type: "SL\_LandTypes.dbf"

Fields definition

Polygon attributes Land types

LandtyID	Name	Def

[Import Landtypes table]

[OK]

# 5. Create project 6. Fields 7. Crops 8. Fields-Crops 9. Constraints 10. Simulation

## 2. Fields definition (3/4)

f. Select the correct columns of the table:

landtypeID = LANDTYPEID

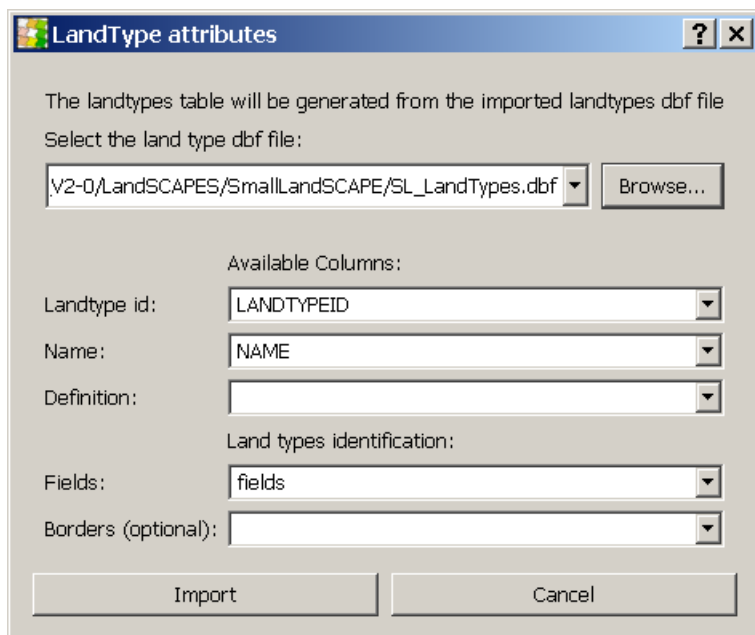
Name = NAME

From Name, select the right definitions:

**Fields = fields**

Borders = Borders (optional)

LANDTYPEID	NAME
1	fields
2	buildings
3	pond
4	Borders



The landtypes table will be generated from the imported landtypes dbf file

Select the land type dbf file:

Available Columns:

Landtype id:

Name:

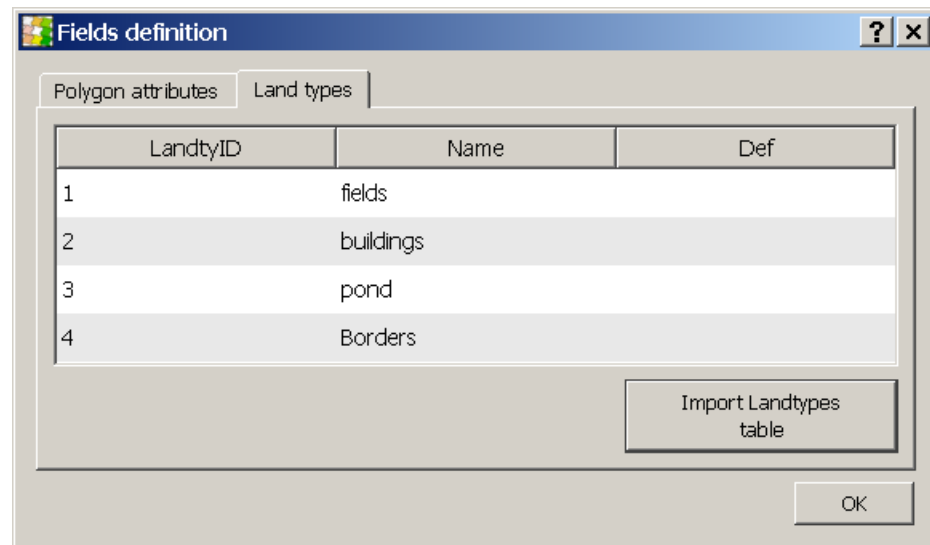
Definition:

Land types identification:

Fields:

Borders (optional):

g. Click on "Import" & the table is displayed.

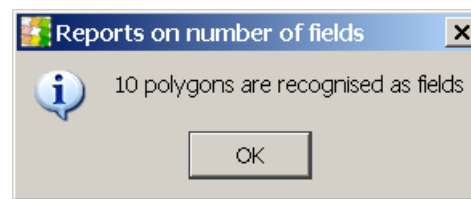


**Fields definition**


Polygon attributes | Land types

LandtyID	Name	Def
1	fields	
2	buildings	
3	pond	
4	Borders	

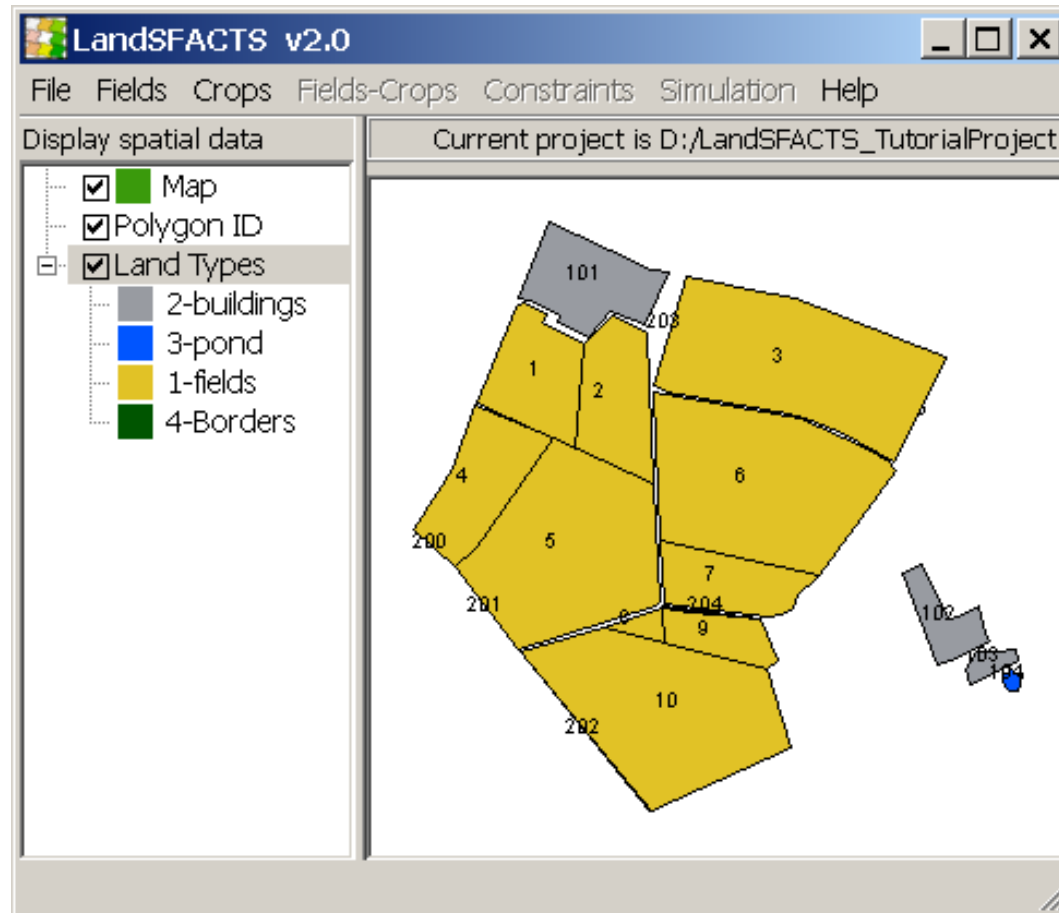
h. Indication on the number of polygons recognised as fields by the software.



**Reports on number of fields**

 10 polygons are recognised as fields

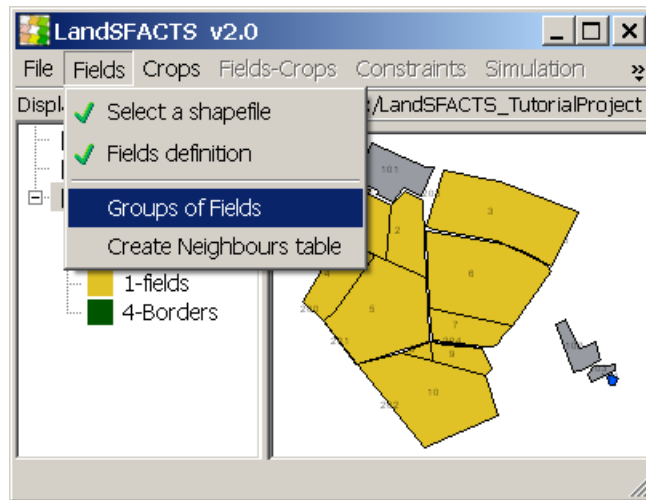
- i. The ID and land type of each polygons can now be displayed.  
(double click the colours on the left pan, to change them)



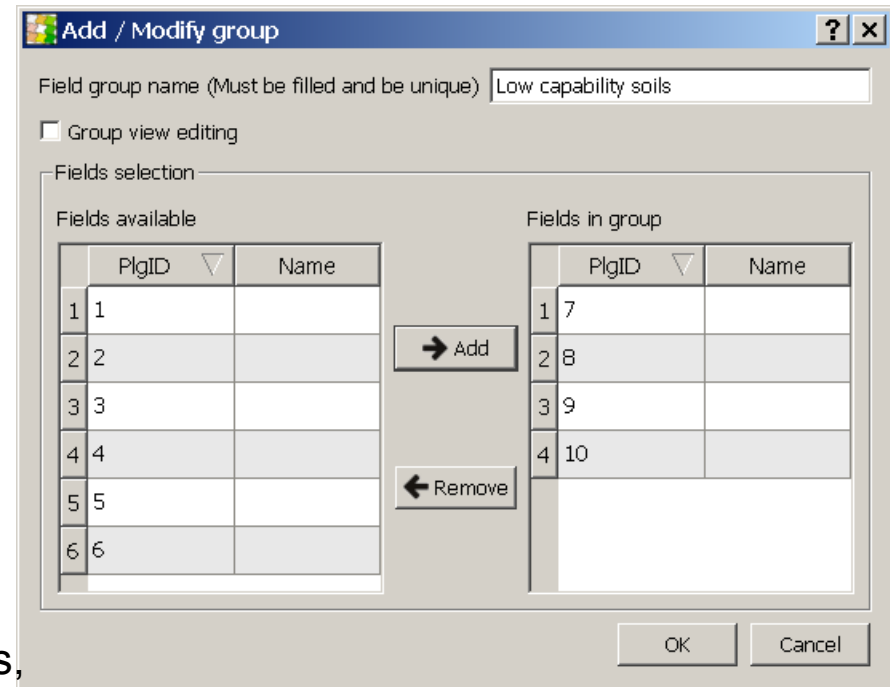
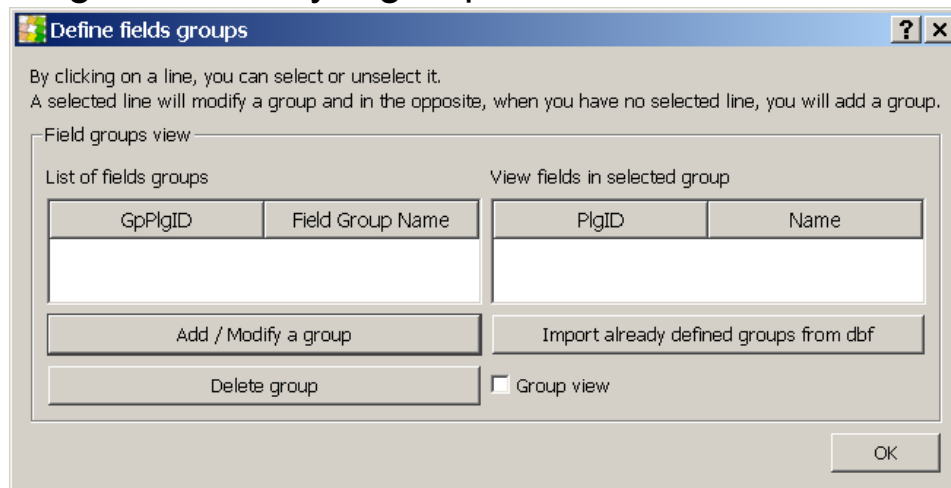
 The "Map" tick is an on-off button controlling the map display

# 5. Create project 6. Fields 7. Crops 8. Fields-Crops 9. Constraints 10. Simulation 3. Groups of fields (1/2)

## a. Select “groups of fields”



## b. “Groups of fields” is displayed, add 2 groups, Using “Add/Modify a group”

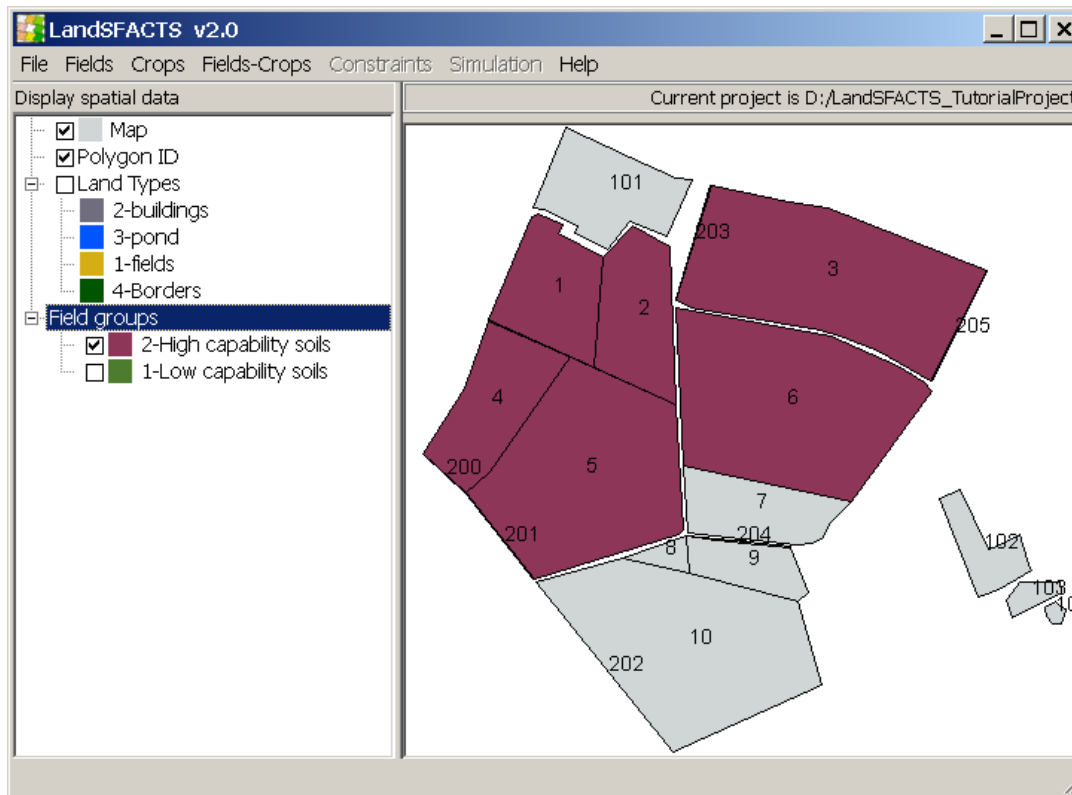


c. In the “Add/Modify group” interface,

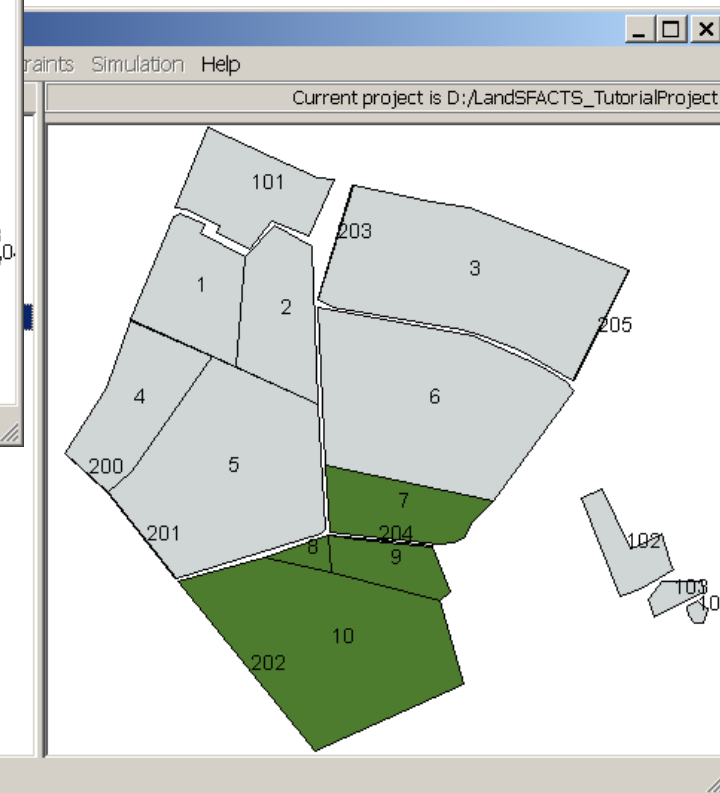
- Add group name (“low capability soils”)
- Select the wanted fields (7 to 10) and click on “Add” button arrow.

Do the same for the group “high capability soils”, with fields 1 to 6.

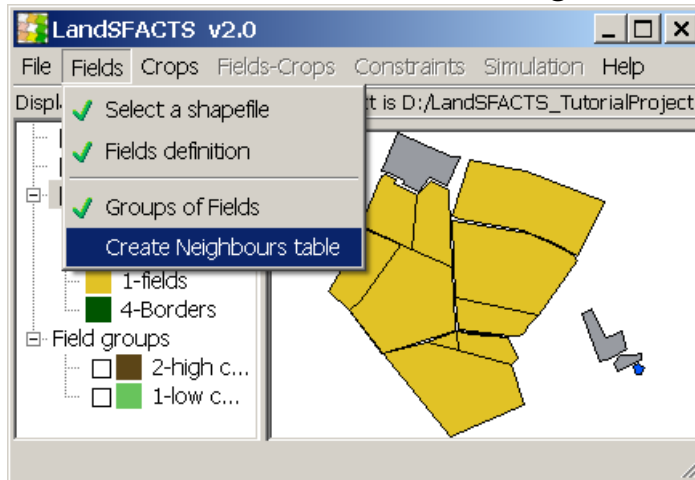
5. Create project 6. Fields 7. Crops 8. Fields-Crops 9. Constraints 10. Simulation  
3. Groups of fields (2/2)




d. Both groups can be displayed

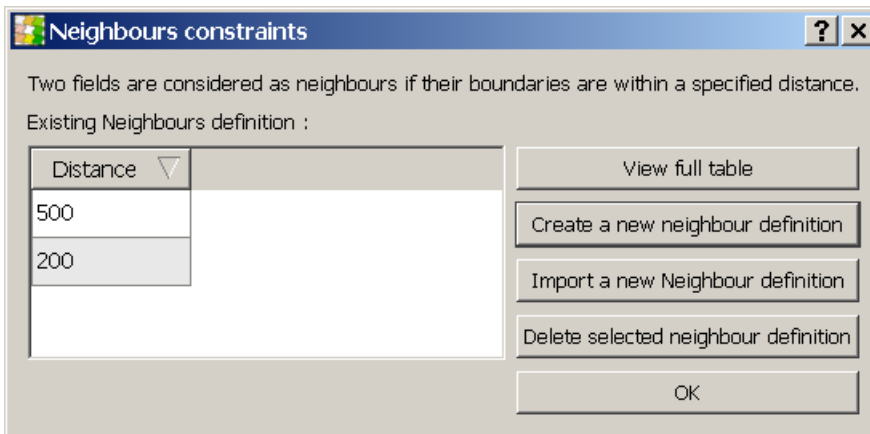



a. Select “Fields” / “Create Neighbours table”



 The neighbours tables are required for some Constraints (separation distances and connectivity)

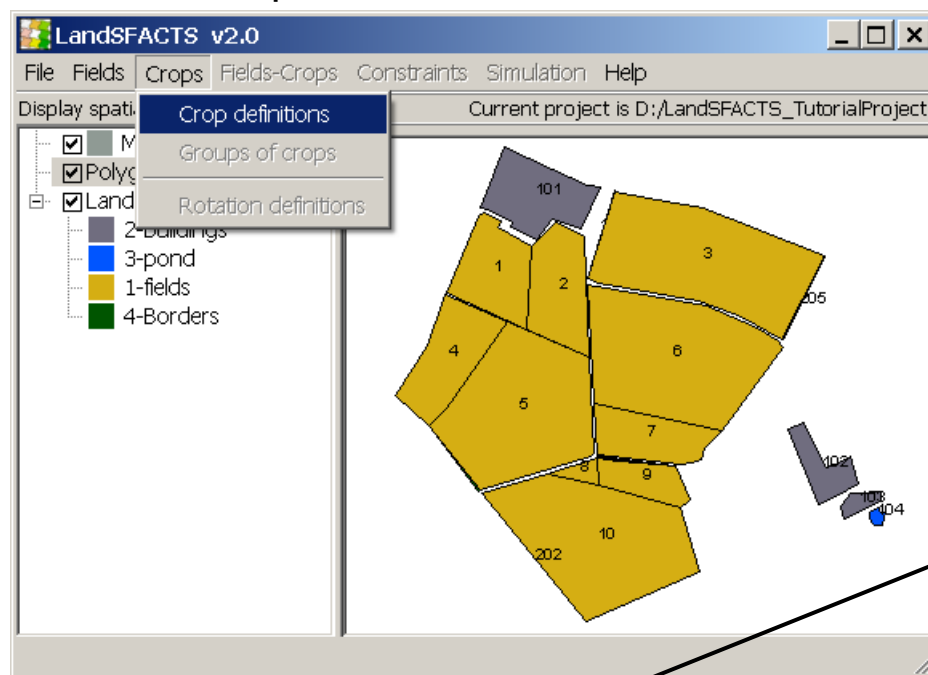
b. Click on “Create a new neighbour definition”, add two distances “200” & “500”m



 For each distance specified, the software creates a table of all the fields which are neighbours (i.e. their boundaries are within the distances.) This table can be viewed by clicking on “View full table”.

## a. Select crop definition

 Crop definition is made up of three tables:



**Final crops:** defines the individual crops to model (CID).

CID	CBankID	CTypeID
1	1	7
2	2	3
3	2	2
4	4	7
...	...	...

**Crop type:** groups of crops as defined by Genesys model

CBankID	CAPcode	Cname	Def
1	BE6	Beans	blabla
2	CO1	OSR	blabla
3		vegetables	blabla

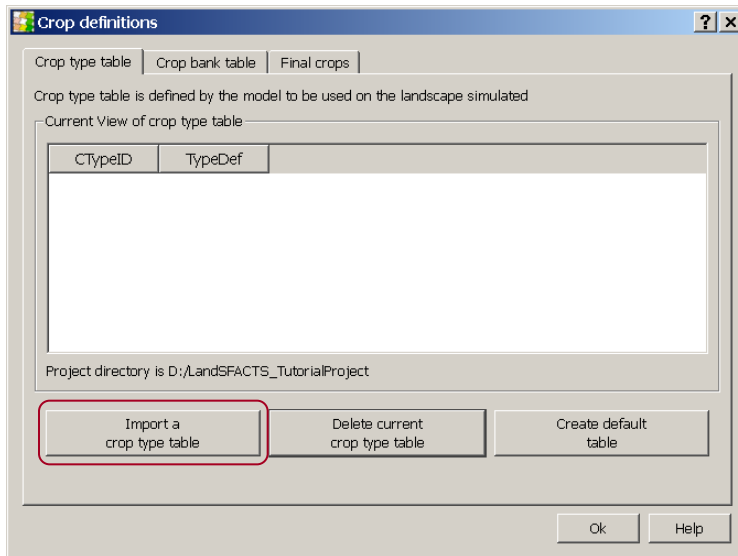
**Crop bank:** list the crops.  
This table may be imported from a CAP code table (EU codes for CAP declarations).

CTypeID	TypeDef
1	Border
2	Hybrid OSR
3	Transgenic OSR
4	Conventional OSR
5	Winter crop
6	Spring crop
7	Autumn-sown set-aside
8	Spring-sown set-aside
9	Unsown set-aside
10	Permanent set-aside

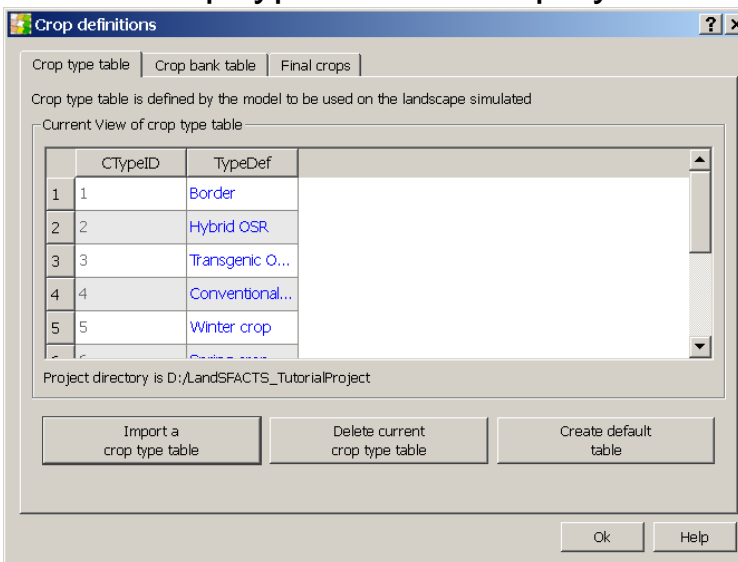


# 5. Create project 6. Fields 7. Crops 8. Fields-Crops 9. Constraints 10. Simulation 1. Crop definition (2/3)

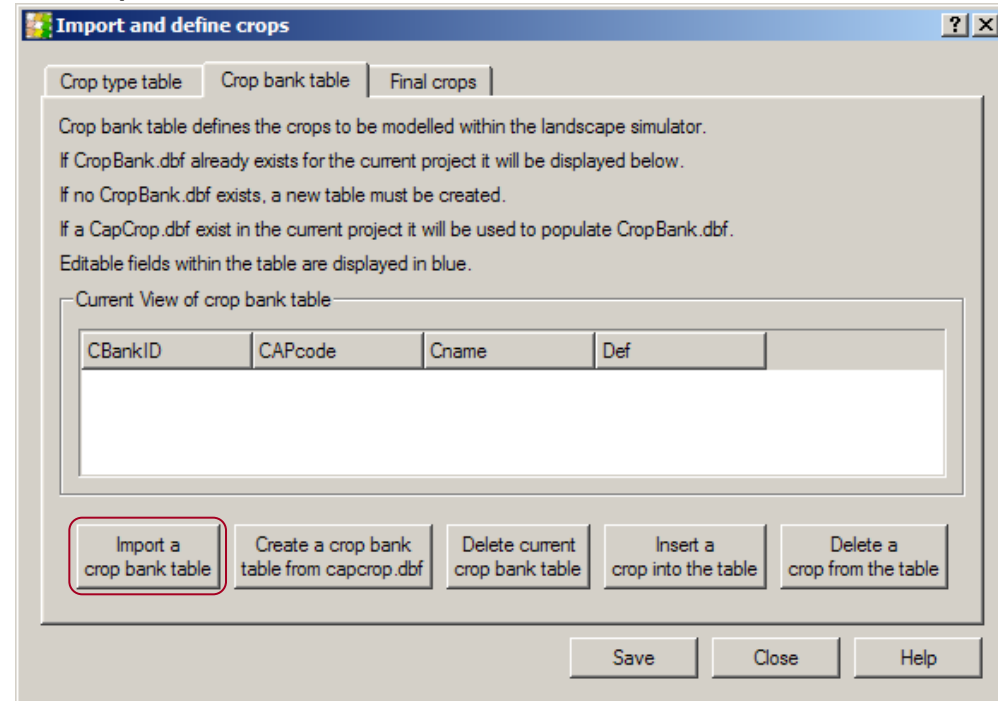
## b. Import "CropTypes\_OSRgm.dbf"



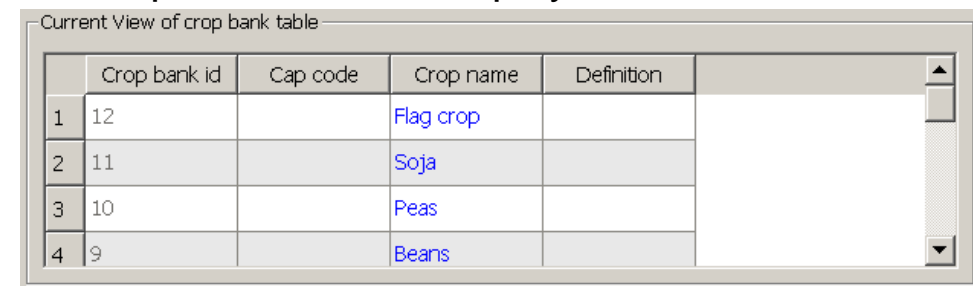
## c. The crop type table is displayed



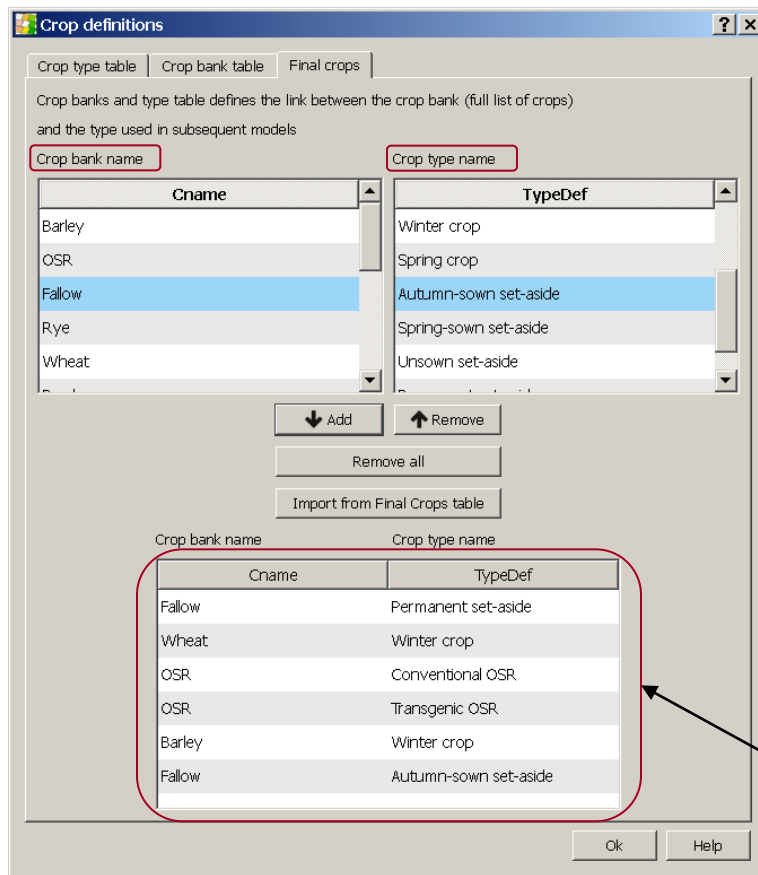
## d. Next tab, "Import a crop bank table" called "CropBank.dbf"



## e. Crop bank table is display




## f. Next tab: Final crops



## h. Final Crop table

Cname	TypeDef
Fallow	Permanent set-aside
Wheat	Winter crop
OSR	Conventional OSR
OSR	Transgenic OSR
Barley	Winter crop
Fallow	Autumn-sown set-aside

 All the crops to be used within the project must be listed here.

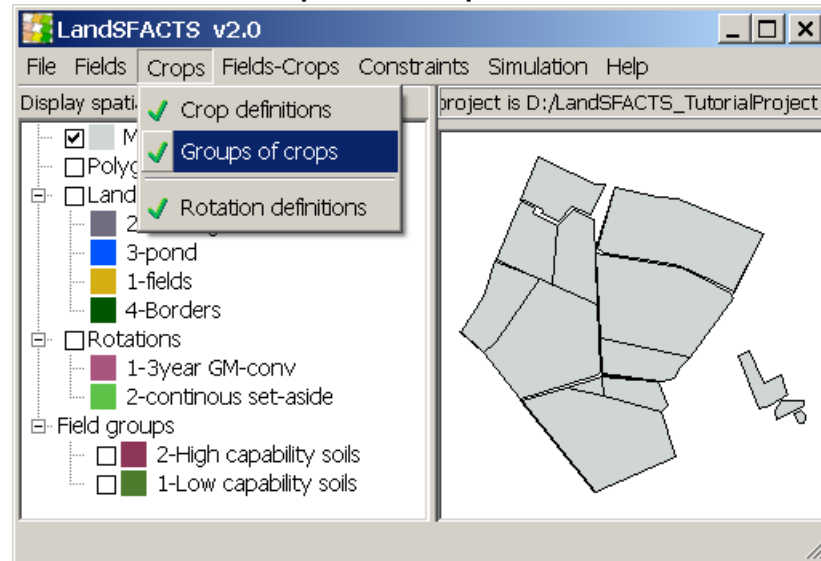
Final crop table

g. Link crop names with crop types, by selecting rows on the left and right boxes & down arrow.

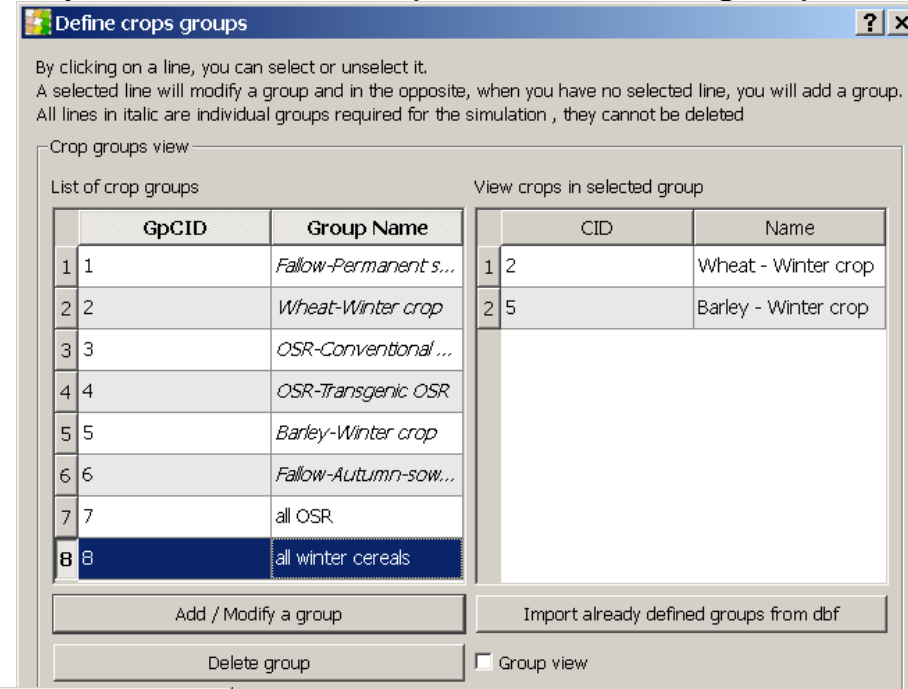
# 5. Create project 6. Fields 7. Crops 8. Fields-Crops 9. Constraints 10. Simulation


## 2. Groups of crops

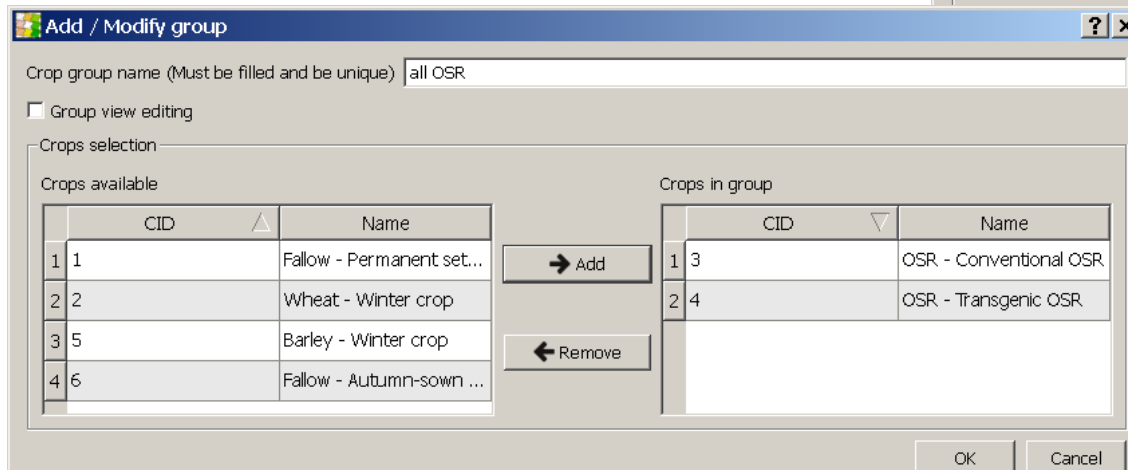
### a. Select “Groups of crops”



### b. By default, each crop individual is a group



 “Add/Modify a group” is only available if no group in italic are highlighted.

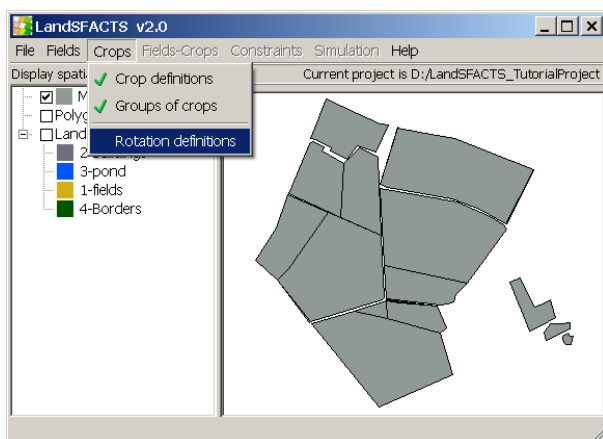


### c. Click on “Add / Modify a group”, and create 2 groups:

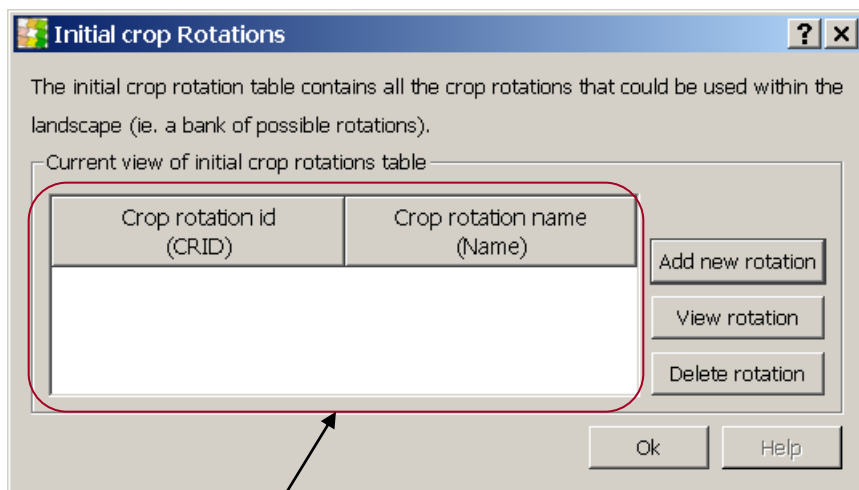
- with all OSR (conventional and transgenic)
- with all winter cereals (barley & wheat)



## a. Select rotations definition



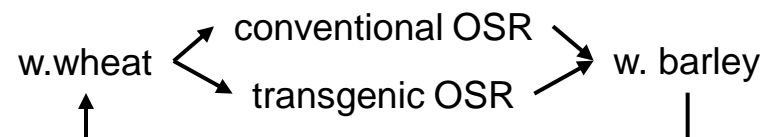
## b. "Add new rotation"



List of all rotations

## 2 Crop rotations to implement:

- "3 years rotation"



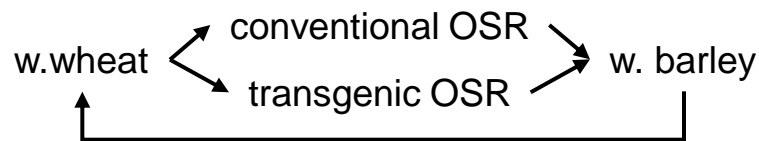
### → the rotation's Transition matrix:

(probabilities of any crop following any other crop in consecutive years, i.e. Markov chains)  
year n+1

	winter wheat	conv. OSR	GM OSR	winter barley
winter wheat	0	0.5	0.5	0
conv. OSR	0	0	0	1
GM OSR	0	0	0	1
winter barley	1	0	0	0

Each row must sum to 1 exactly  
Cf. Helpfile for further information.

- "permanent set-aside" → fallow



c. Fill up rotation name, and select crops on left box + right arrow

**Crop rotation setup wizard - Step 1 of 3**

Rotation name:

Available crops

Crop name	Crop type
Fallow	Permanent set-as...
Wheat	Winter crop
OSR	Conventional OSR
OSR	Transgenic OSR
Barley	Winter crop
Fallow	Autumn-sown se...

→

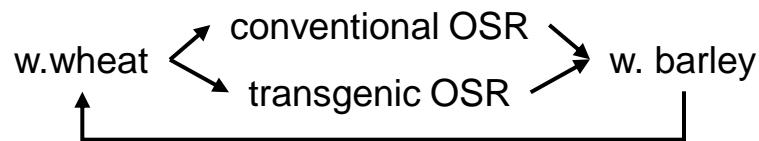
←

Crop order for transition matrix

Crop	Crop Type
Wheat	Winter crop
OSR	Conventional OSR
OSR	Transgenic OSR
Barley	Winter crop

The same crop may be listed several times

# 5. Create project 6. Fields 7. Crops 8. Fields-Crops 9. Constraints 10. Simulation 3. Rotation definitions (3/6)



## d. Fill up transition matrix

**Crop rotation setup wizard - Step 2 of 3**

The transition matrix below represents the probabilities of transitions between crops, with:

- 0.00 =< probability =< 1.00
- if probability = 0: forbidden transition
- if probability = 1: compulsory transition
- > Each row MUST add up to 1.00 exactly

Saving period:  Burn-in period:

Crop grown in year n+ 1

	Wheat - Winter crop	OSR - conventional OS	OSR - Transgenic OSR	Barley - Winter crop
Wheat - Winter crop	0.00	0.5	0.5	0.00
OSR - Conventional OSR	0.00	0.00	0.00	1
OSR - Transgenic OSR	0.00	0.00	0.00	1
Barley - Winter crop	1	0.00	0.00	0.00

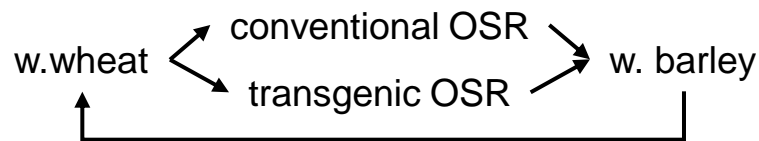
Crop grown in year n

Buttons:

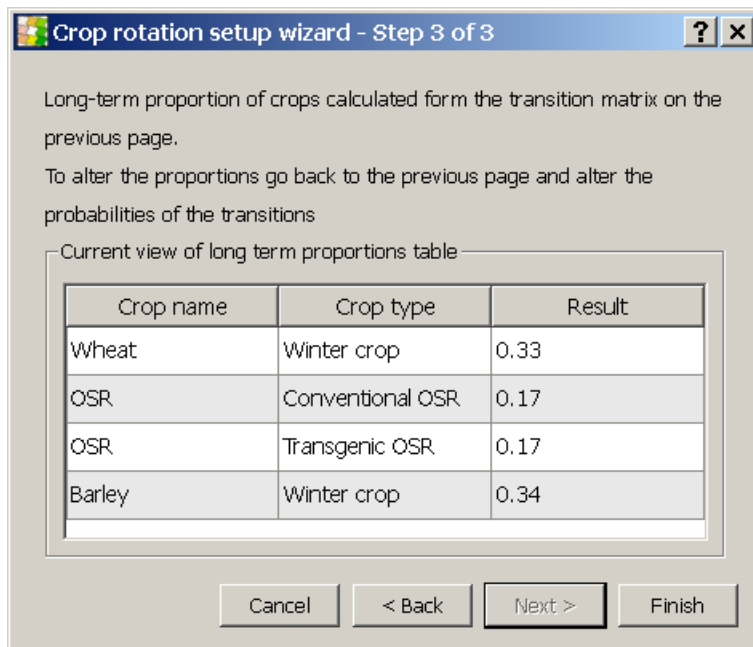
- Set fixed Rotation
- Set equal Rotation
- Set constant Rotation
- Export rotation matrix
- Import rotation matrix

Navigation buttons:

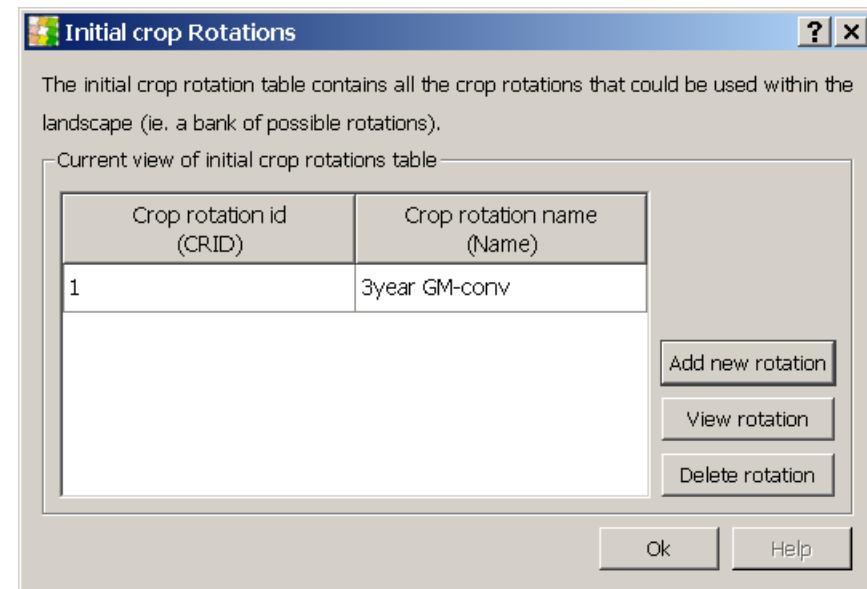
- Cancel
- < Back
- Next >
- Finish



e. long-term crop proportions are displayed.  
Click finish.



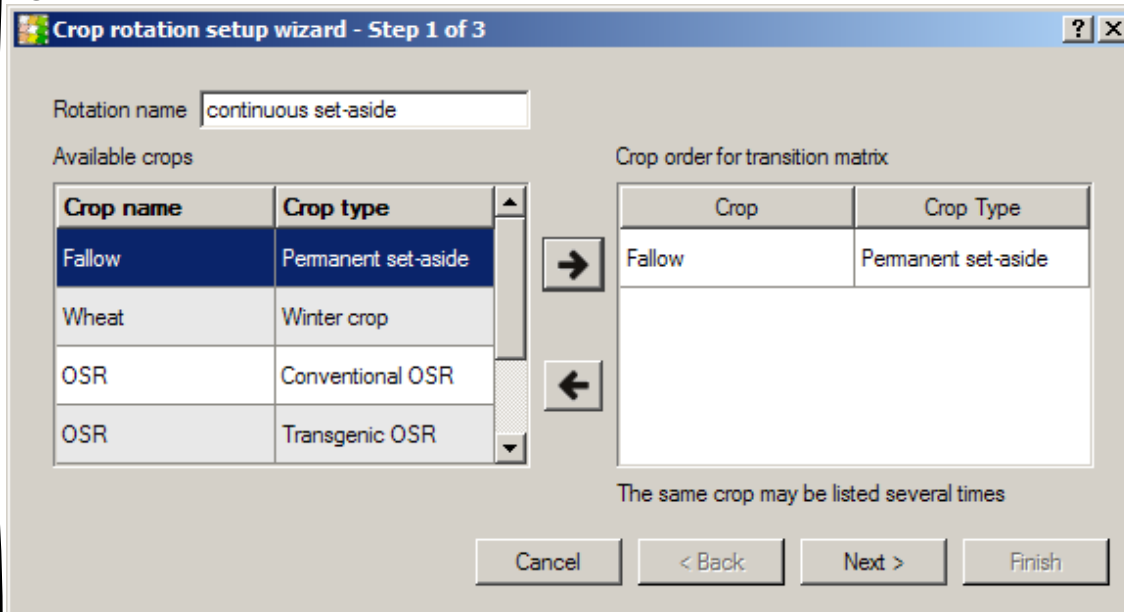
f. The rotation is now listed,  
add new rotation



# 5. Create project 6. Fields 7. Crops 8. Fields-Crops 9. Constraints 10. Simulation

## 3. Rotation definitions (5/6)

g. Fill up rotation name, and select fallow-permanent set-aside



**Crop rotation setup wizard - Step 1 of 3**

Rotation name: continuous set-aside

Available crops

Crop name	Crop type
Fallow	Permanent set-aside
Wheat	Winter crop
OSR	Conventional OSR
OSR	Transgenic OSR

Crop order for transition matrix

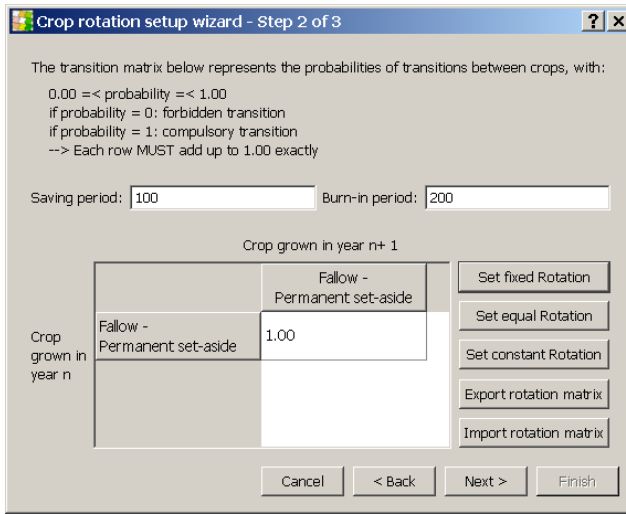
Crop	Crop Type
Fallow	Permanent set-aside

The same crop may be listed several times

Buttons: Cancel, < Back, Next >, Finish

i. long-term crop proportions are displayed. Click finish.

h. Fill up transition matrix (only a 1)



**Crop rotation setup wizard - Step 2 of 3**

The transition matrix below represents the probabilities of transitions between crops, with:

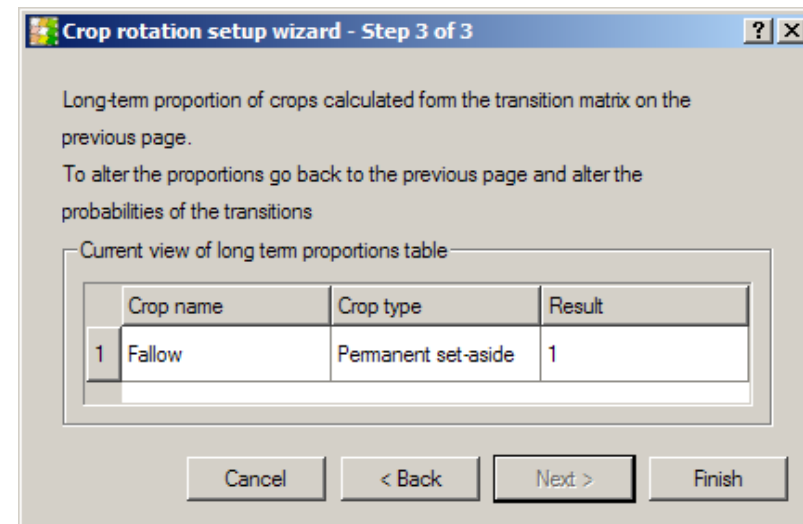
- 0.00 =< probability =< 1.00
- if probability = 0: forbidden transition
- if probability = 1: compulsory transition
- > Each row MUST add up to 1.00 exactly

Saving period: 100 Burn-in period: 200

Crop grown in year n+1

	Fallow - Permanent set-aside
Crop grown in year n	1.00

Buttons: Set fixed Rotation, Set equal Rotation, Set constant Rotation, Export rotation matrix, Import rotation matrix, Cancel, < Back, Next >, Finish



**Crop rotation setup wizard - Step 3 of 3**

Long-term proportion of crops calculated from the transition matrix on the previous page.

To alter the proportions go back to the previous page and alter the probabilities of the transitions

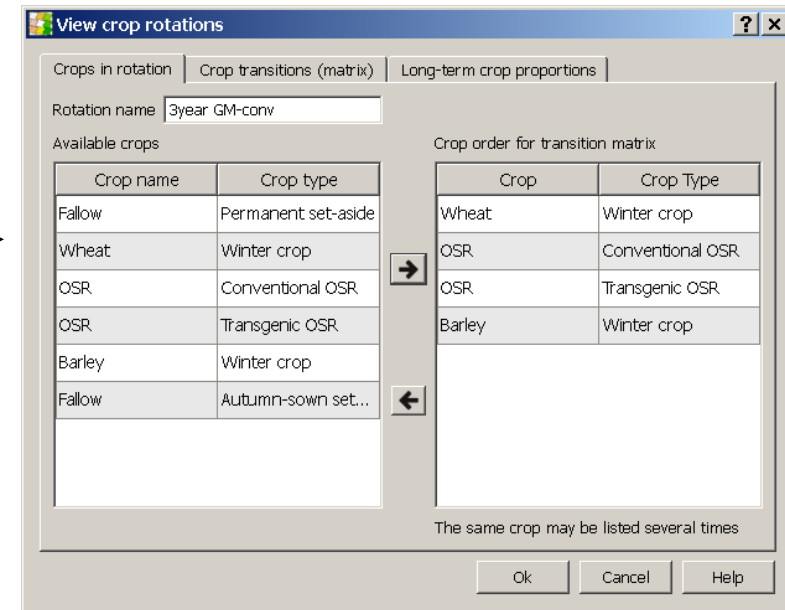
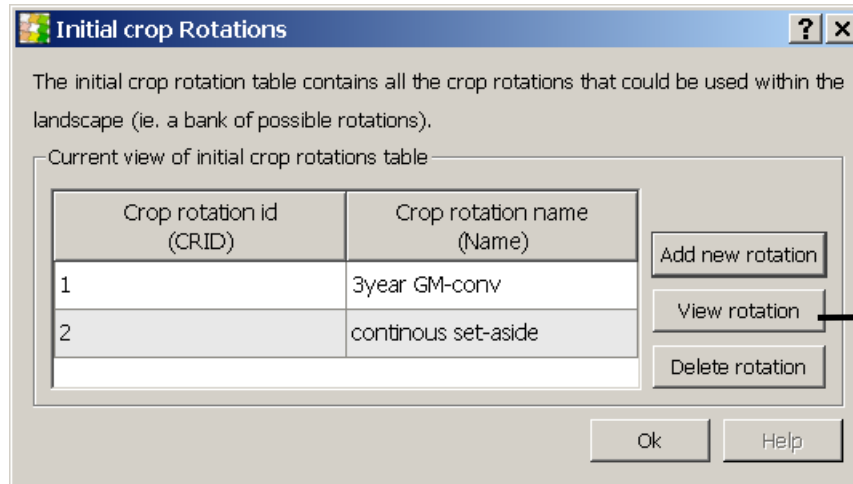
Current view of long term proportions table

	Crop name	Crop type	Result
1	Fallow	Permanent set-aside	1

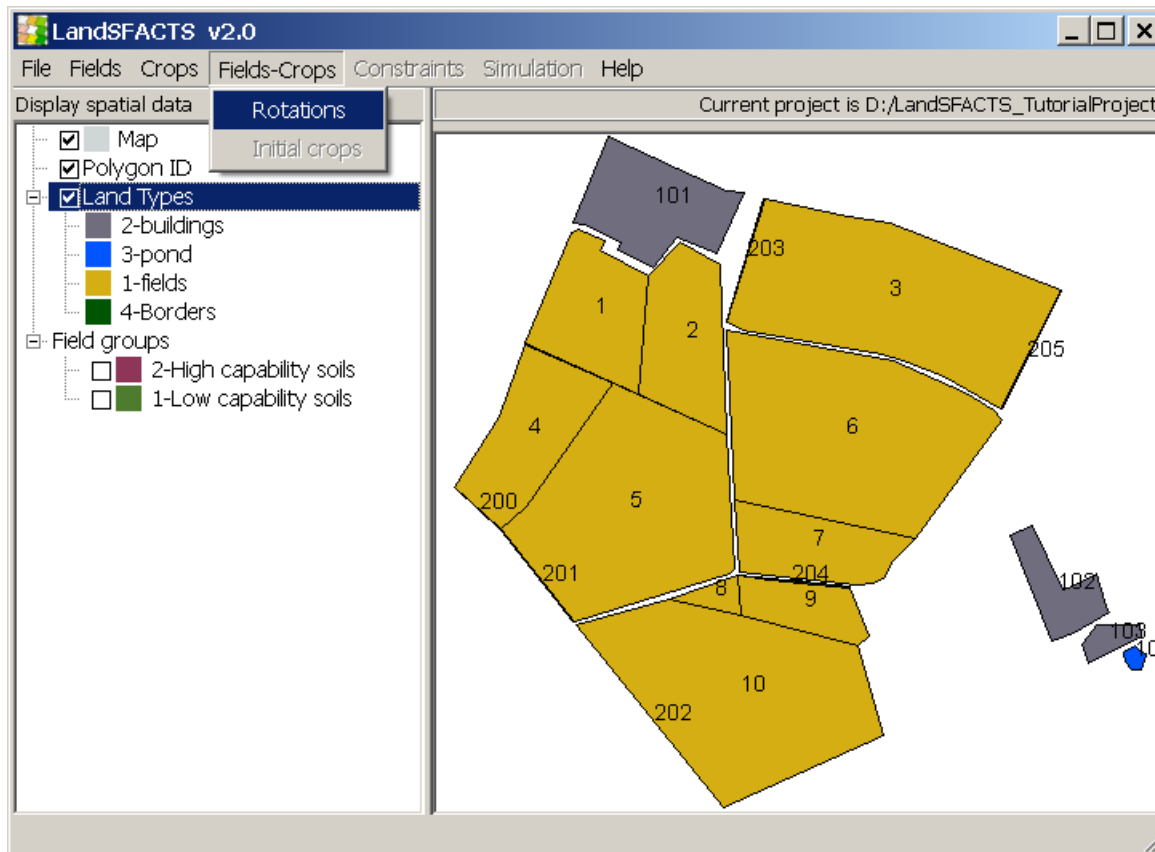
Buttons: Cancel, < Back, Next >, Finish



j. The 2 rotations are listed



a. Select Rotations within Fields - Crops



b. Assign “continuous set-aside” to “Low capability soils” field’s group using the “add” button

And then the “3year GM-conv” to “High capability soils”.

**Fields - Crops: Linking rotations to fields**

Assign rotations to fields | Long term crop proportions

Assign rotations to fields or group of fields by clicking on the desired rows and then click Add button.

Select by field OR Select by group of fields Rotation to assign

Field ID (PlgID)	Group name	Rotation name (Name)
1	low capability soils	3year GM-conv
2	high capability soils	continuous set-aside
3		

↓ Add ↑ Remove

Import from dbf

Use RotationsFields program

Remove all rotations assigned to fields

Rotations assigned to fields

View by fields View by group of fields

Field ID (PlgID)	Rotation name (Name)	Fields not in groups	Field Groups name	Rotation name (Name)

It is not possible to select non-consecutive rows when removing rotations assigned to fields

OK

# 5. Create project 6. Fields 7. Crops 8. Fields-Crops 9. Constraints 10. Simulation

## 1. Linking rotations to fields (3/3)

### c. All fields have now a rotation

**Fields - Crops: Linking rotations to fields**

Assign rotations to fields | Long term crop proportions

Assign rotations to fields or group of fields by clicking on the desired rows and then click Add button

Select by field OR Select by group of fields

Field ID (PkgID)	Group name	Rotation to assign
		3year GM-conv
		continuous set-aside

↓ Add    ↑ Remove

Import from dbf

Use RotationsFields program

Remove all rotations assigned to fields

Rotations assigned to fields

View by fields    View by group of fields

Field ID	Rotation name (Name)	Fields not in groups	Field Groups name	Rotation name (Name)
6	3year GM-conv	0	high capability soils	3year GM-conv
7	continuous set-aside	0	low capability soils	continuous set-aside

It is not possible to select non-consecutive rows when removing rotations assigned to fields

OK

e. The rotation allocation can be displayed

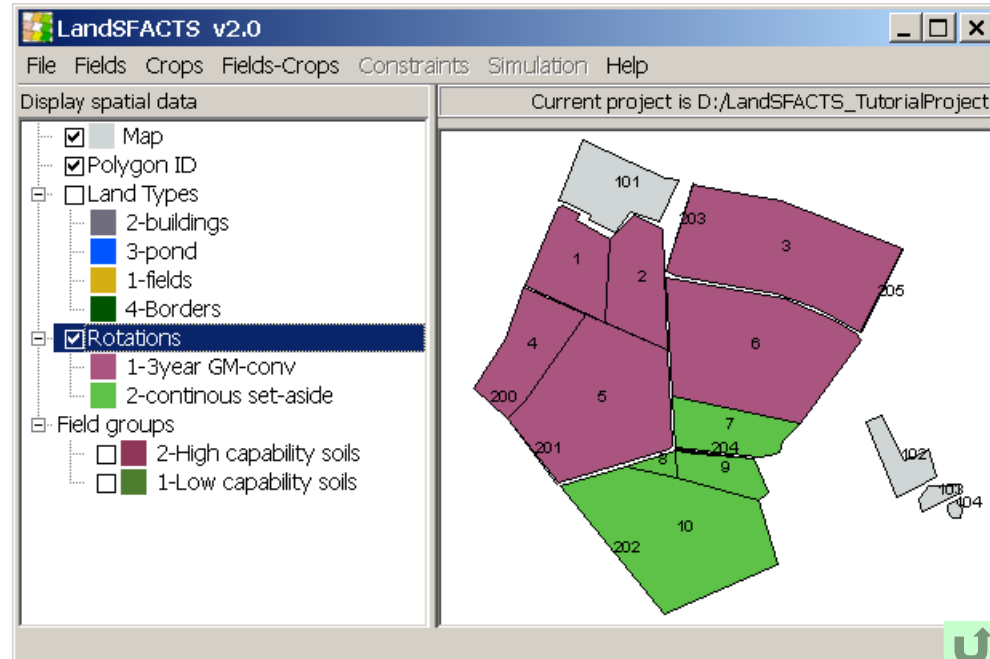
### d. Long term crop proportions are calculated

**Fields - Crops: Linking rotations to fields**

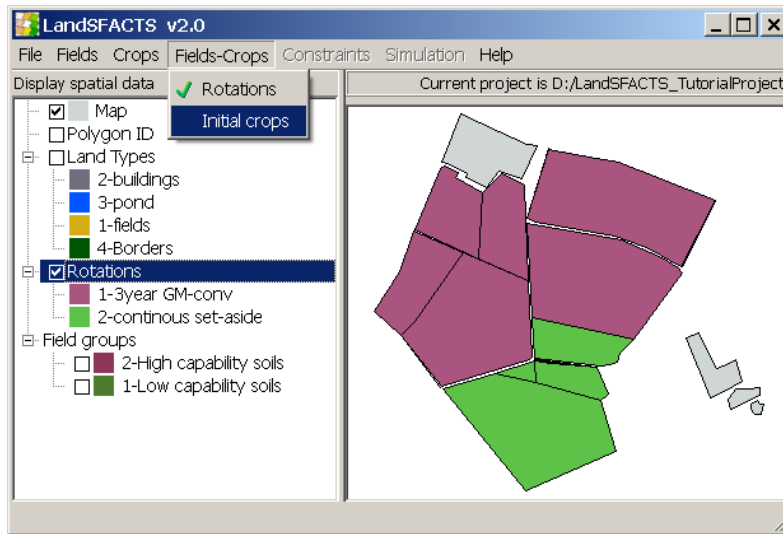
Assign rotations to fields | Long term crop proportions


Long term amounts of each crop are calculated from the area of the field assigned to the crop rotation that contains the crop. To alter the proportions below, alter the links between rotations and fields or alter the crop proportion.

Crops	Definitions	Proportion of area (%)
Fallow	Permanent set-aside	26.29
Wheat	Winter crop	24.51
OSR	Conventional OSR	12.26
OSR	Transgenic OSR	12.26
Barley	Winter crop	24.69

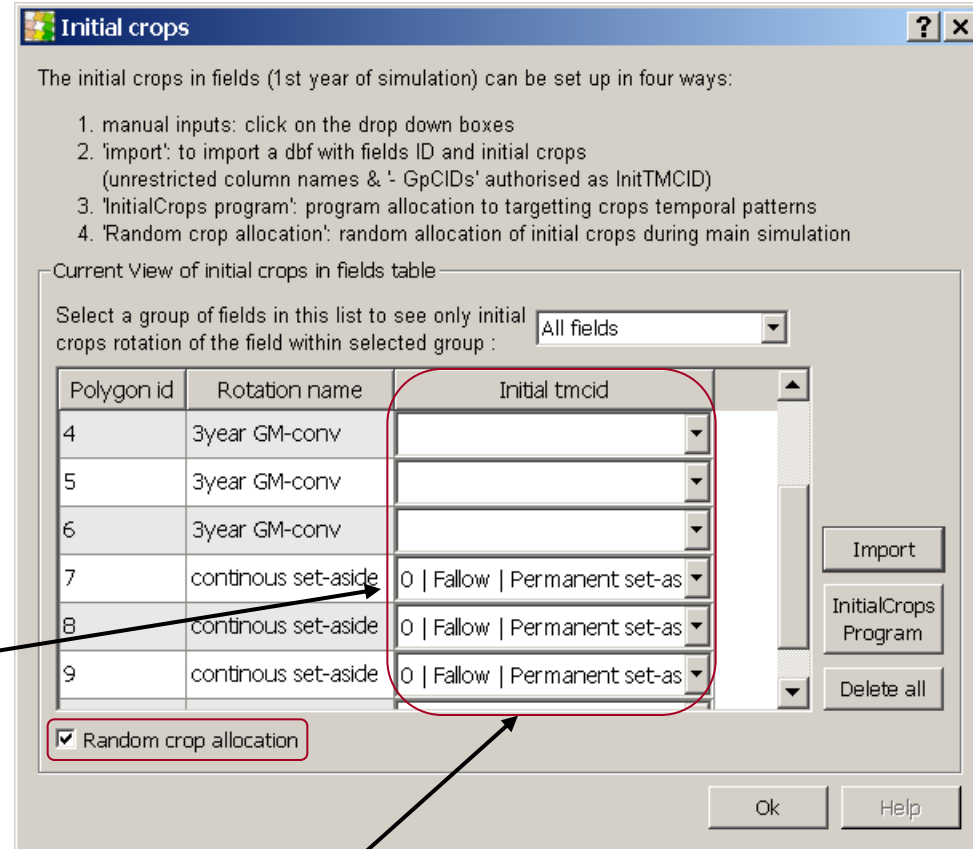



a. Select "Initial crops" in "Fields-Crops"



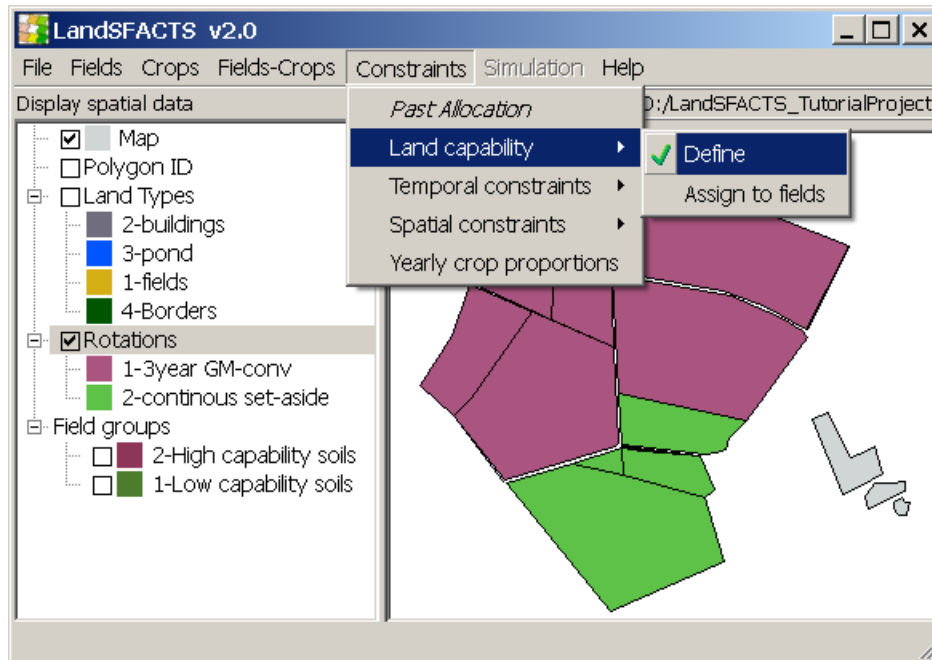
 If only one crop is present within the rotation, it is automatically selected.

b. Select "random crop allocation"

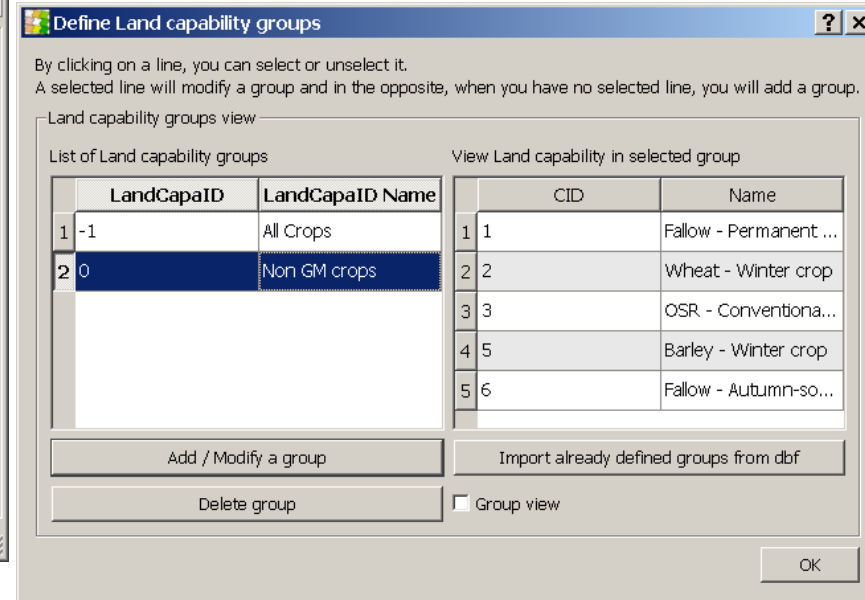


 Initial crops (referenced by their place within the rotation).

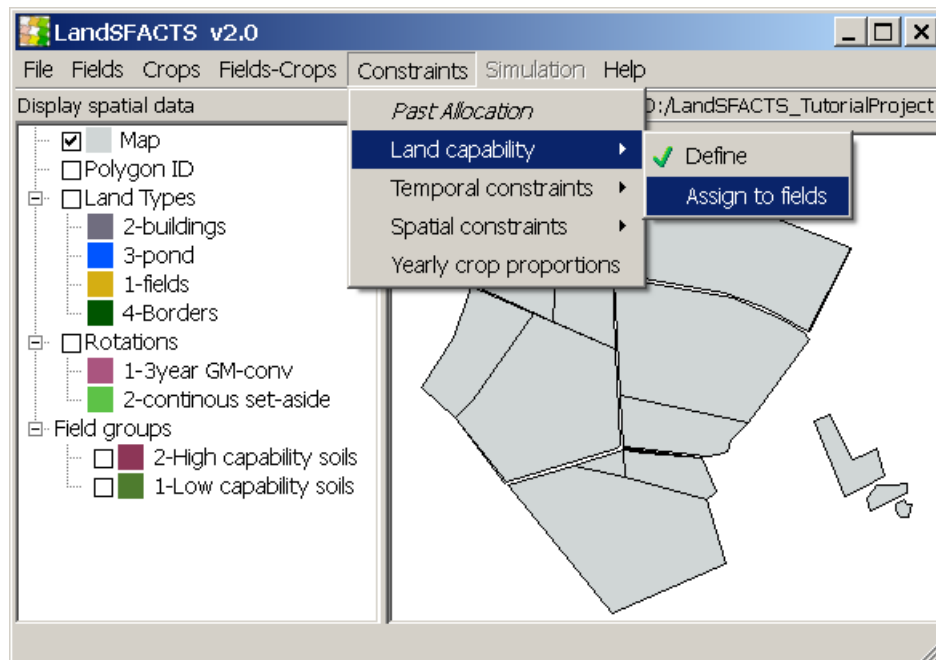
a. Select "Define" in "Land capability"



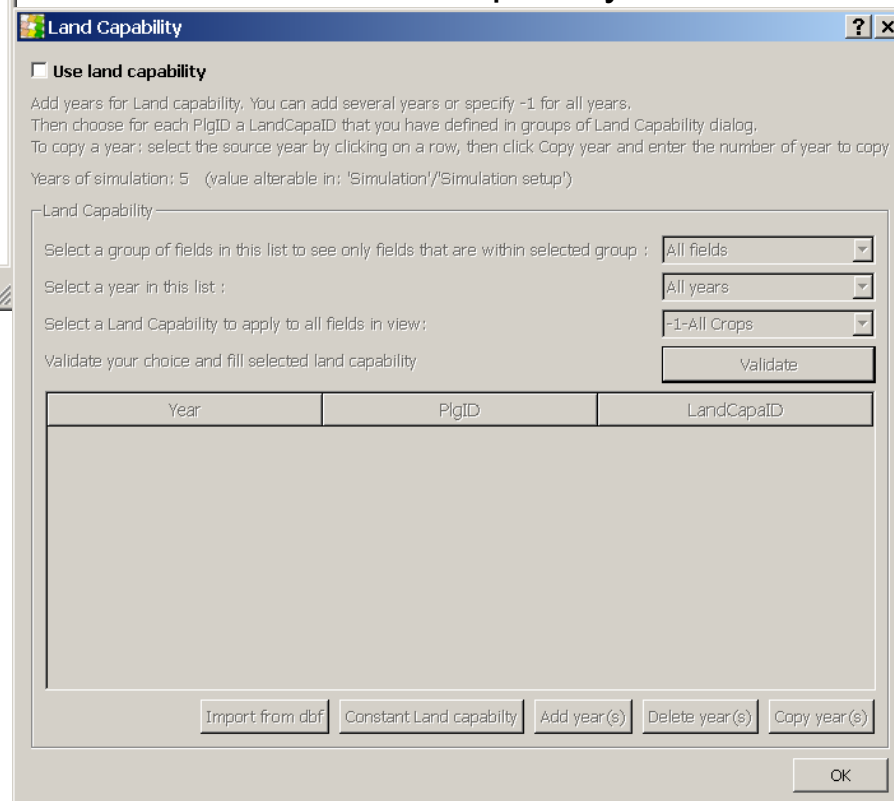
b. By default a class is created for all the crops, add one more group with all non GM crops



a. Select “Assign to fields” in “Land capability”



b. By default, no land capability are used, click on “Use land capability” to enable it.



We want to allow “non GM crops” for all the fields for the first three years, and then allow GM for the last two. (5 years simulations)

c. Click on “Add year(s)”, write “5” year. By default all the crops are authorised for all the fields.

d. In the filters, select “year 0”, select land capability “non GM crops”, click on validate.

e. Same as (d) for “year 1” and “year 2”

**Land Capability**

☒ Use land capability

Add years for Land capability. You can add several years or specify -1 for all years.  
Then choose for each PlgID a LandCapaID that you have defined in groups of Land Capability dialog.  
To copy a year: select the source year by clicking on a row, then click Copy year and enter the number of year to copy

Years of simulation: 5 (value alterable in: 'Simulation'/'Simulation setup')

Land Capability

Select a group of fields in this list to see only fields that are within selected group : All fields

Select a year in this list : Year 0

Select a Land Capability to apply to all fields in view: 0-Non GM crops

Validate your choice and fill selected land capability

Validate

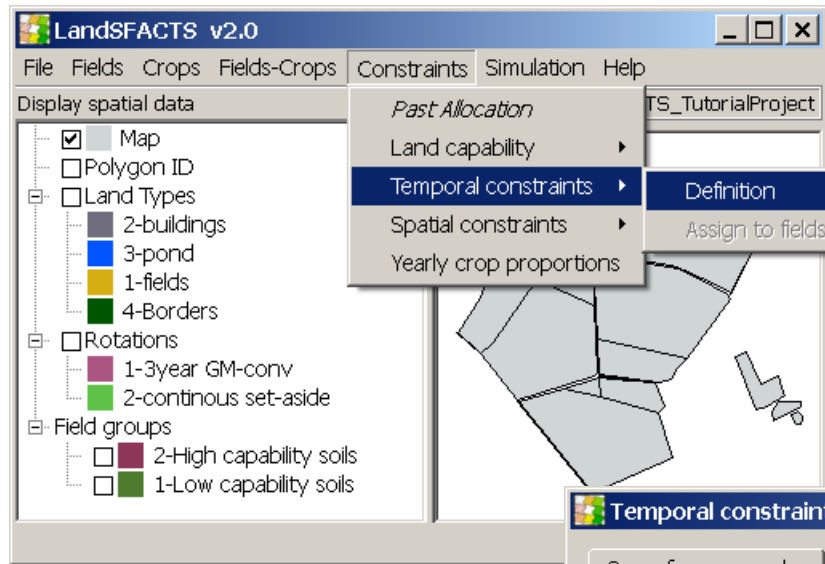
Year	PlgID	LandCapaID
0	1	0-Non GM crops
0	2	0-Non GM crops
0	3	0-Non GM crops
0	4	0-Non GM crops
0	5	0-Non GM crops
0	6	0-Non GM crops
0	7	0-Non GM crops
0	8	0-Non GM crops
0	9	0-Non GM crops
0	10	0-Non GM crops

Import from dbf Constant Land capability Add year(s) Delete year(s) Copy year(s)

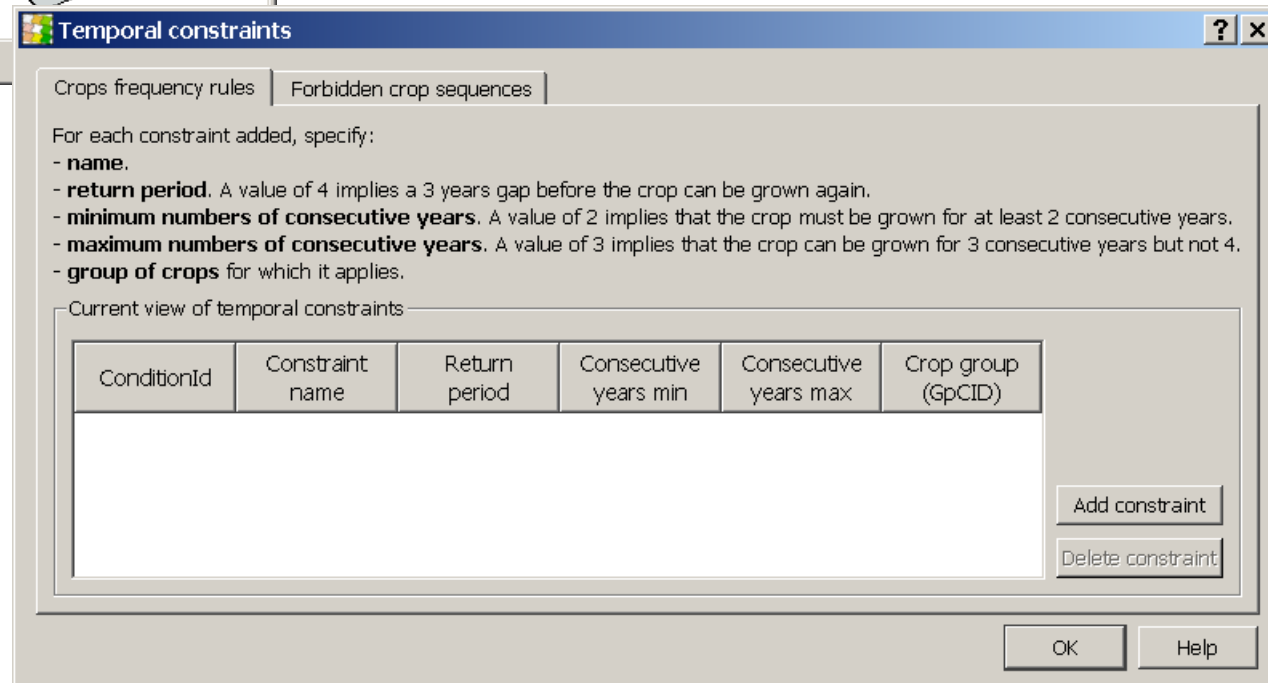
OK



## a. Select Temporal constraints - Definition



## b. Crops frequency rules, Select “Add constraints”



- c. Fill up with: “winter cereals”, return period: 1, maximum consecutive years: 3  
crops: winter wheat  
& winter barley

→ those two crops can be grown in the same field up to 3 years in a row.

**Temporal constraints**

Crops frequency rules | Forbidden crop sequences

For each constraint added, specify:

- **name.**
- **return period.** A value of 4 implies a 3 years gap before the crop can be grown again.
- **minimum numbers of consecutive years.** A value of 2 implies that the crop must be grown for at least 2 consecutive years.
- **maximum numbers of consecutive years.** A value of 3 implies that the crop can be grown for 3 consecutive years but not 4.
- **group of crops** for which it applies.

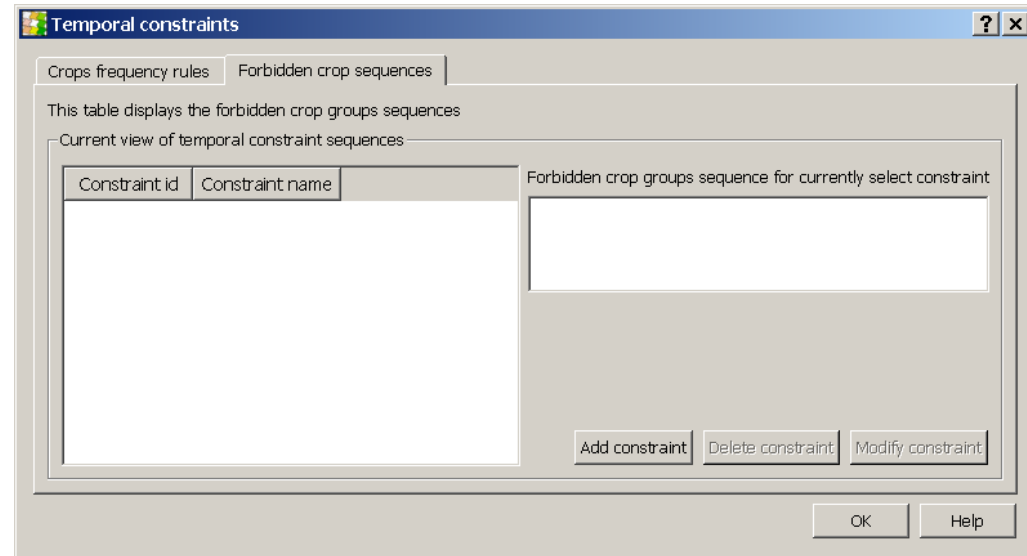
Current view of temporal constraints

ConditionId	Constraint name	Return period	Consecutive years min	Consecutive years max	Crop group (GpCID)
2	winter cereals	1	1	3	8-winter cereals

1-Fallow...et-aside  
2-Whea...r crop  
3-OSR-...al OSR  
4-OSR-...ic OSR  
5-Barle...er crop  
6-Fallow...et-aside  
7-all OSR  
8-winter cereals

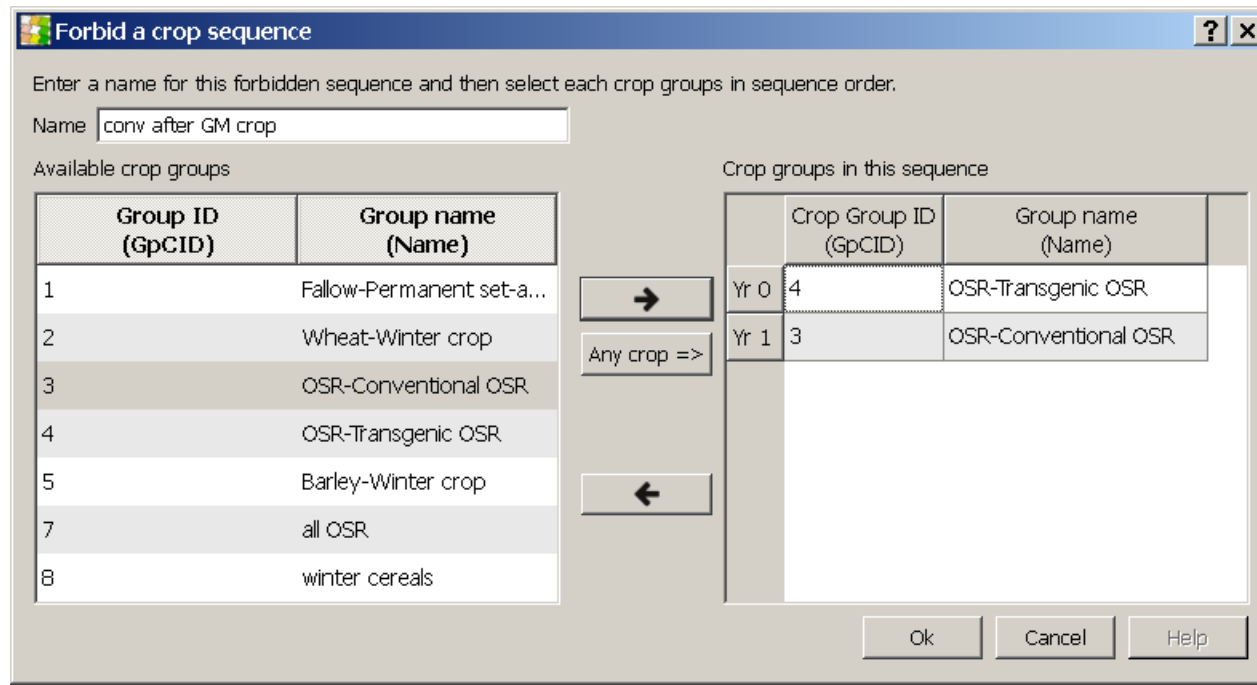
Add constraint  
Delete constraint  
OK Help

e. Forbidden crop sequence tabulation,  
click “add constraint”.

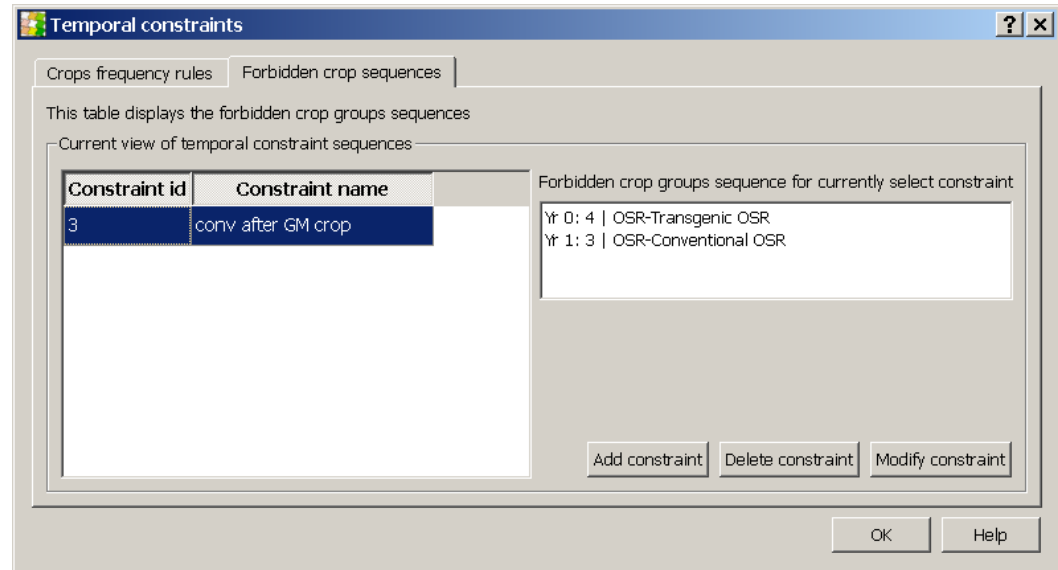


f. add a constraint with:  
Name: conv after GM crop  
Yr 0: GM OSR  
Yr 1: conv OSR

→ conventional OSR  
cannot be grown after a  
GM OSR in the same  
field.



g. the new constraint is displayed in main window.



h. add a constraint with:  
Name: conv after GM

1year gap

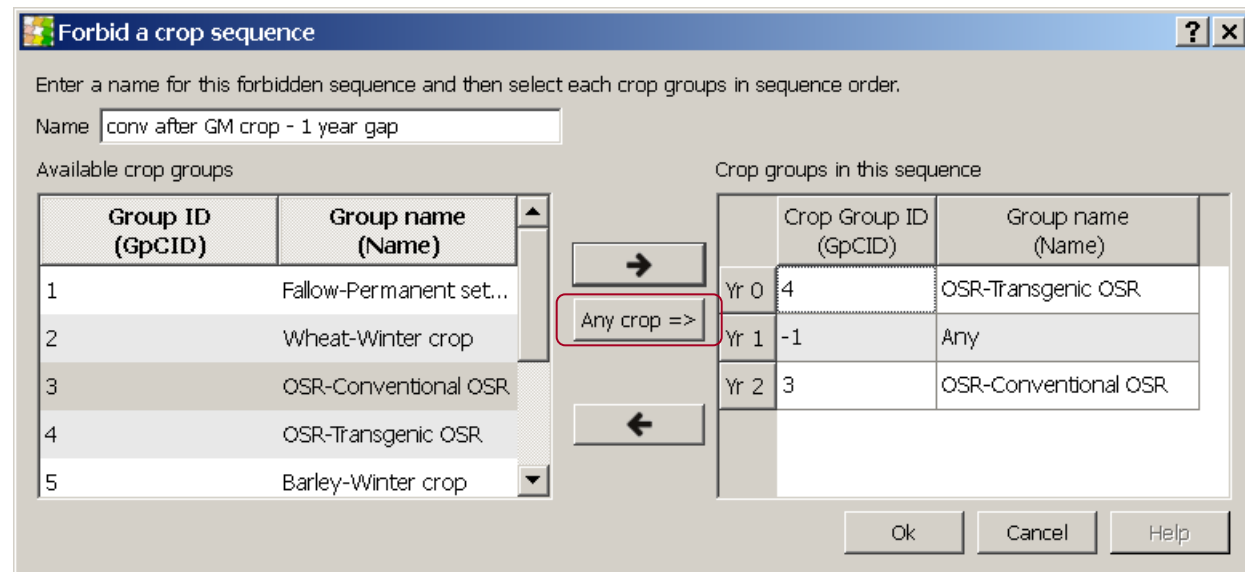
Yr 0: GM OSR

Yr 1: any

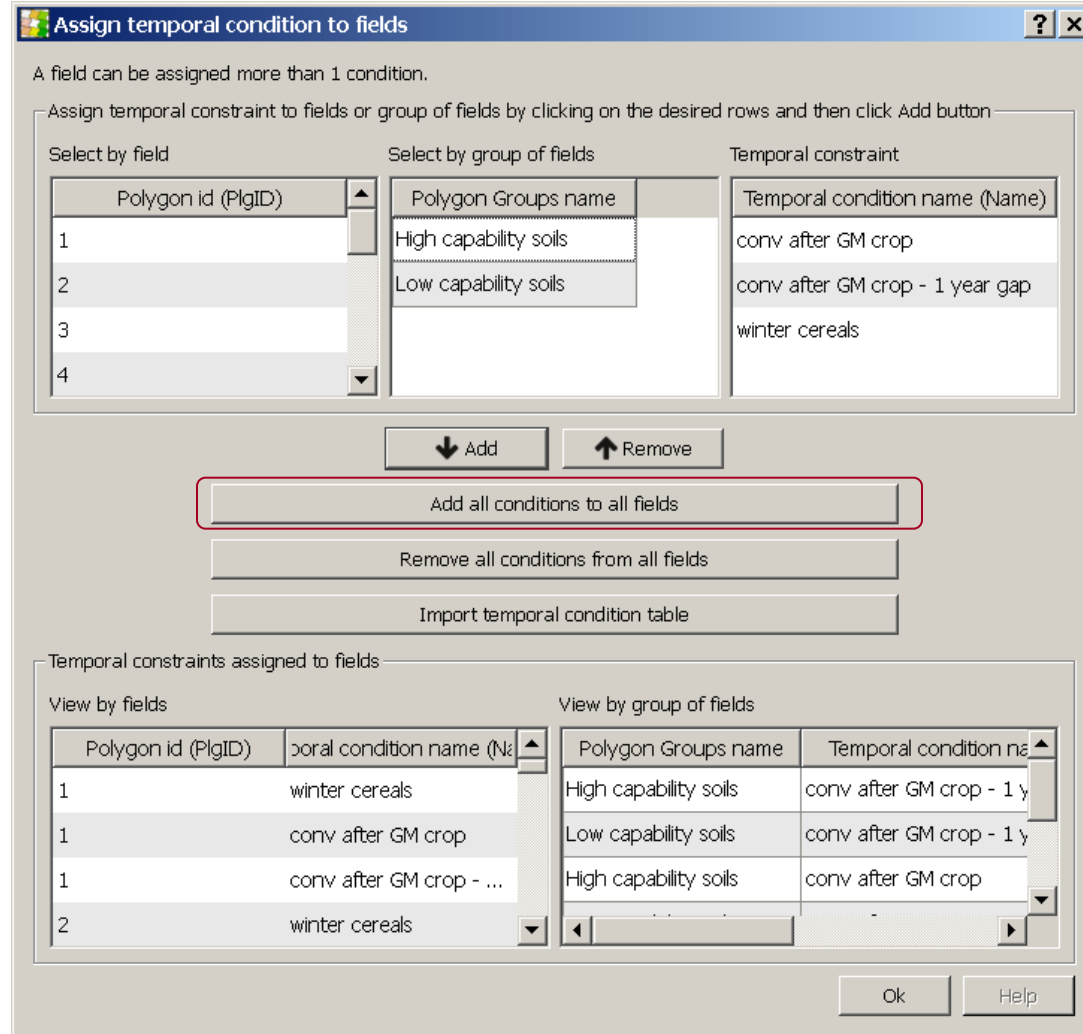
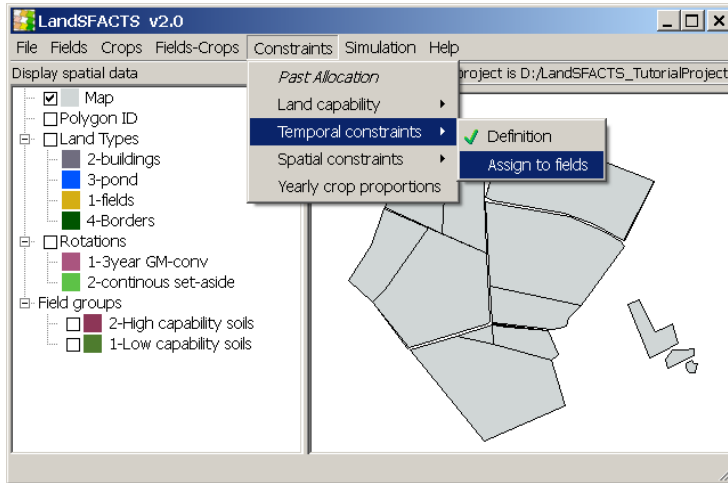
Yr 2: conv OSR

→ conventional OSR  
cannot be grown if GM  
OSR was grown two  
years ago in the same  
field.

i. click Ok to exit

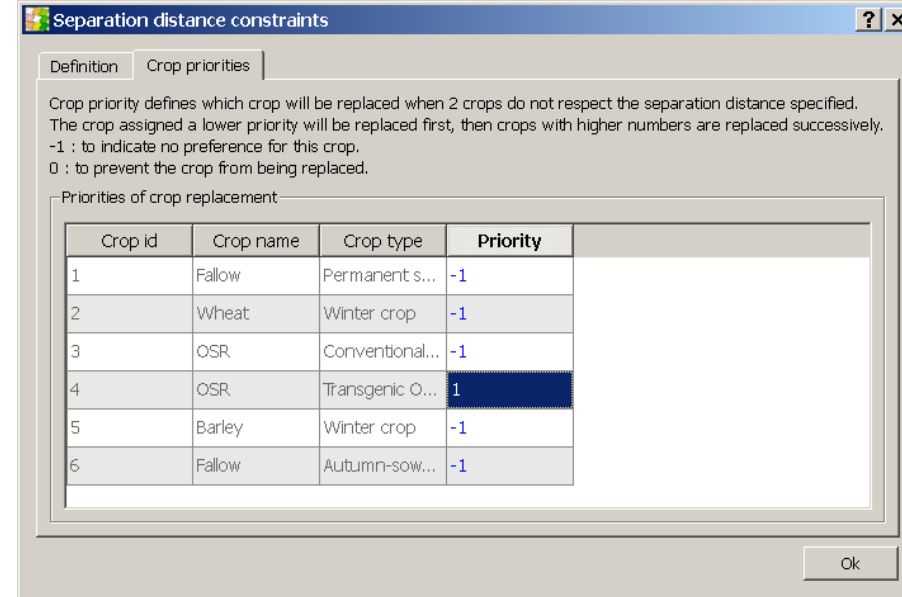
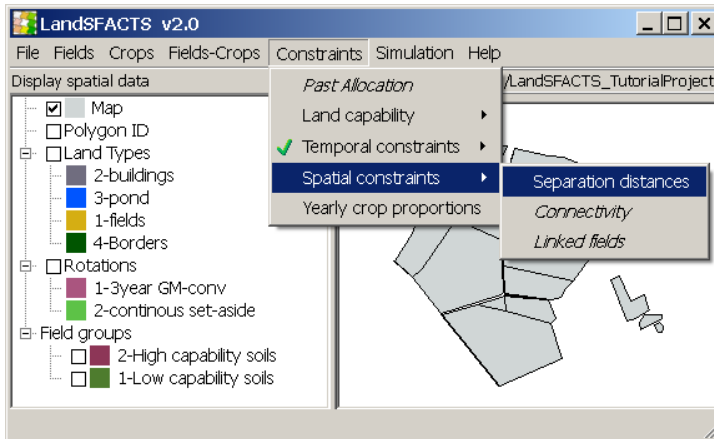


## j. Select Temporal constraints – Assign to fields

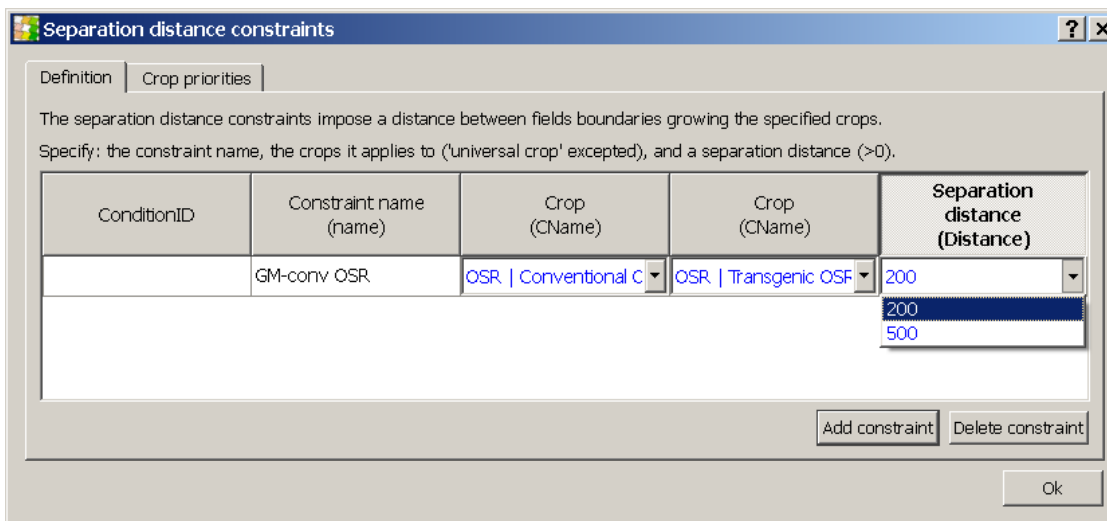


k. Select on which fields the temporal constraints must be applied.  
Use: "Add all conditions to all fields".

### a. Select “Spatial constraints” / “Separation distances”

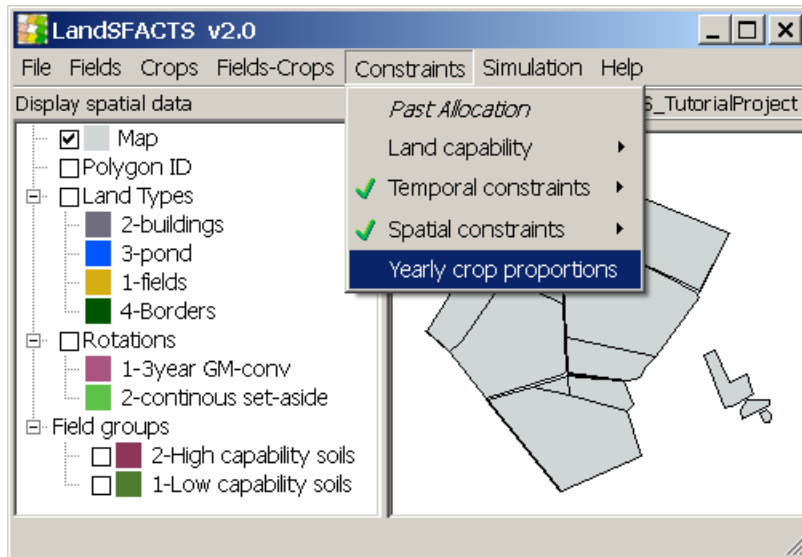


### b. Add constraint: 200m between GM and conv. OSR



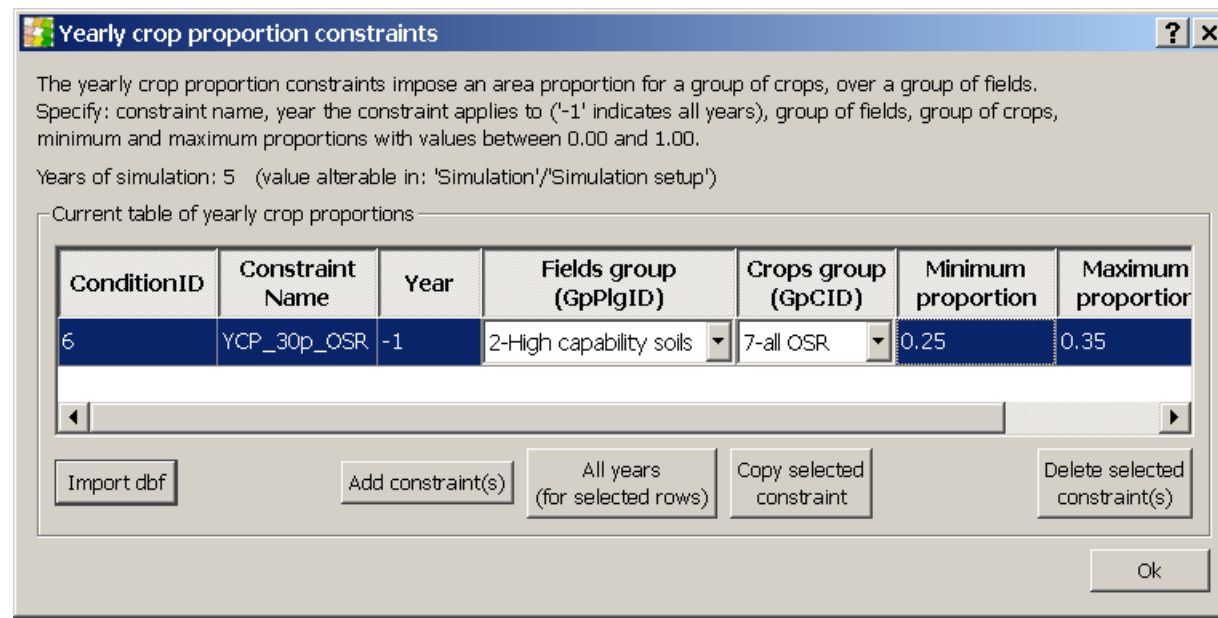
c. Priority of “1” for GM OSR (if GM and conv conflict, the GM will be changed)

### a. Select Yearly crop proportions

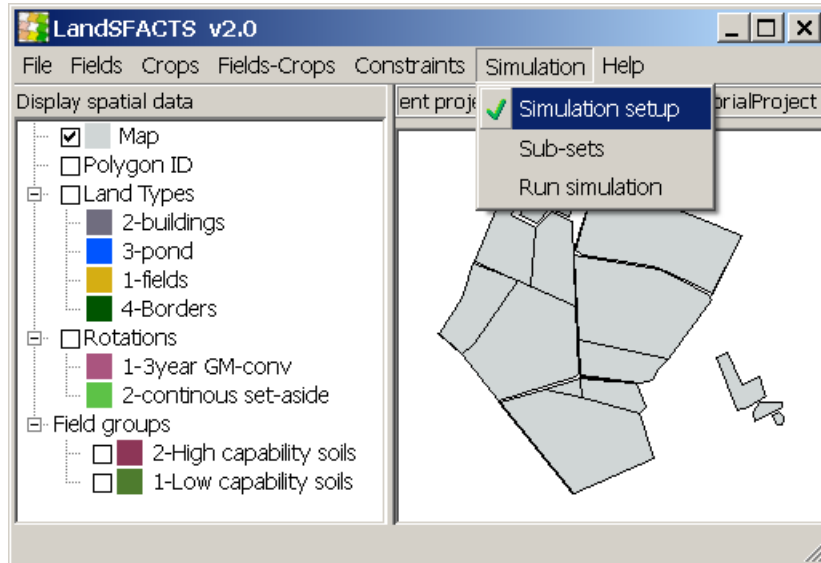


Aim: about 30% OSR (GM + conv) over all the fields with the 3years rotation over the whole simulation (5 years)

b. Click “Add constraints”, add 1.  
Name: YCP\_30p\_OS  
Year: -1 (all years)  
Fields group: High capability soils  
Crops group: all OSR  
Minimum: 0.25  
Maximum: 0.35



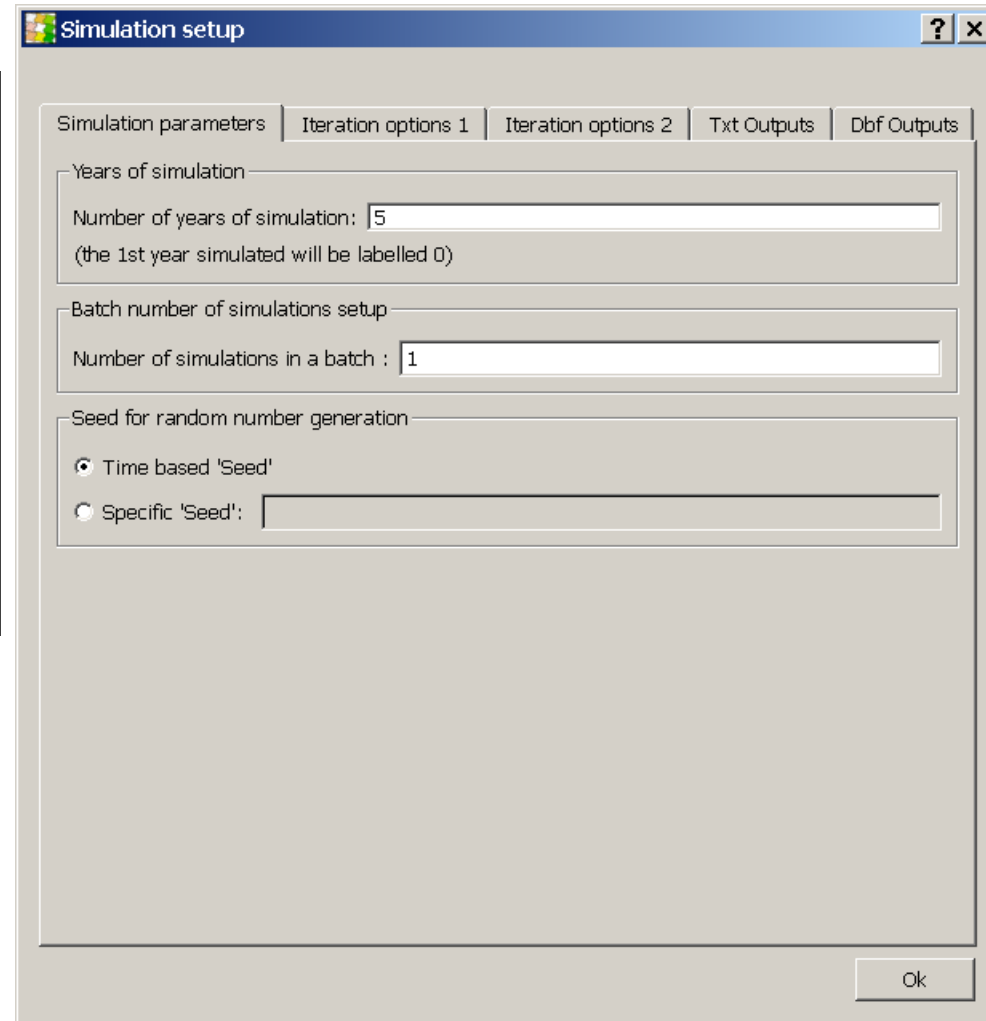
### a. Select Simulation set up



### b. Fill up “Simulation parameters”

simulation years : 5

Batch: 1





### c. Select tab: “iteration options 1”

**Simulation setup**

Simulation parameters | **Iteration options 1** | Iteration options 2 | Txt Outputs | Dbf Outputs

When the crops in any fields do not meet the required constraints, the crop allocation will be altered using the following iteration options, successively.

**Crop Reallocation options:**

**1. Crops changed in all the fields**

New random choice within crop rotation (transition matrices), or initial crops (only if initial crops are 'randomly allocated', cf. Assign to fields/Initial crops)

Maximum iterations:  Penalty to field:

**2. Crop changed in only one problematic field**

2.1. New random choice within crop rotation, respecting the probabilities of transition matrices

Maximum iterations:  Penalty to field:

2.2. New random choice within crop rotation, **not** respecting the probabilities of transition matrices

Maximum iterations:  Penalty to field:

2.3. Crop replaced by another crop from the same group

Setup crop groups

Maximum iterations:  Penalty to field:

2.4. Crop replaced by universal crop

Maximum iterations:  Penalty to field:

Ok

### d. Alter option 1. (100 iterations)

**1. Crops changed in all the fields**

New random choice within crop rotation (transition matrices), or initial crops (only if initial crops are 'randomly allocated', cf. Assign to fields/Initial crops)

Maximum iterations:  Penalty to field:

### e. Alter option 2.1 (1,000 iterations)

**2.1. New random choice within crop rotation, respecting the probabilities of transition matrices**

Maximum iterations:  Penalty to field:

**Simulation setup**

Simulation parameters | Iteration options 1 | **Iteration options 2** | Txt Outputs | Dbf Outputs

☒ **Simulated annealing option.**

After  iterations not improving the crop allocation, the next new crop allocation will automatically be accepted to the the basis of further improvements (to avoid local minima).

☒ **Optimisation option.**

Land capability & temporal constraints must be met before other constraints are assessed.

☐ **Multi-Reallocation option.**

Instead of altering a crop at a time, up to  crops can be altered before assessing if they respect the constraints.

☐ **Recording penalties option.**

When an iteration option is used on a fields' crop, the corresponding penalty is assigned to the field.

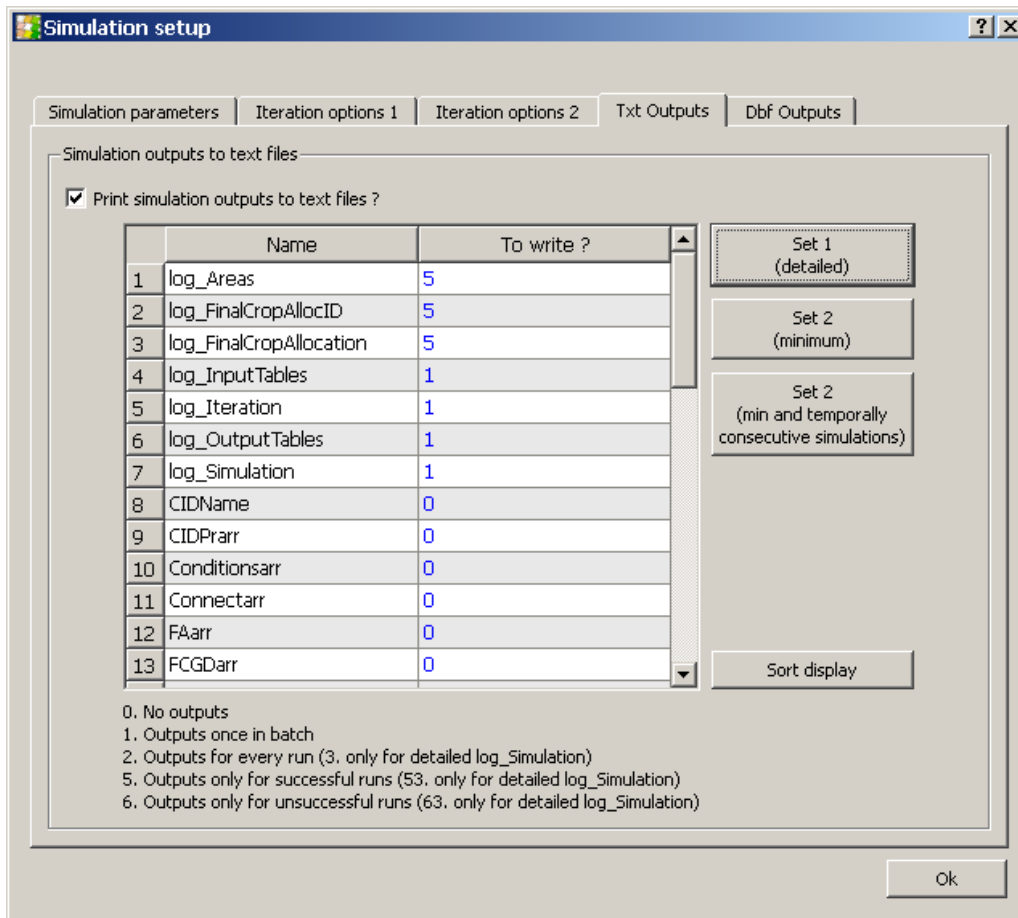
Ok

### f. Select tab: “iteration options 2”

- Tick “simulated annealing”, time = 20
- Tick optimisation option

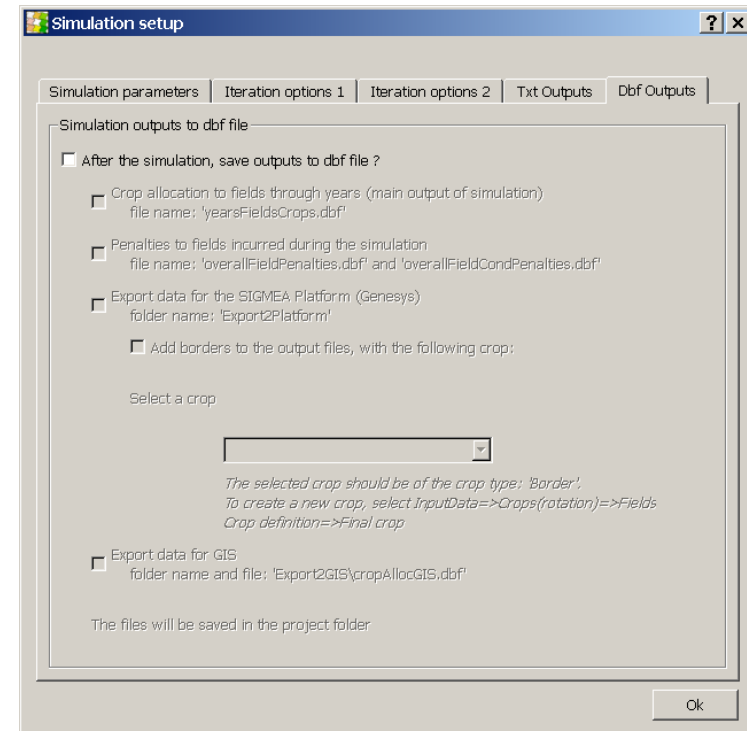
g. Select tab: “Txt Outputs”

Select the desired text output files (click on “Set 1 (detailed)”). At the end of the simulation, they will be saved within the “simulatorOutputs” folder within the project folder.

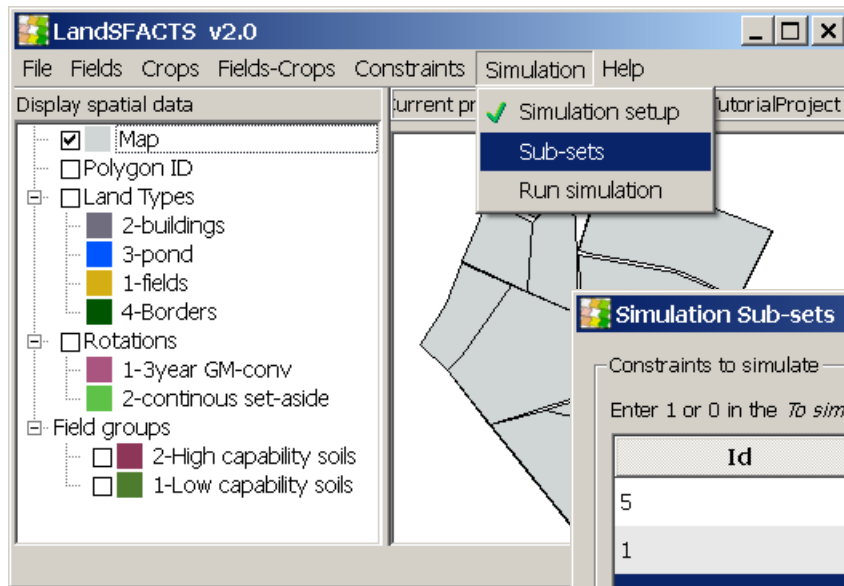


h. Select tab: “Dbf Outputs”

If outputs needs to be in dbf, select those options.

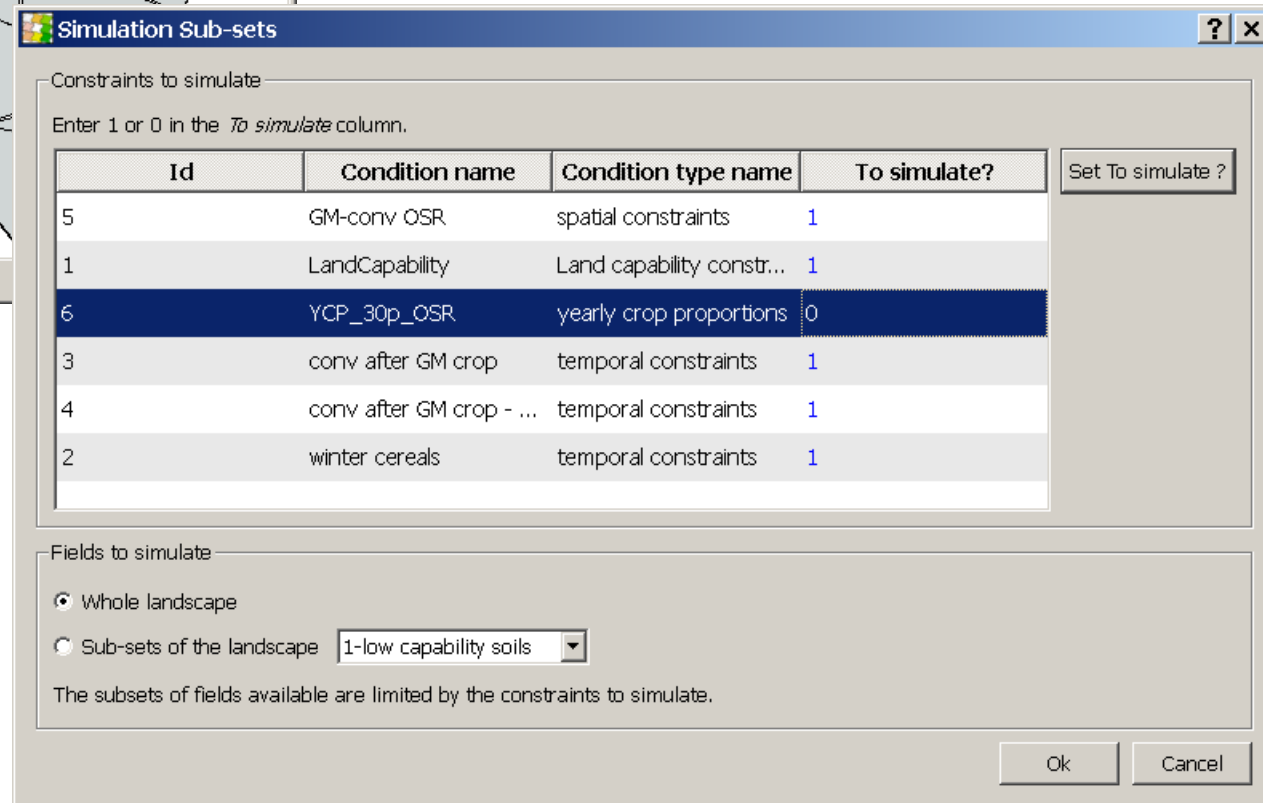


### a. Select Sub-sets

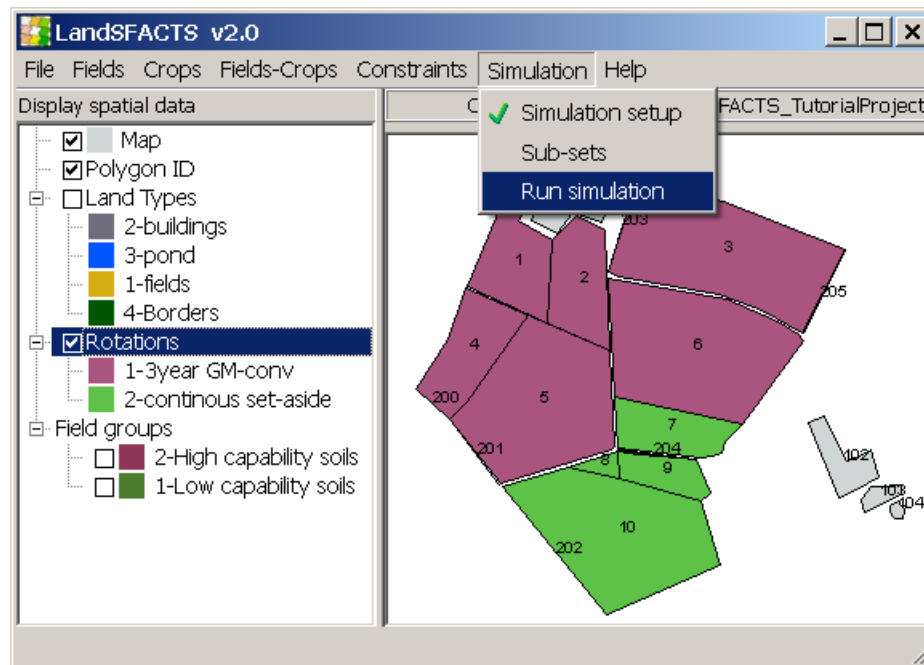


If desired, it is possible to unselect any conditions to simulate and/or to limit the simulation to a subgroup

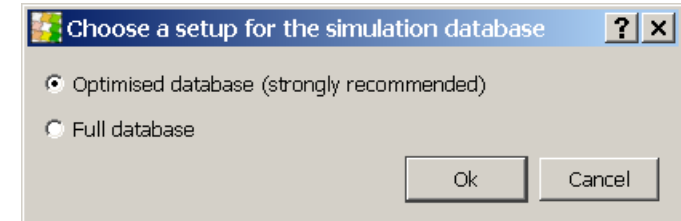
### b. Set the condition Yearly crop proportion to 0 (i.e. it will not be simulated)



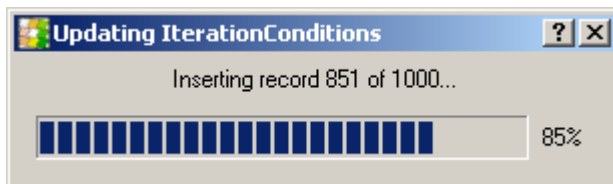
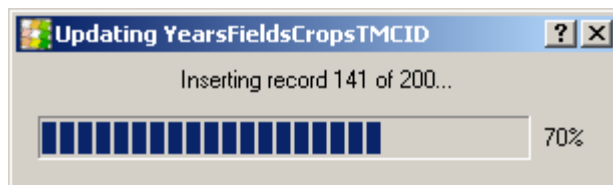
a. Select “Run simulation”



b. Confirm for “optimised database”, and click ok.



c. The simulation may take several minutes



c. At the end of the simulation, the following table is displayed:

**Simulation Results**

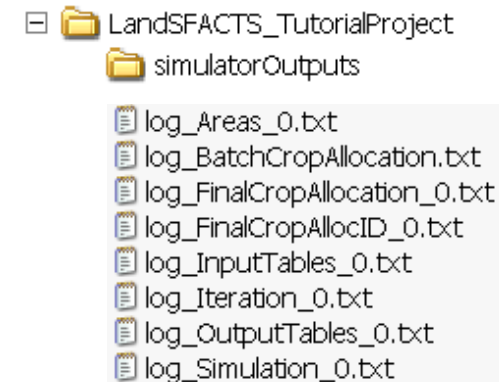
The table displayed below, shows the results of the latest simulation.

The simulation generated crop allocations for all 5 year(s).

Simulation year (SimYear)	Field number (PlgID)	Crop name (Cname)	Crop type (TypeDef)	Crop id (CID)
0	1	Wheat	Winter crop	2
0	2	OSR	Convention...	3
0	3	Barley	Winter crop	5
0	4	Wheat	Winter crop	2
0	5	Wheat	Winter crop	2
0	6	Wheat	Winter crop	2
0	7	Fallow	Permanent ...	1
0	8	Fallow	Permanent ...	1
0	9	Fallow	Permanent ...	1
0	10	Fallow	Permanent ...	1
1	1	OSR	Convention...	3
1	2	Barley	Winter crop	5

Save results as a dbf Close

d. The text files results are saved in the “simulatorOutputs” folder within the project folder.



e. The obtained simulation does take in account all the constraints, except the “yearly crop proportion”.  
Cf. next page for its inclusion.

- f. To run the simulation with all the constraints:
- in “Simulation / Sub-sets”, set the yearly crop proportion to simulate (1)

Simulation Sub-sets

Constraints to simulate

Enter 1 or 0 in the To simulate column.

Id	condition name	condition type	To simulate?
5	GM-conv OSR	spatial const...	1
1	LandCapability	Land capabil...	1
6	YCP_30p_O...	yearly crop ...	1
3	conv after G...	temporal co...	1
4	conv after G...	temporal co...	1
2	winter cereals	temporal co...	1

Set To simulate ?

Fields to simulate

☒ Whole landscape

☐ Sub-sets of the landscape 2-high capability soils

The subsets of fields available are limited by the constraints to simulate.

Ok Cancel

- In “Simulation / Simulation set up”, set the Batch value to “100”.

Batch number of simulations setup

Number of simulations in a batch : 100

- g. Run the simulation.

- h. When the simulations are finished, in the “simulatorOutputs” folder, open “log\_BatchCropAllocation.txt”.

The BatchSimReport table reports which simulations were successful (FailedSim = 0). In the example below, Simulation 5,6,9,16,22 were successful. Their crop allocations are saved in the folder as “log\_FinalCropAllocation\_x.txt”

BatchSimReport:						
BatchID:	FailedSim	Year	Nbiteration	NbCondFz	Penalty	Seed
0	1	1	1102	0	0	95414082
1	1	1	1104	0	0	1.94E+09
2	1	1	1111	0	0	6.33E+08
3	1	1	1101	0	0	1.54E+09
4	1	2	1122	0	0	1.26E+09
5	0	0	9	0	0	1.2E+09
6	0	0	30	0	0	5.67E+08
7	1	2	1108	0	0	1.27E+09
8	1	1	1118	0	0	1.61E+09
9	0	0	14	0	0	4.58E+08
10	1	1	1109	0	0	6.42E+08
11	1	1	1118	0	0	1.64E+09
12	1	1	1111	0	0	1.99E+09
13	1	1	1100	0	0	3.98E+08
14	1	1	1101	0	0	1.44E+09
15	1	2	1104	0	0	42886222
16	0	0	19	0	0	98011762
17	1	1	1114	0	0	1.21E+09
18	1	1	1109	0	0	1.01E+09
19	1	1	1100	0	0	1.61E+09
20	1	1	1103	0	0	1.03E+09
21	1	1	1100	0	0	1.38E+09
22	0	0	26	0	0	1.41E+09
23	1	1	1100	0	0	9.34E+08