StandsSIM

Forest Managment Approaches (FMA) Prescriptions and more

Forest Models Course

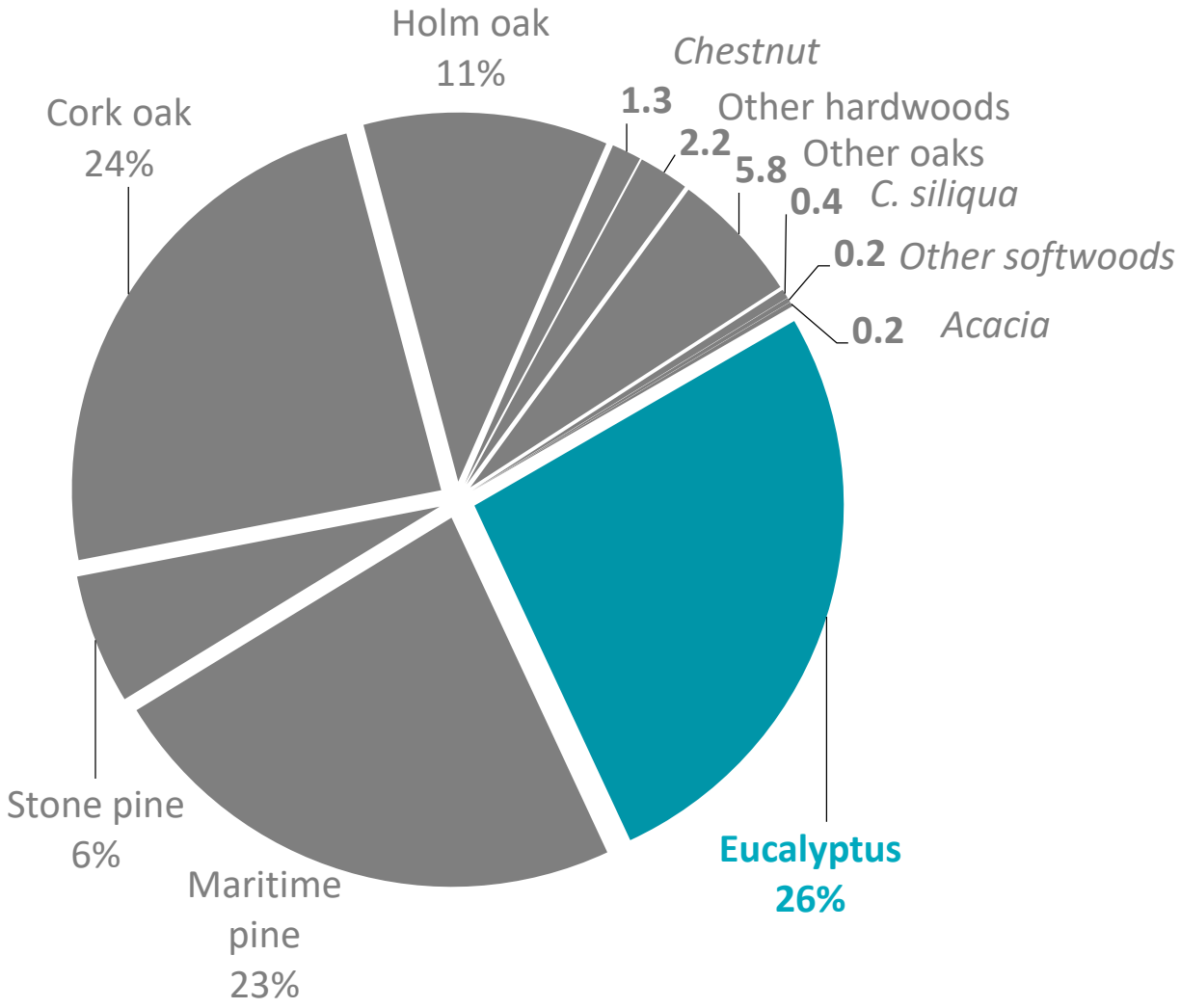
Forest Models and Simulators to Support Sustainable Forest Management in a Global Change Context

2019-2020

Summary

- Tree species in Portugal
- sIMfLOR platform and its forest simulators
  - StandsSIM.md structure
  - StandsSIM.md inputs
    - FMA & Prescription concepts
- Running StandsSIM.md in sIMfLOR
  - Generating and importing inputs
  - Running StandsSIM
  - The outputs
  - Exercises

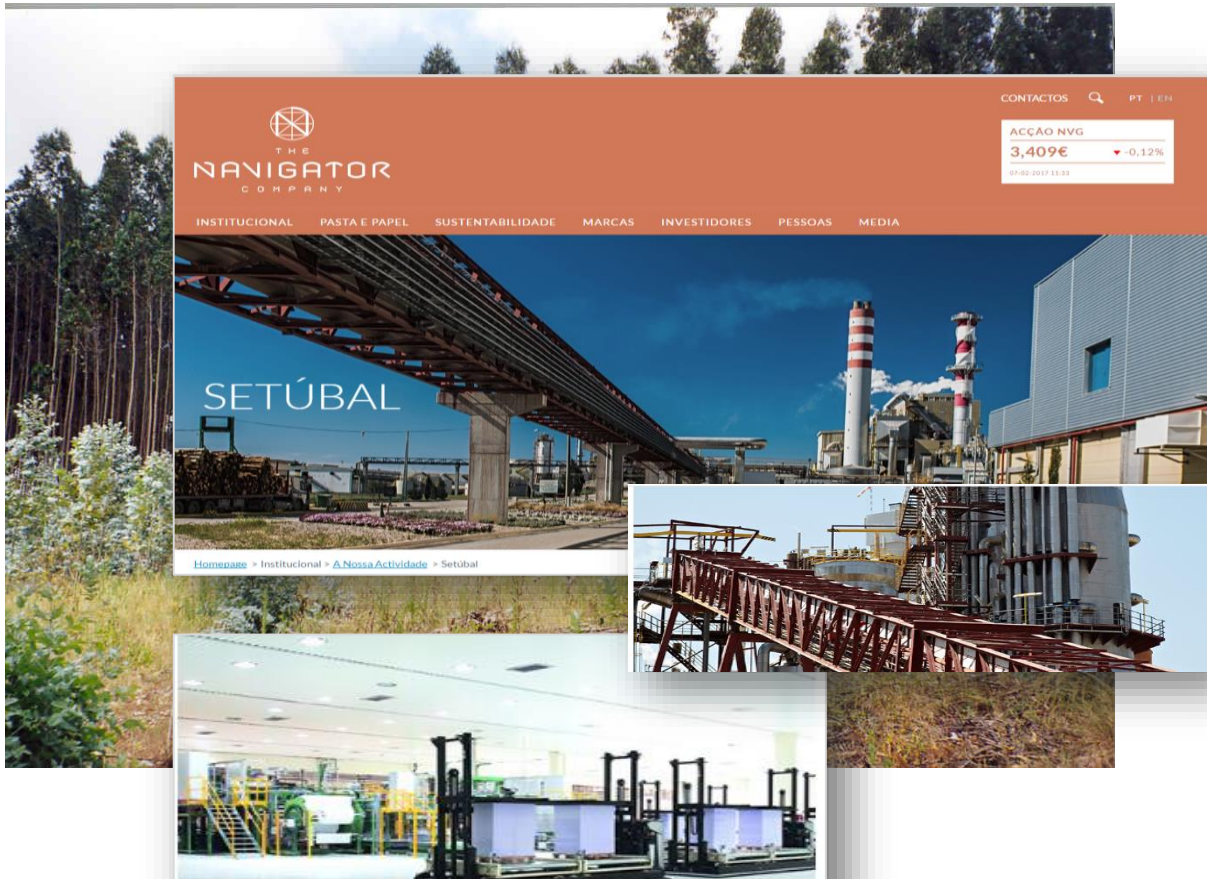
Tree species in Portugal



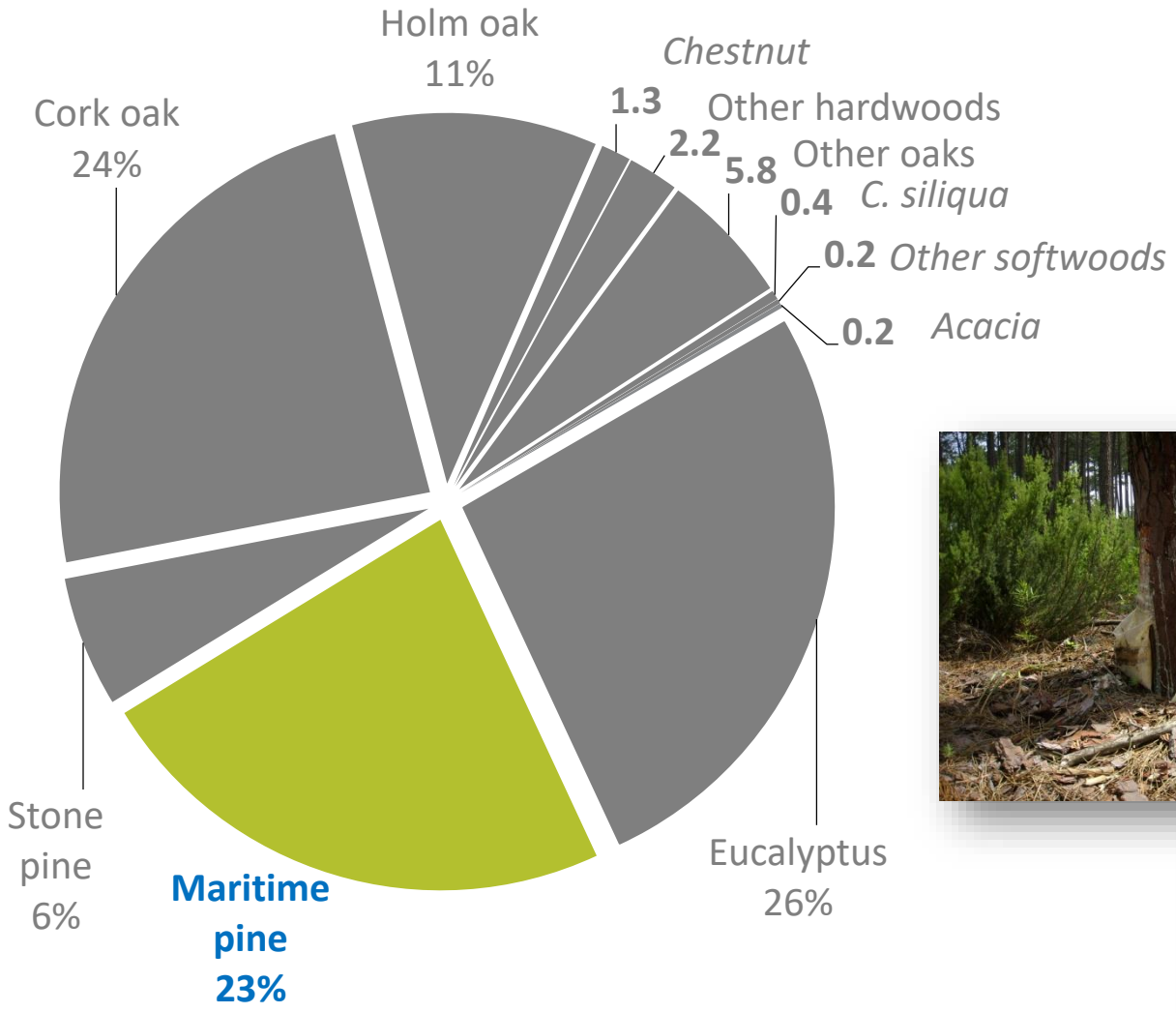
Management

Pulp :

1 plantation (1250 trees ha^{-1}) + 2 coppices
harvest around 10 yr



Tree species in Portugal



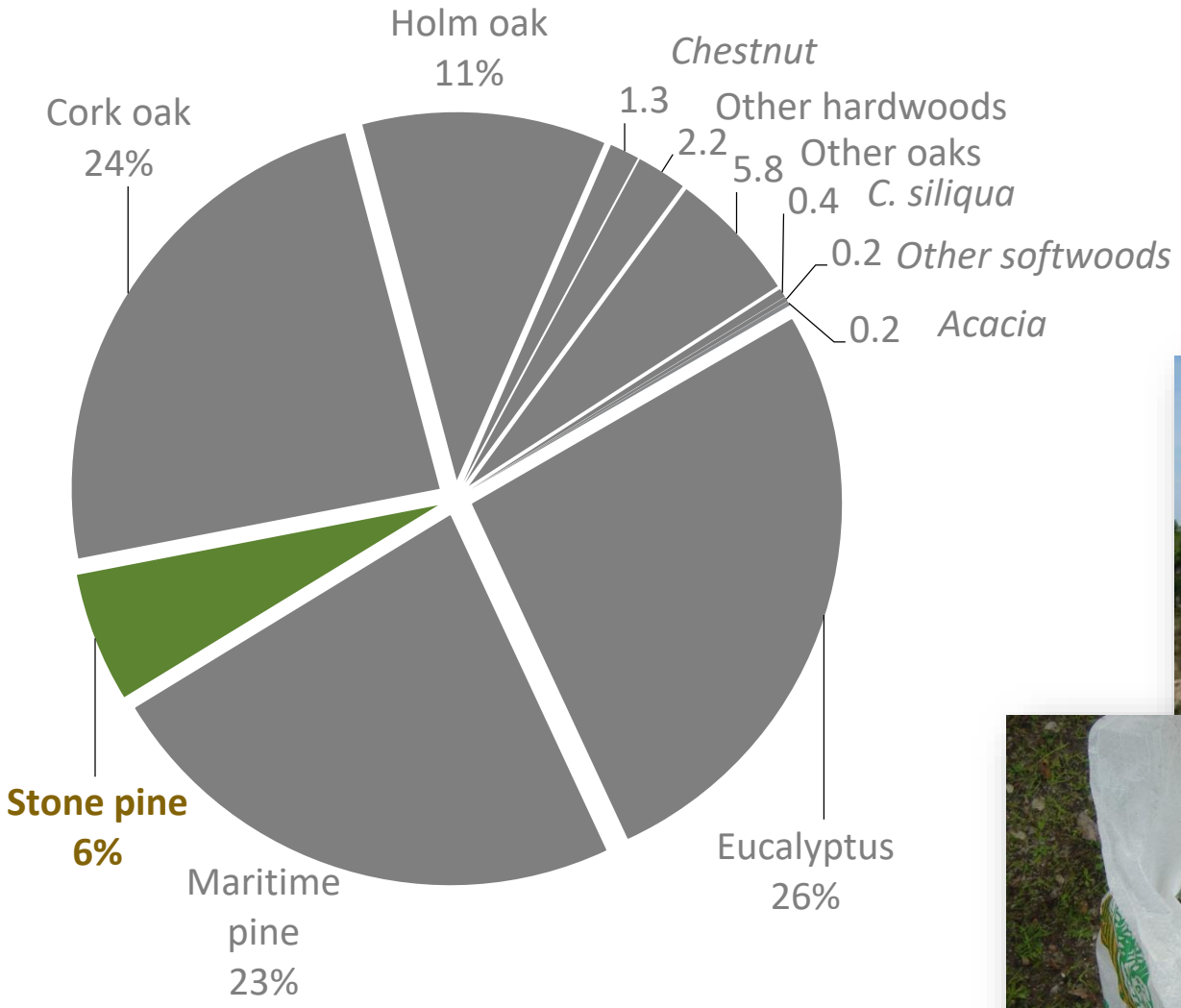
Management

Wood (and resin) :

1 plantation (1667 trees ha^{-1})

harvest around 35 yr

Tree species in Portugal



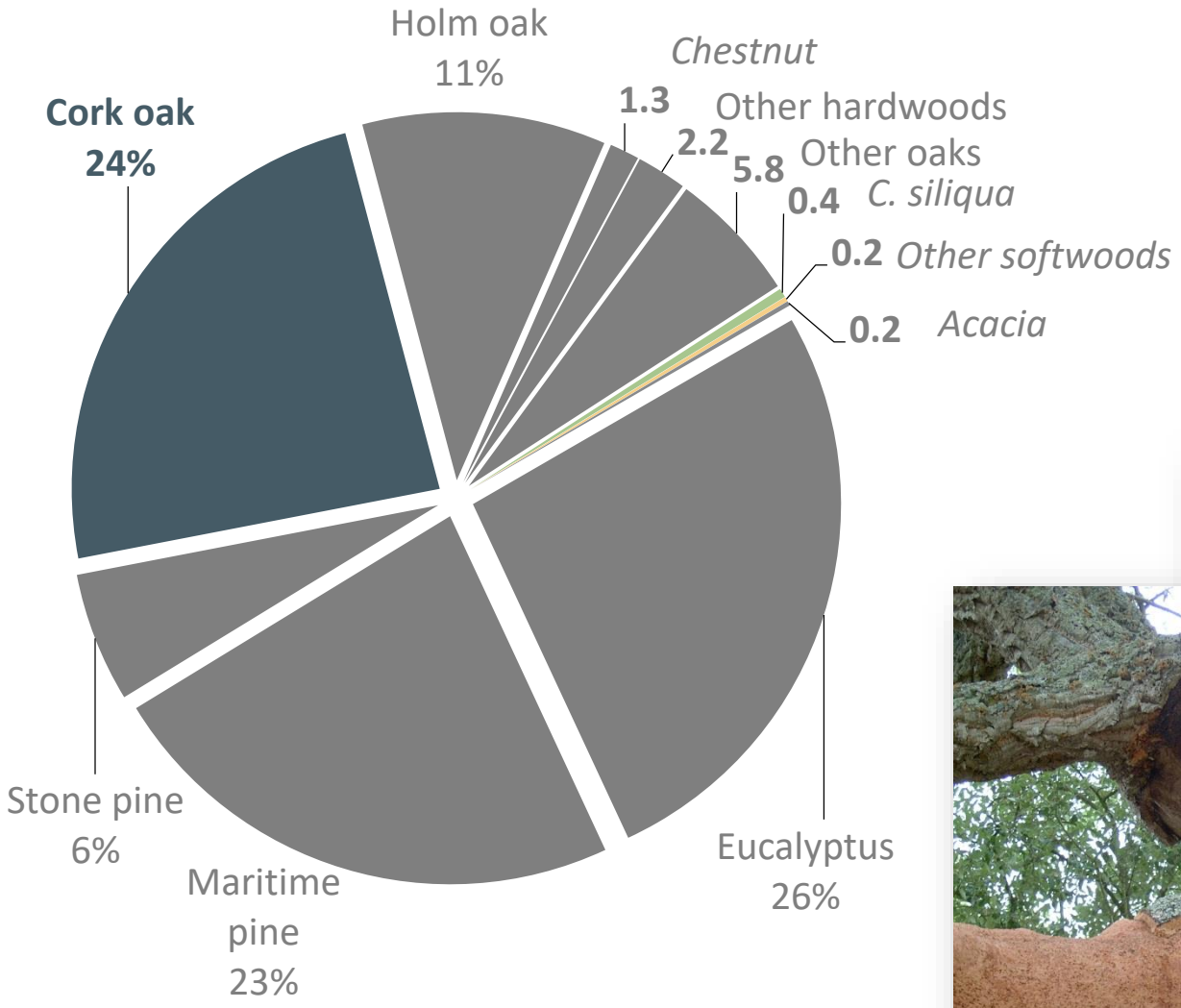
Management

Pine nuts

Plantations

Usually grafted

Tree species in Portugal

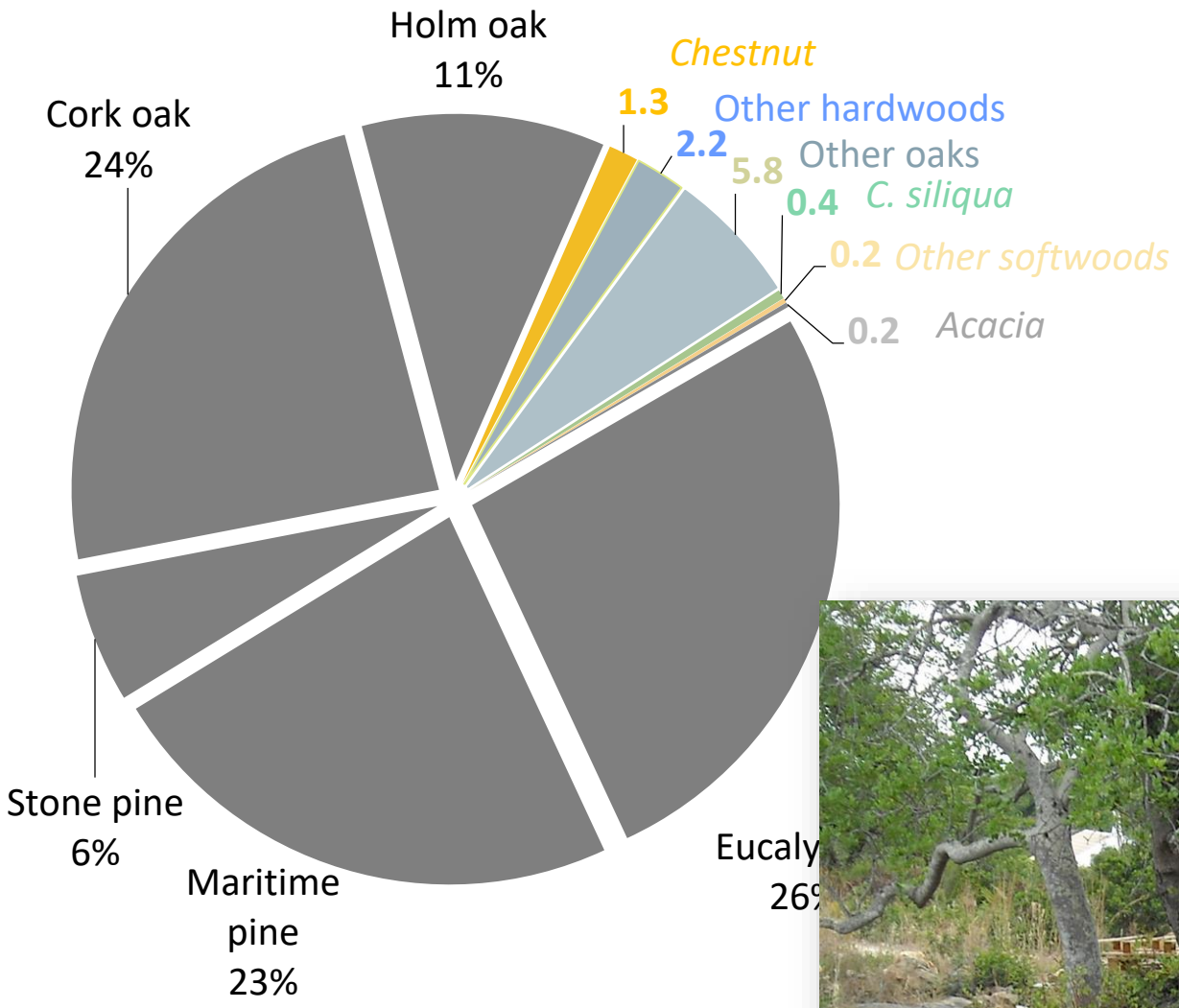


Management

Cork:

uneven aged
Debarking every 9 yrs
difficult to regenerate
forbidden to harvest

Tree species in Portugal



Management

Tree species in sIMfLOR

26.4 %

23.2 %

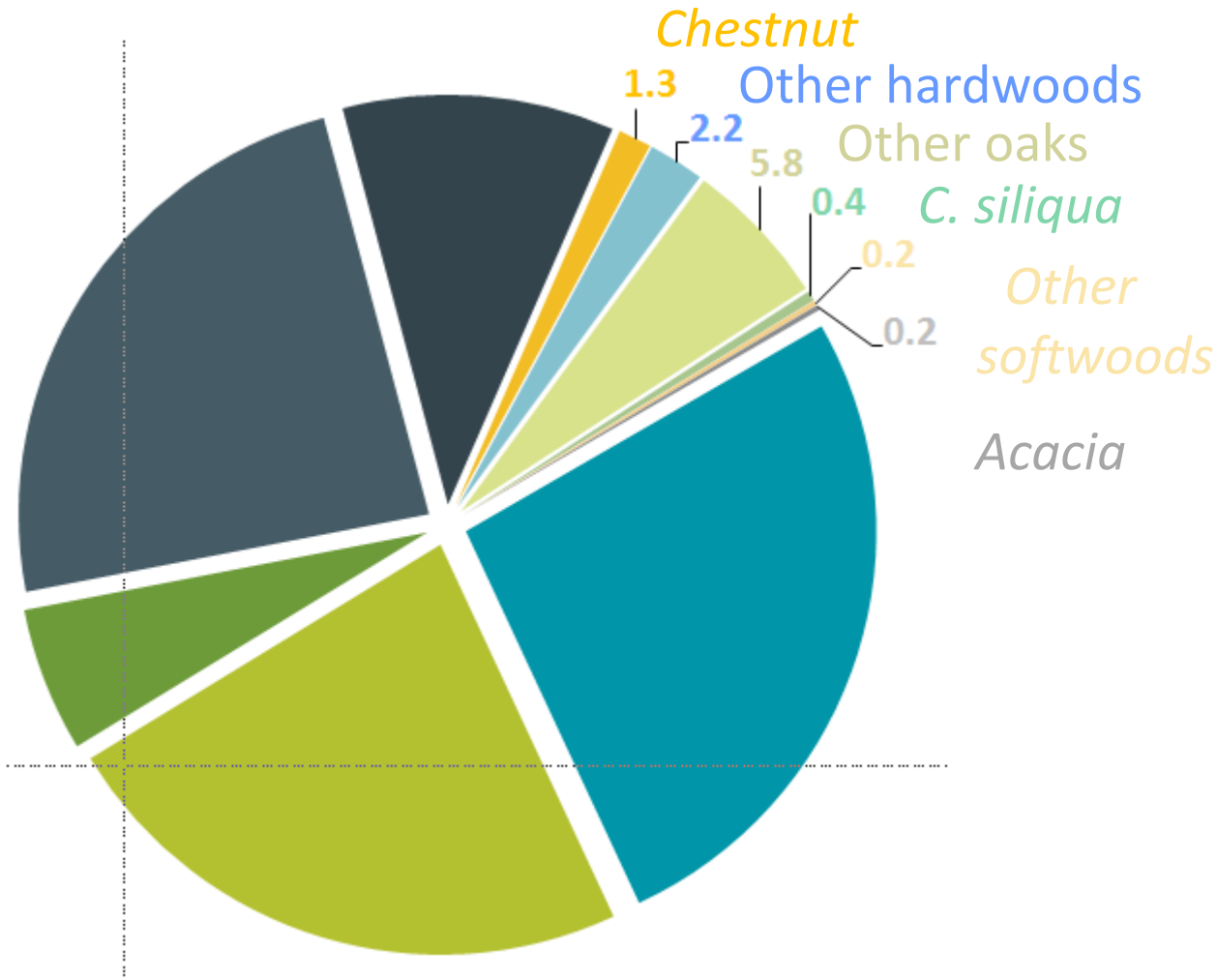
5.7 %

23.9 + 10.7 %

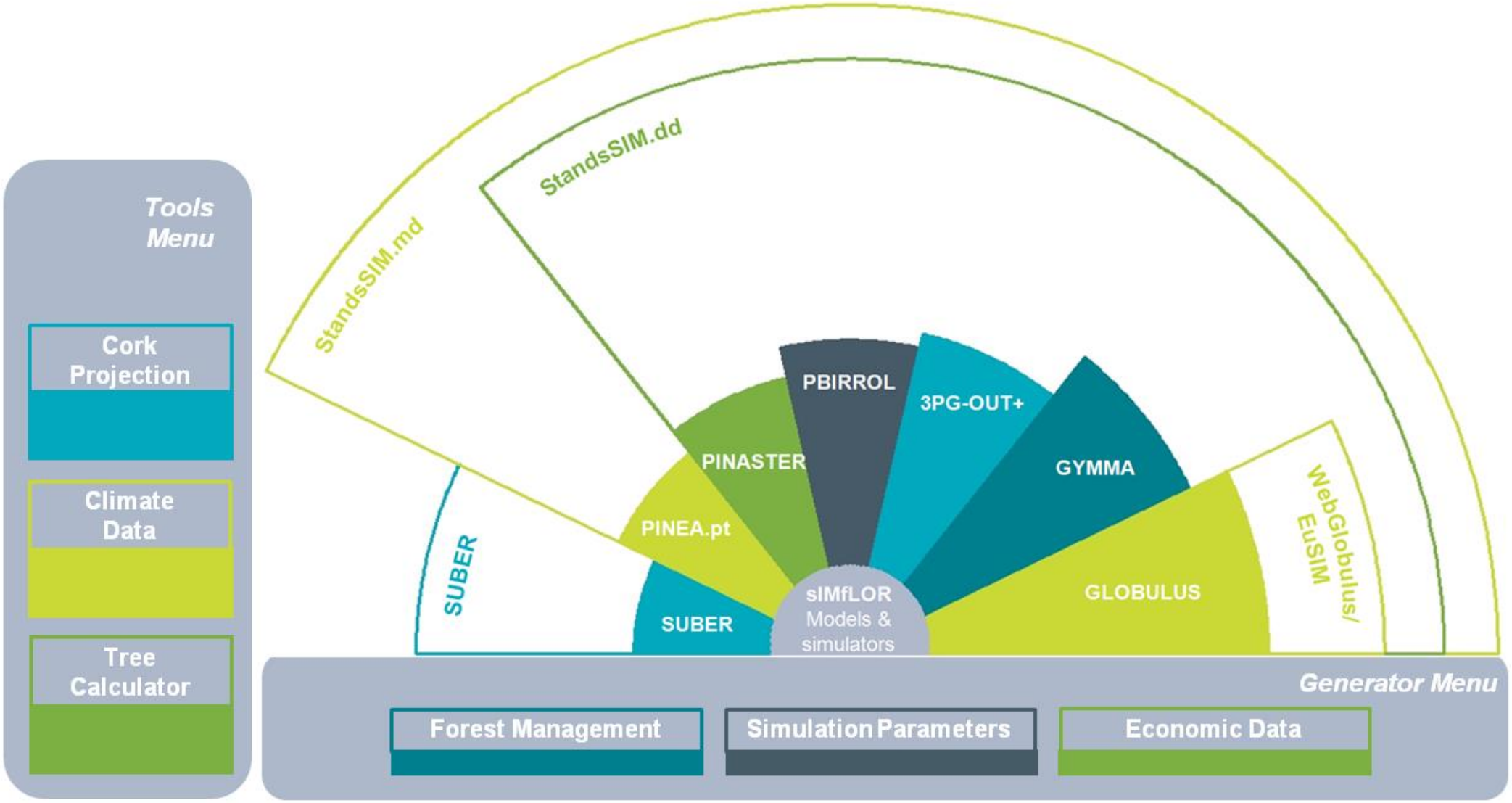
1.3 %

+

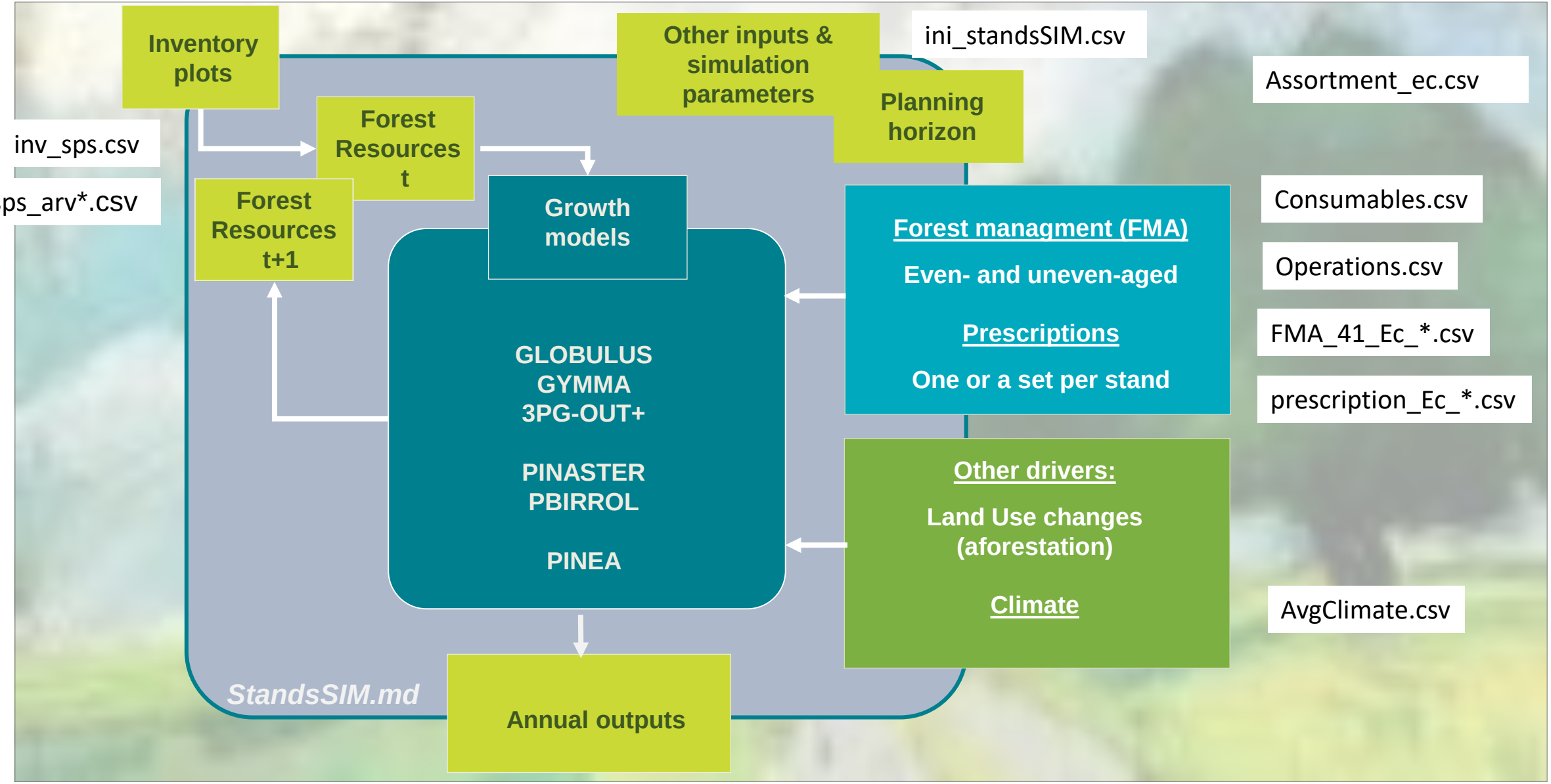
91.2 %



sIMfLOR platform and its forest simulators



StandsSIM.md structure



Simulator inputs

- **Stand input:**

  Data from forest inventory and site characterization

- **Forest management approach (FMA):**

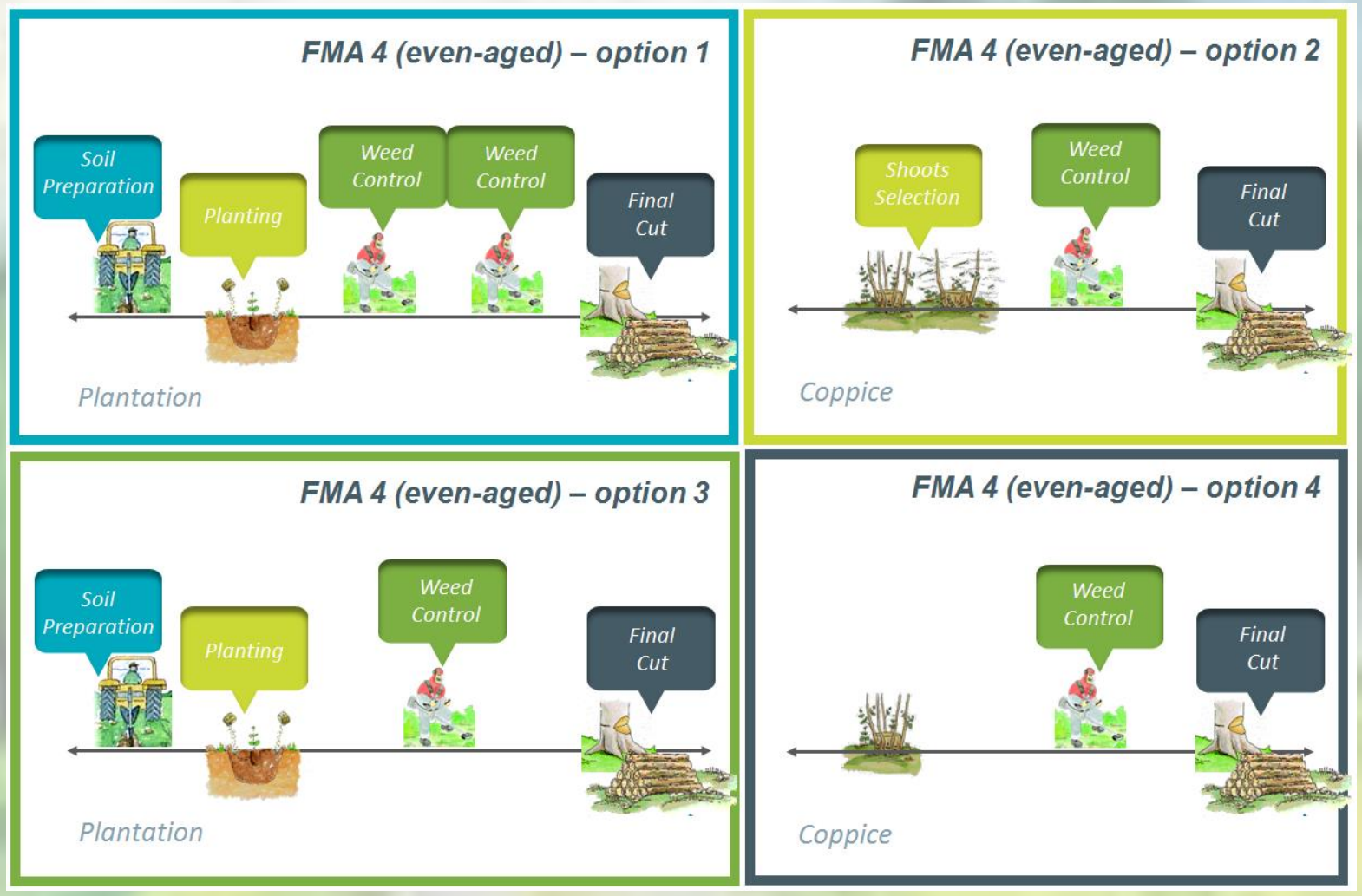
  Implementation of a silvicultural system, expressed by a sequence of silvicultural operations during a rotation

Forest management approach (FMA):

Describes silvicultural operations from stand regeneration up to final cut

Must be defined up to the maximum harvest age (even-aged stands) or for the rotation period (uneven-aged stands)

Several options can be considered under each FMA type, where options differ in terms of sets of operations considered and/or their distribution over time



Simulator inputs

- **Stand input:**

  Data from forest inventory and site characterization

- **Forest management approach (FMA):**

  Implementation of a silvicultural systems, expressed by a sequence of silvicultural operations during a rotation

- **Prescription:**

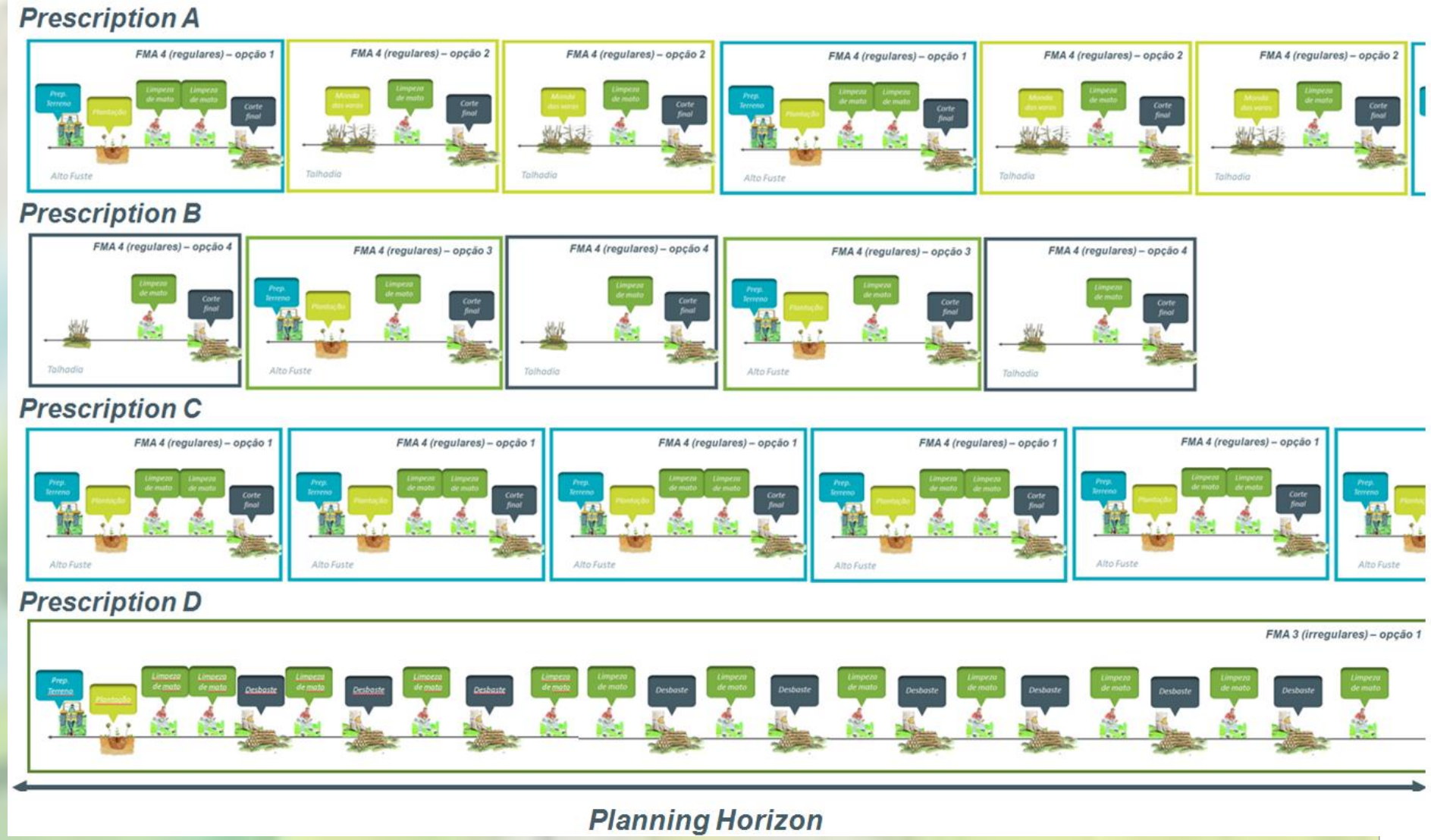
  Sequence of FMAs and transition between FMAs that are applied to a stand during the projection period/planning horizon

Prescription:

The set of cycles from regeneration until final cut can be built of:

Sequence of different FMAs/options (Prescriptions A & B)

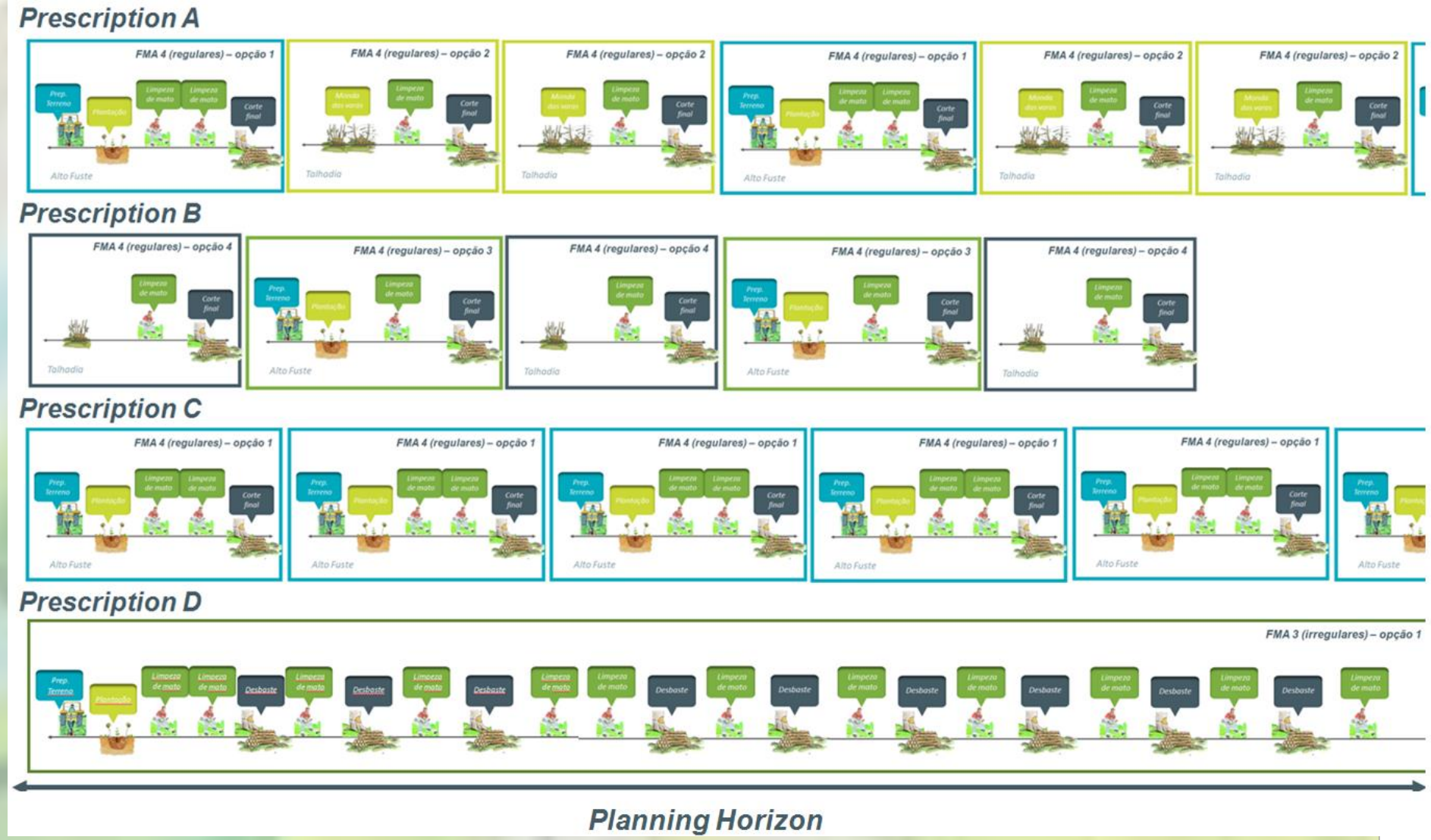
Sequence of the same FMA/option (Prescription C)



Prescription:

can have a single cycle if the FMA is defined for a number of years greater than the planning horizon (*Prescription D*)

Incomplete prescriptions will stop the stand from being simulated (*Prescription B*)



Simulator inputs

- **Stand input:**

  Data from forest inventory and site characterization

- **Forest management approach (FMA):**

  Implementation of a silvicultural systems, expressed by a sequence of silvicultural operations during a rotation

- **Prescription:**

  Sequence of FMAs and transition between FMAs that are applied to a stand during the projection period

- **Scenario:**

  Conditions present during the projection period (climate, forest policy measures, management alternatives, etc)

Scenario:

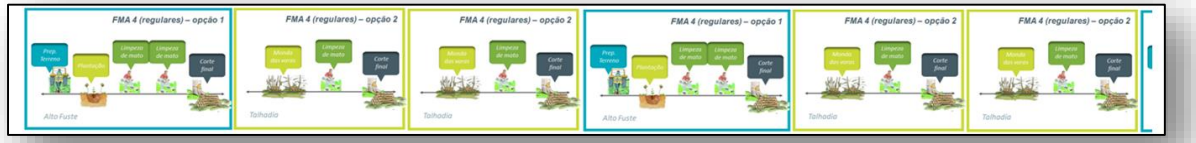
a)

S1: + -

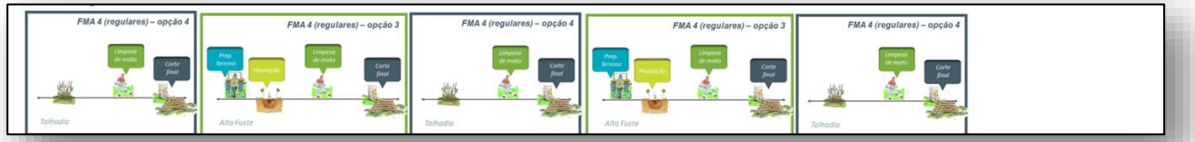
S2: ++ --

b)

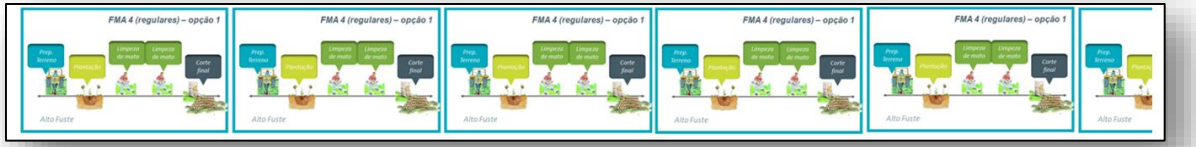
S1:



S2:



S3:



S4:

sIMfLOR platform and FCTools

http://www.isa.ulisboa.pt/cef/forchange/fctools/en/home

sIMfLOR platform and its forest simulators

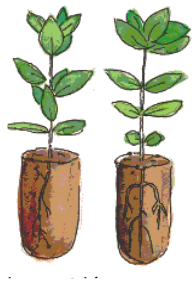
StandsSIM.md

Required inputs

Forest characterization

New stand

(yield table)



Existing Stand

Several Stands

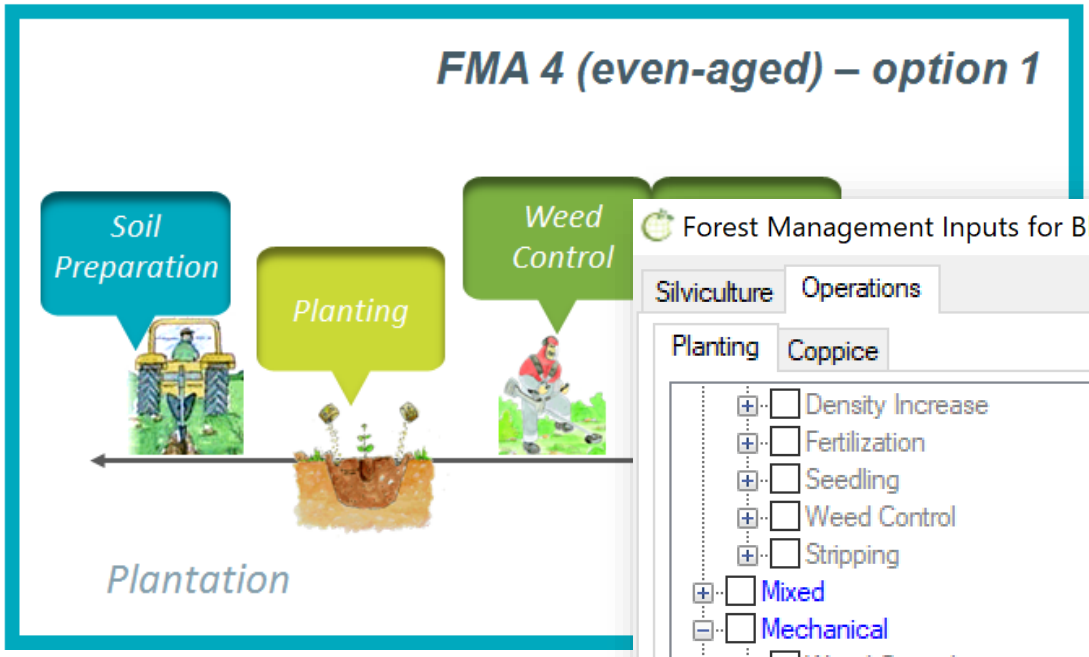
sIMfLOR platform and its forest simulators

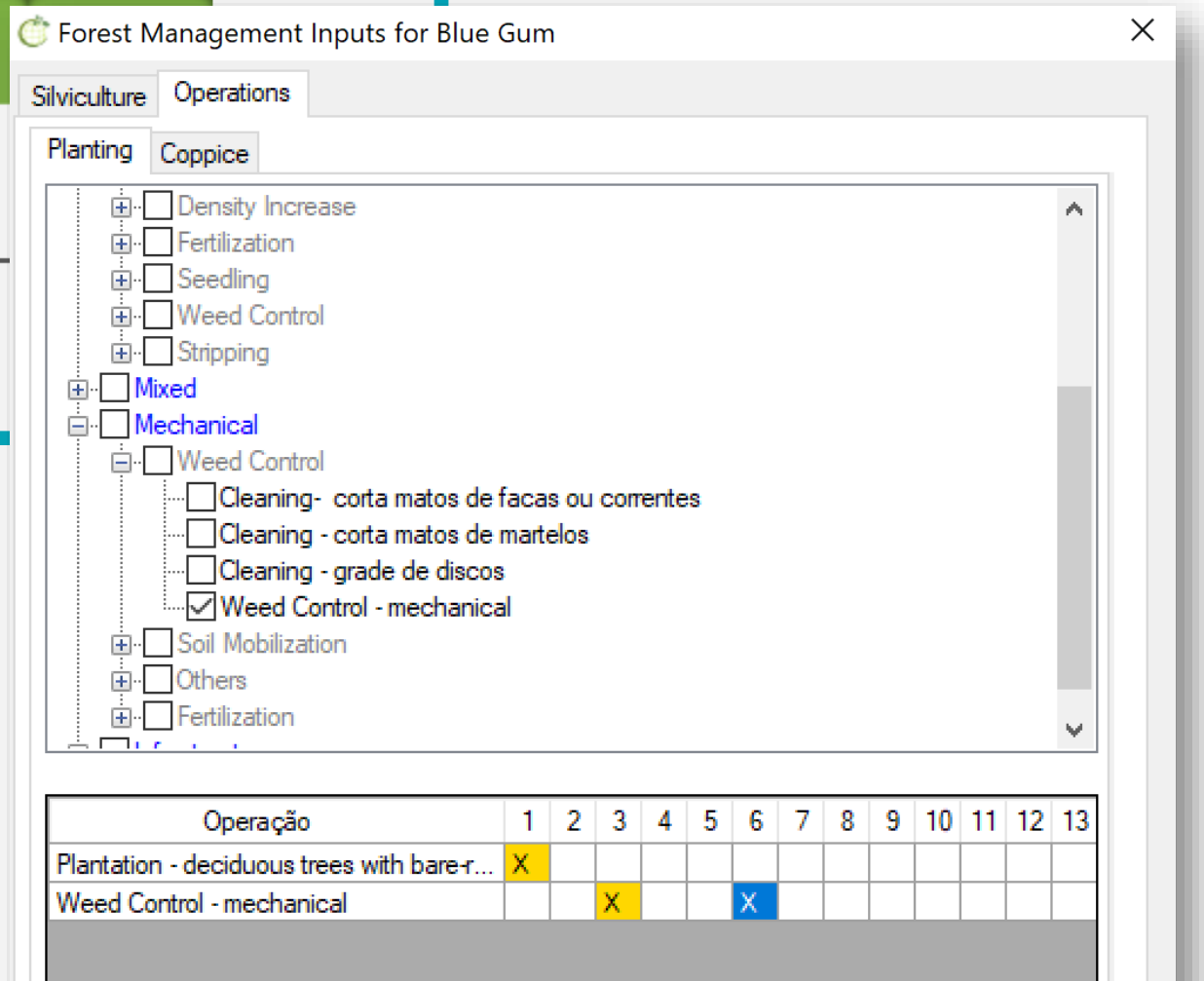
StandsSIM.md

Required inputs

Forest characterization

Forest Management Approaches (FMA)





sIMfLOR platform and its forest simulators

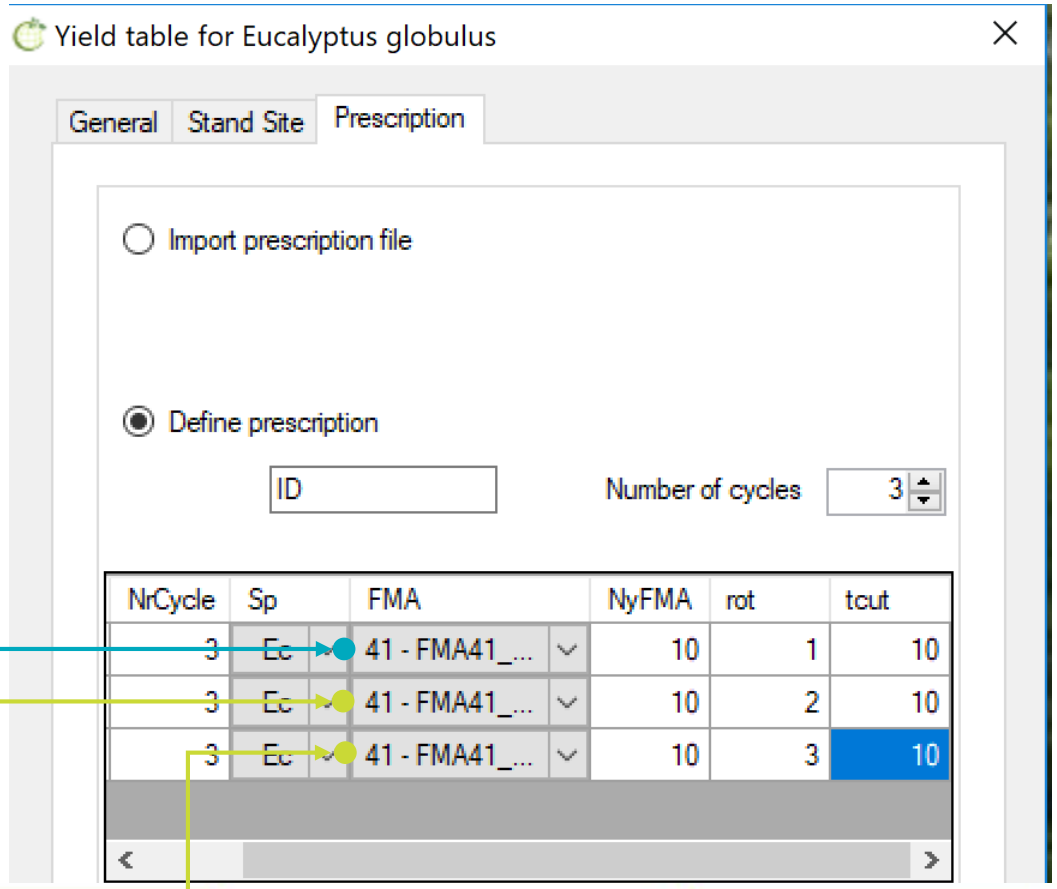
StandsSIM.md

Required inputs

Forest characterization

Forest Management Approaches (FMA)

Prescriptions



Exercises

Eucalypt

Maritime pine

Stone pine

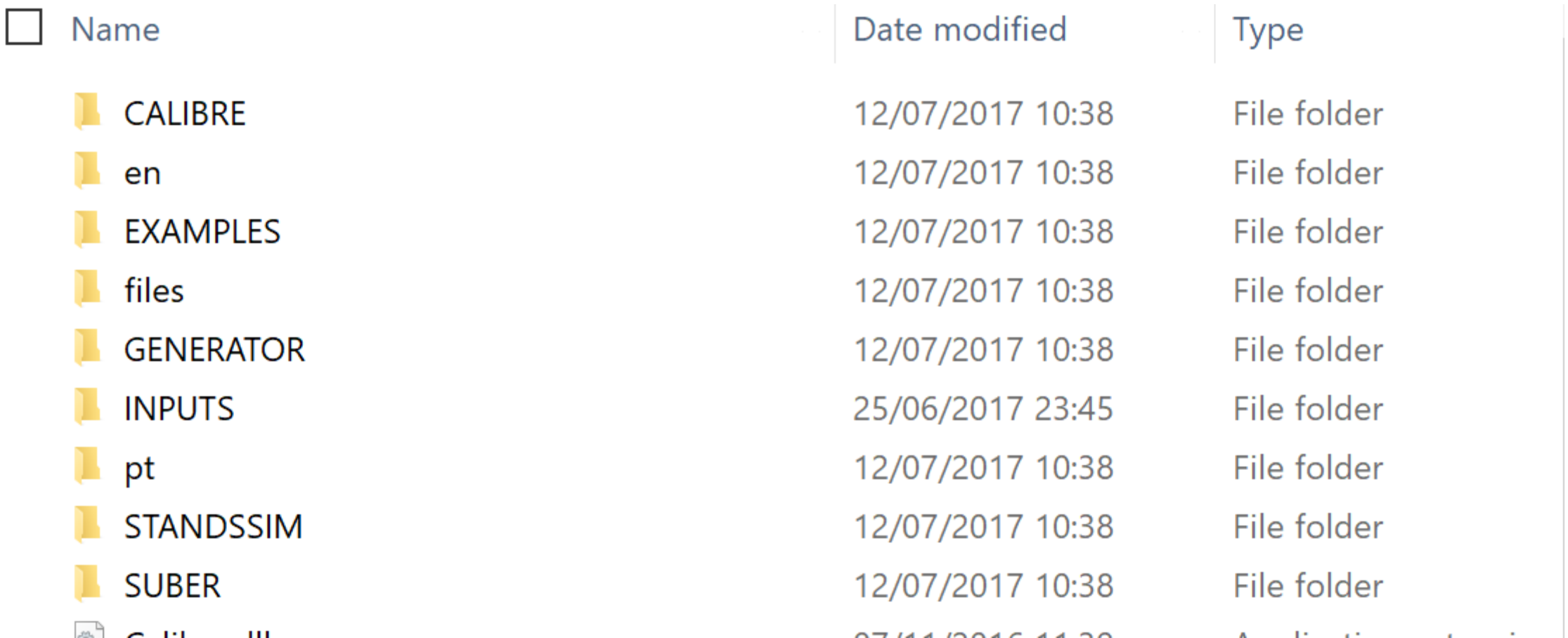
Go to FCTools:
http://www.isa.ulisboa.pt/cef/forchange/fctools/en/home

Register & Download sIMfLOR platform

Regional settings of your computer in English

You have successfully downloaded sIMfLOR

\...\ SIMFLOR_2017



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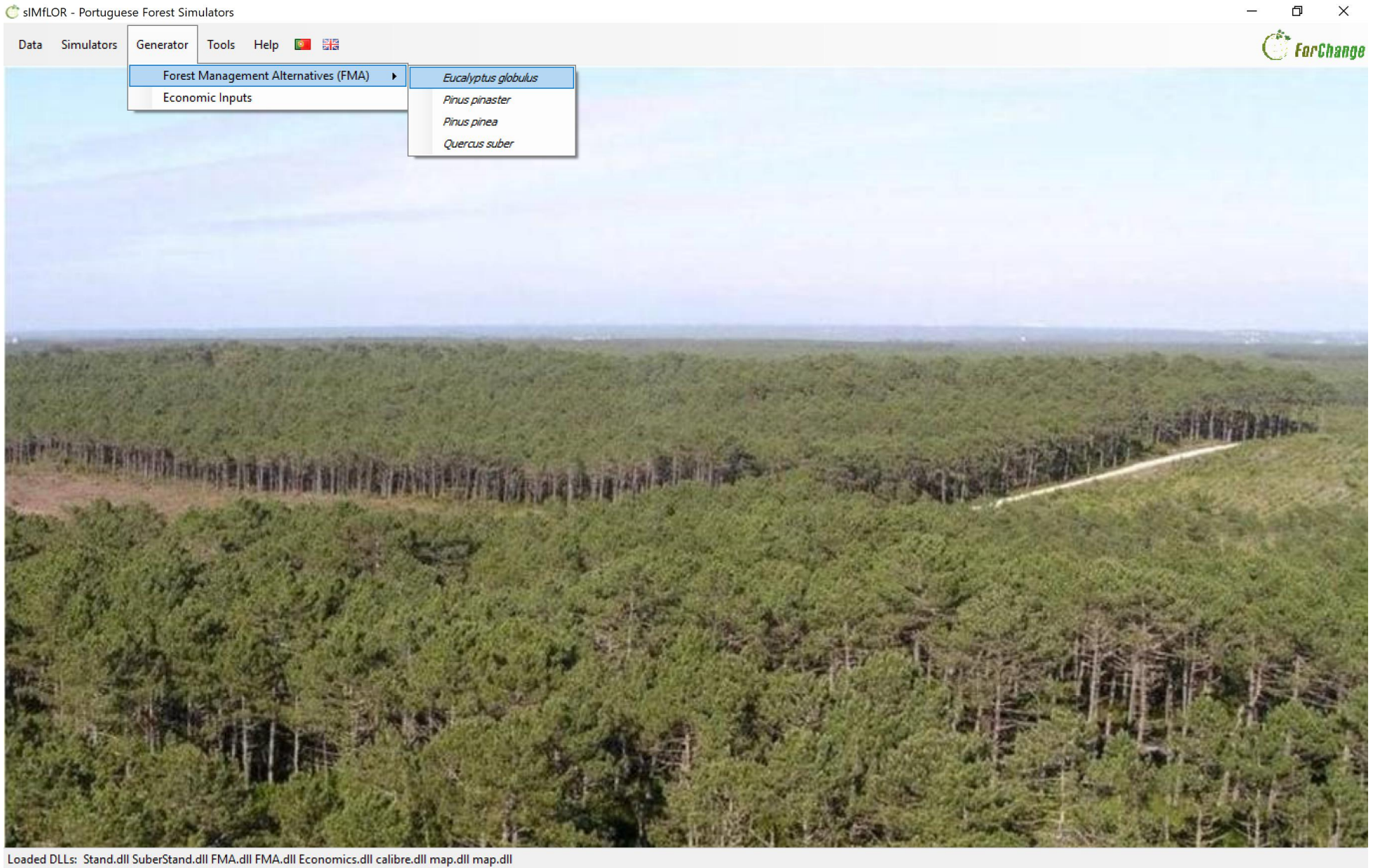
CALIBRE	12/07/2017 10:38	File folder
en	12/07/2017 10:38	File folder
EXAMPLES	12/07/2017 10:38	File folder
files	12/07/2017 10:38	File folder
GENERATOR	12/07/2017 10:38	File folder
INPUTS	25/06/2017 23:45	File folder
pt	12/07/2017 10:38	File folder
STANDSSIM	12/07/2017 10:38	File folder
SUBER	12/07/2017 10:38	File folder

You have successfully downloaded sIMfLOR

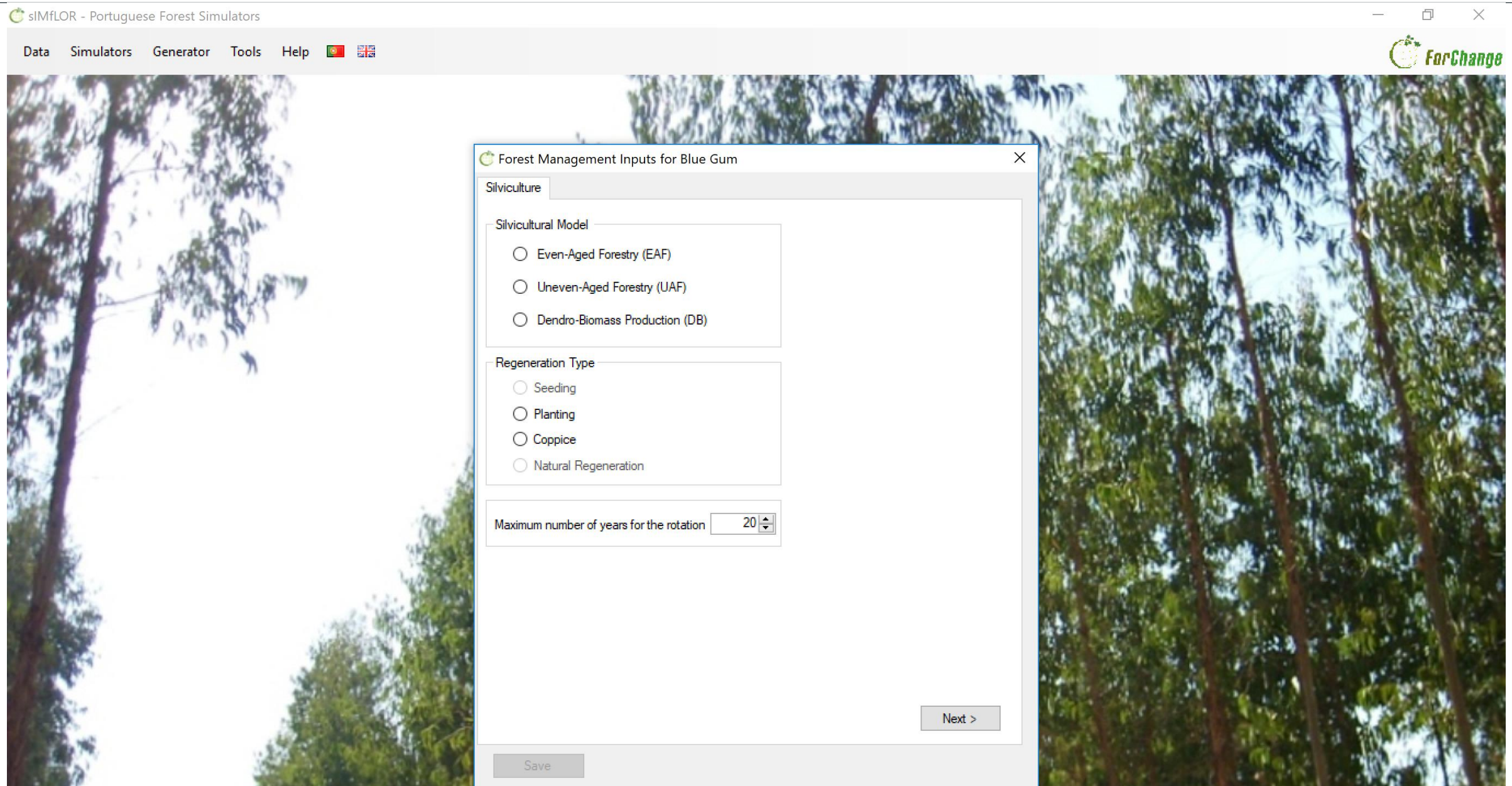
\...\ SIMFLOR_2017

You have successfully downloaded sIMfLOR

Let’s define an FMA



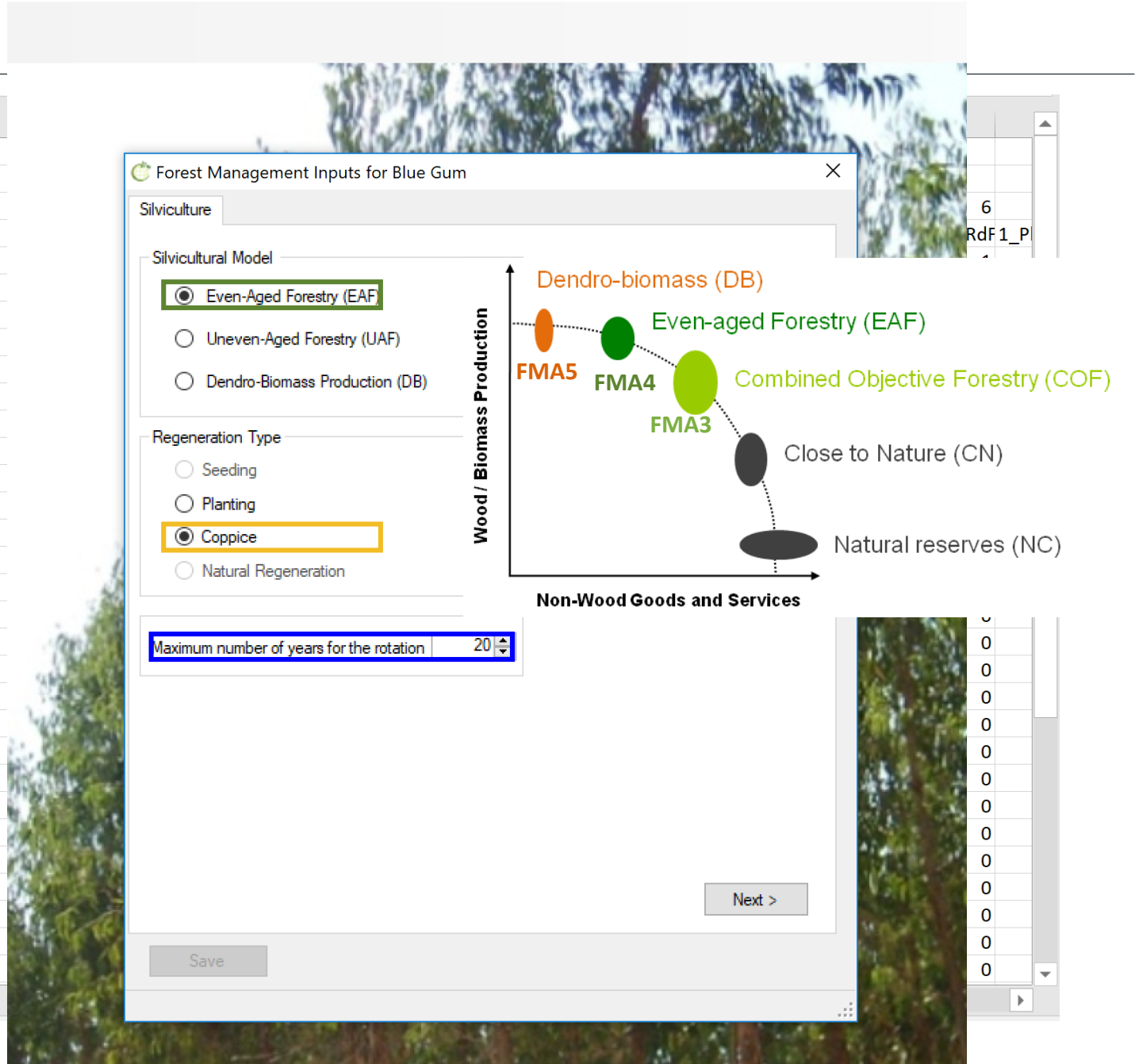
Let’s define an FMA



FMA file

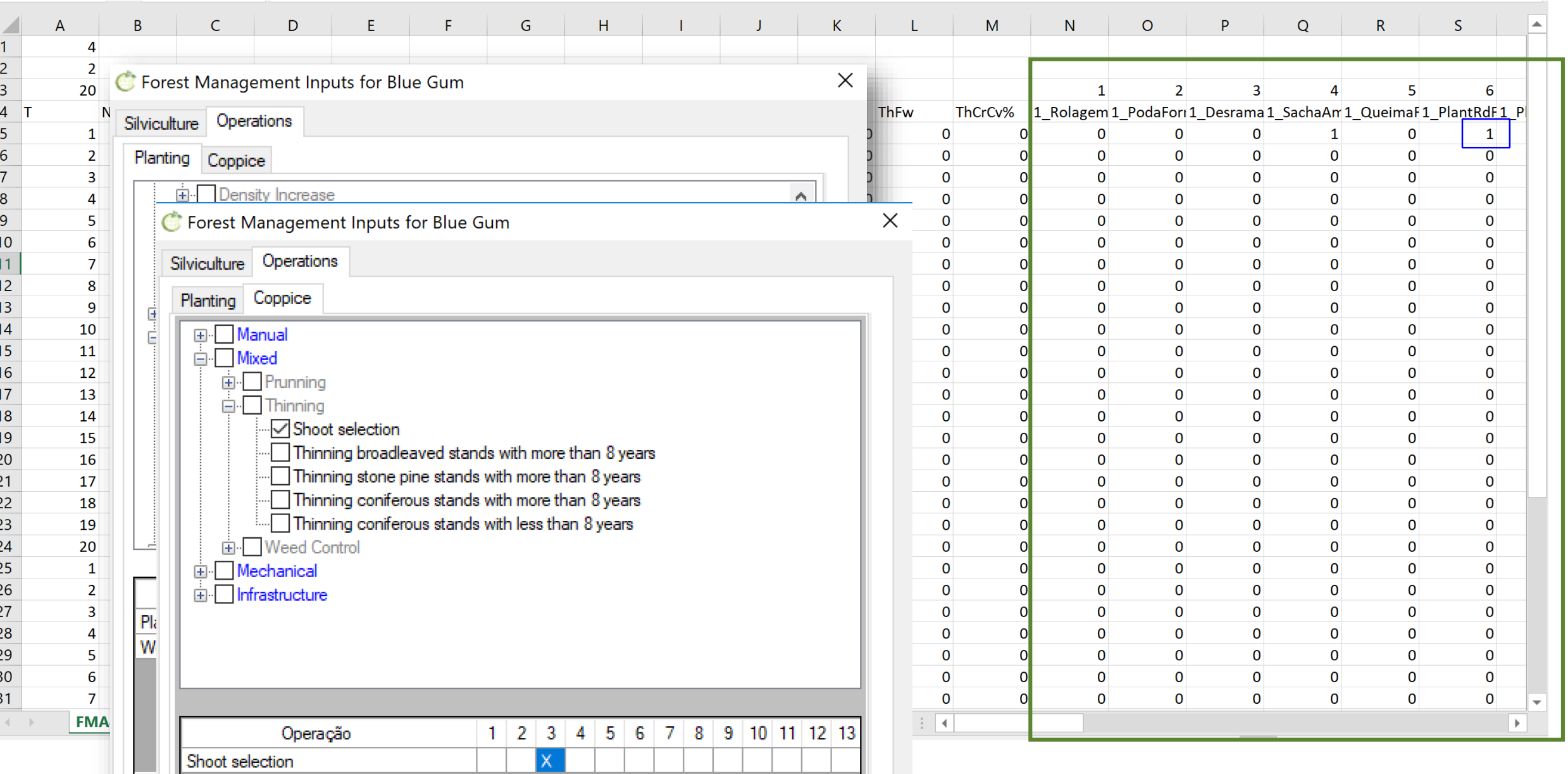
	A	B	C	D	E	F	G	H	I
1	4	FMA							
2	2	Planting and Coppice							
3	20	Maximum rotation age							
4	T	Npl	Mortality	BeatUp	ShootSel	DensIncr	StripIncr	Prunn	Th_type
5	1	1250	0	15	0	0	0	0	
6	2	0	0	0	0	0	0	0	
7	3	0	0	0	0	0	0	0	
8	4	0	0	0	0	0	0	0	
9	5	0	0	0	0	0	0	0	
10	6	0	0	0	0	0	0	0	
11	7	0	0	0	0	0	0	0	
12	8	0	0	0	0	0	0	0	
13	9	0	0	0	0	0	0	0	
14	10	0	0	0	0	0	0	0	
15	11	0	0	0	0	0	0	0	
16	12	0	0	0	0	0	0	0	
17	13	0	0	0	0	0	0	0	
18	14	0	0	0	0	0	0	0	
19	15	0	0	0	0	0	0	0	
20	16	0	0	0	0	0	0	0	
21	17	0	0	0	0	0	0	0	
22	18	0	0	0	0	0	0	0	
23	19	0	0	0	0	0	0	0	
24	20	0	0	0	0	0	0	0	
25	1	0	0	0	0	0	0	0	
26	2	0	0	0	0	0	0	0	
27	3	0	0	0	1.6	0	0	0	
28	4	0	0	0	0	0	0	0	
29	5	0	0	0	0	0	0	0	
30	6	0	0	0	0	0	0	0	
31	7	0	0	0	0	0	0	0	

FMA41_Ec_Regular



FMA file

Silvicultural operations: matrix (0,1)

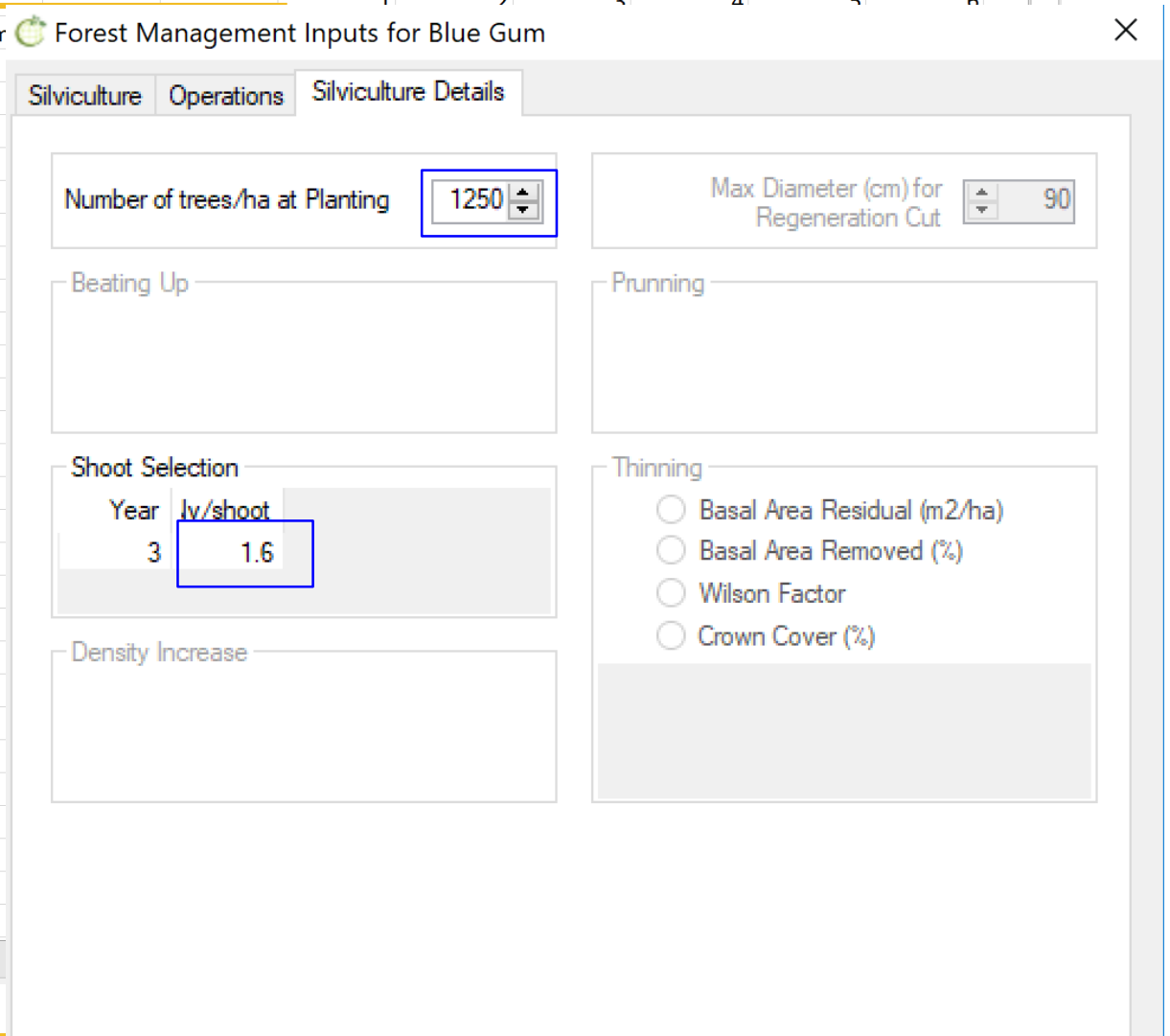


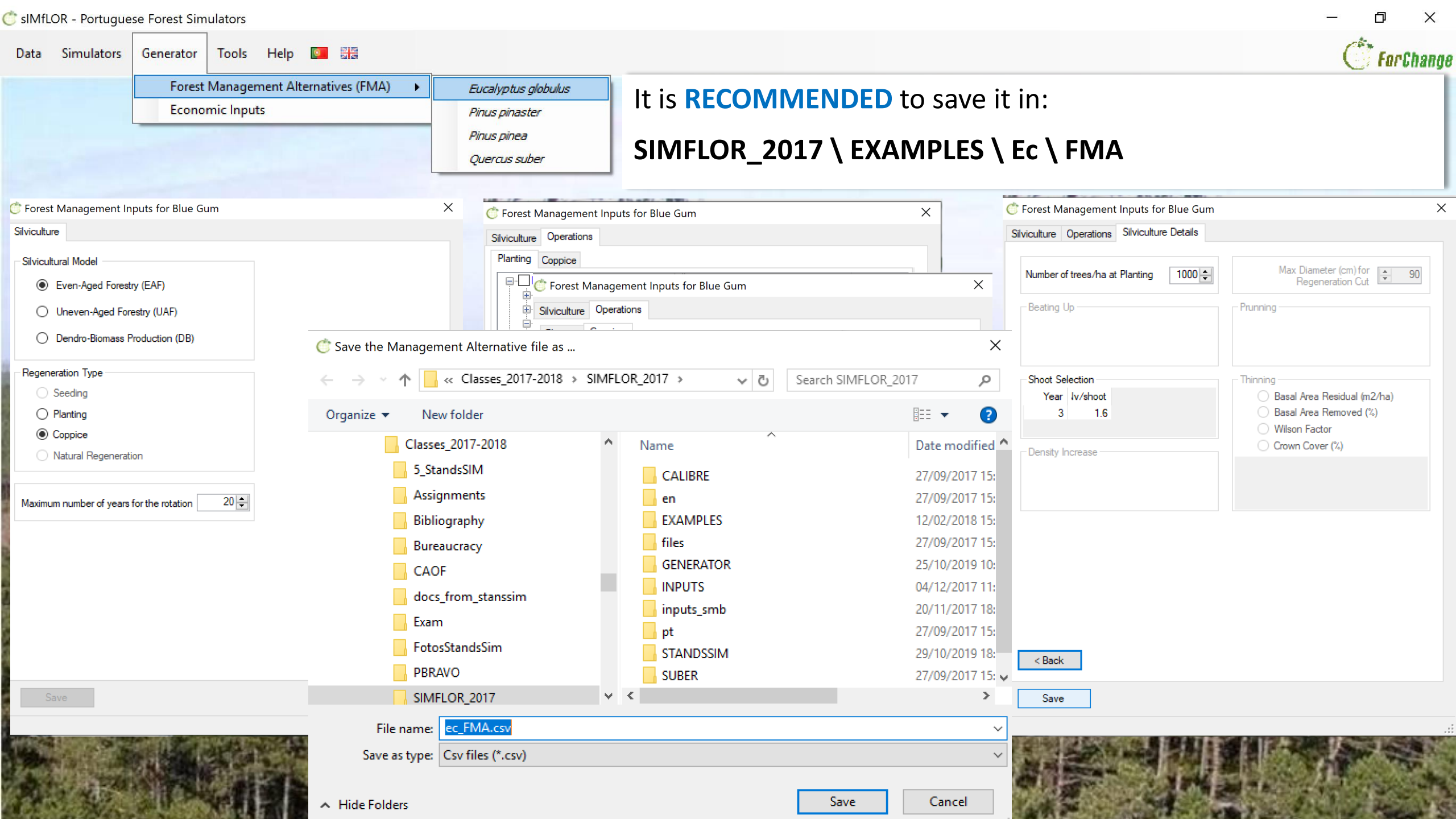
FMA file

Silvicultural operations' details

	A	B	C	D	E	F	G	H	I	J	K
1		4									
2		2									
3		20									
4	T	Npl	Mortality	BeatUp	ShootSel	DensIncr	StripIncr	Prunn	Th_type	ThGres	ThGrem
5	1	1250	0	15	0	0	0	0	0	0	
6	2	0	0	0	0	0	0	0	0	0	
7	3	0	0	0	0	0	0	0	0	0	
8	4	0	0	0	0	0	0	0	0	0	
9	5	0	0	0	0	0	0	0	0	0	
10	6	0	0	0	0	0	0	0	0	0	
11	7	0	0	0	0	0	0	0	0	0	
12	8	0	0	0	0	0	0	0	0	0	
13	9	0	0	0	0	0	0	0	0	0	
14	10	0	0	0	0	0	0	0	0	0	
15	11	0	0	0	0	0	0	0	0	0	
16	12	0	0	0	0	0	0	0	0	0	
17	13	0	0	0	0	0	0	0	0	0	
18	14	0	0	0	0	0	0	0	0	0	
19	15	0	0	0	0	0	0	0	0	0	
20	16	0	0	0	0	0	0	0	0	0	
21	17	0	0	0	0	0	0	0	0	0	
22	18	0	0	0	0	0	0	0	0	0	
23	19	0	0	0	0	0	0	0	0	0	
24	20	0	0	0	0	0	0	0	0	0	
25	1	0	0	0	0	0	0	0	0	0	
26	2	0	0	0	0	0	0	0	0	0	
27	3	0	0	0	1.6	0	0	0	0	0	
28	4	0	0	0	0	0	0	0	0	0	
29	5	0	0	0	0	0	0	0	0	0	
30	6	0	0	0	0	0	0	0	0	0	
31	7	0	0	0	0	0	0	0	0	0	

FMA41_Ec_Regular




sIMfLOR - Portuguese Forest Simulators
Data
Simulators
Generator
Tools
Help
ForChange
Forest Management Alternatives (FMA)
Economic Inputs
Eucalyptus globulus
Pinus pinaster
Pinus pinea
Quercus suber
It is RECOMMENDED to save it in:
SIMFLOR_2017 \ EXAMPLES \ Ec \ FMA
Forest Management Inputs for Blue Gum
Silviculture
Silvicultural Model
Even-Aged Forestry (EAF)
Uneven-Aged Forestry (UAF)
Dendro-Biomass Production (DB)
Regeneration Type
Seeding
Planting
Coppice
Natural Regeneration
Maximum number of years for the rotation
20
Save
Operations
Planting
Coppice
Save the Management Alternative file as ...
Classes_2017-2018 › SIMFLOR_2017
Search SIMFLOR_2017
Organize
New folder
Name
Date modified
CALIBRE
en
EXAMPLES
files
GENERATOR
INPUTS
inputs_smb
pt
STANDSSIM
SUBER
Classes_2017-2018
5_StandsSIM
Assignments
Bibliography
Bureaucracy
CAOF
docs_from_stanssim
Exam
FotosStandsSim
PBRAVO
SIMFLOR_2017
File name:
ec_FMA.csv
Save as type:
Csv files (*.csv)
Hide Folders
Save
Cancel
Silviculture Details
Number of trees/ha at Planting
1000
Max Diameter (cm) for Regeneration Cut
90
Beating Up
Prunning
Shoot Selection
Year
Iv/shoot
3
1.6
Thinning
Basal Area Residual (m2/ha)
Basal Area Removed (%)
Wilson Factor
Crown Cover (%)
Density Increase
< Back
Save

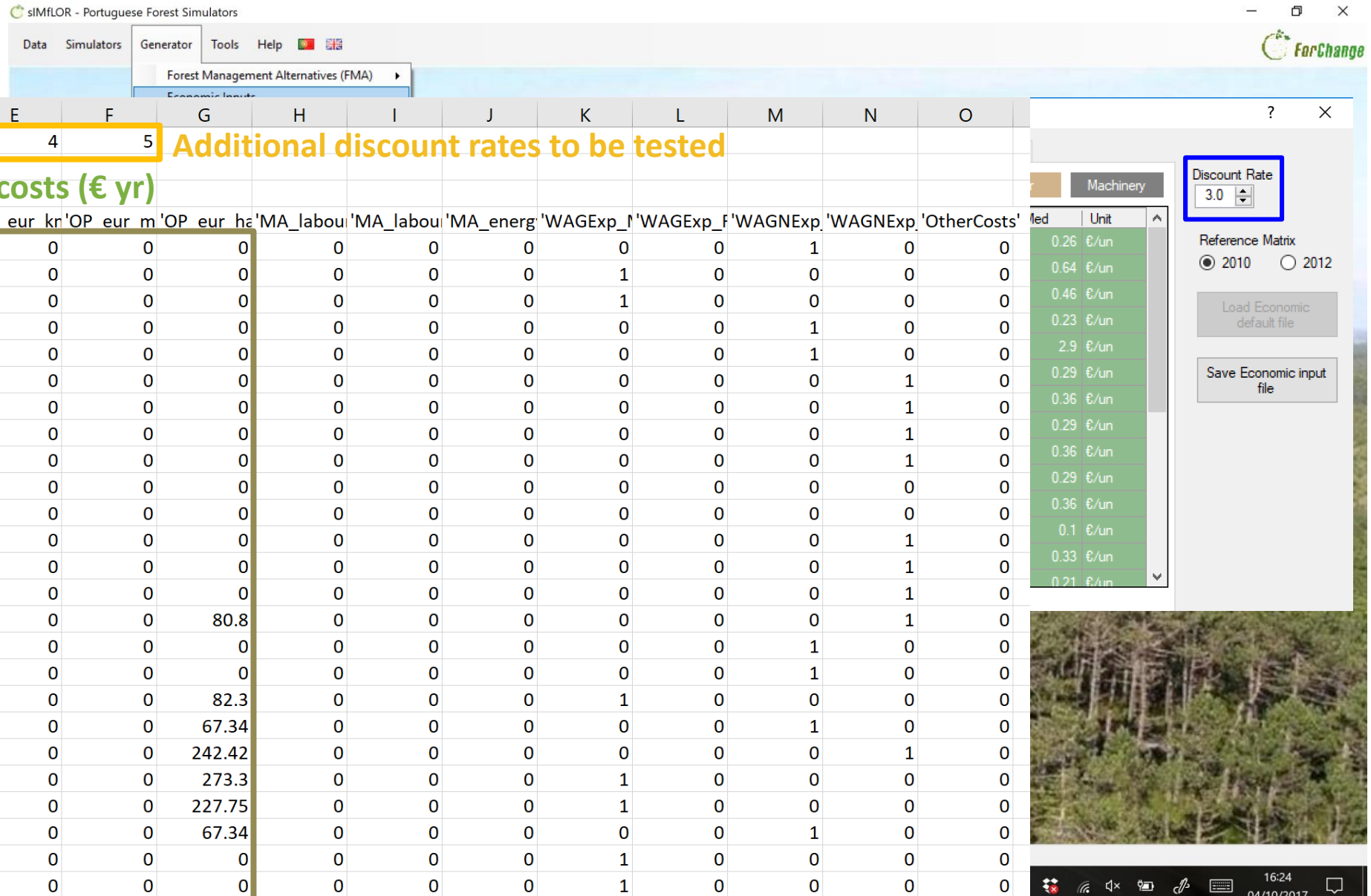
Operations/economics file

Number of additional discount rates to be tested

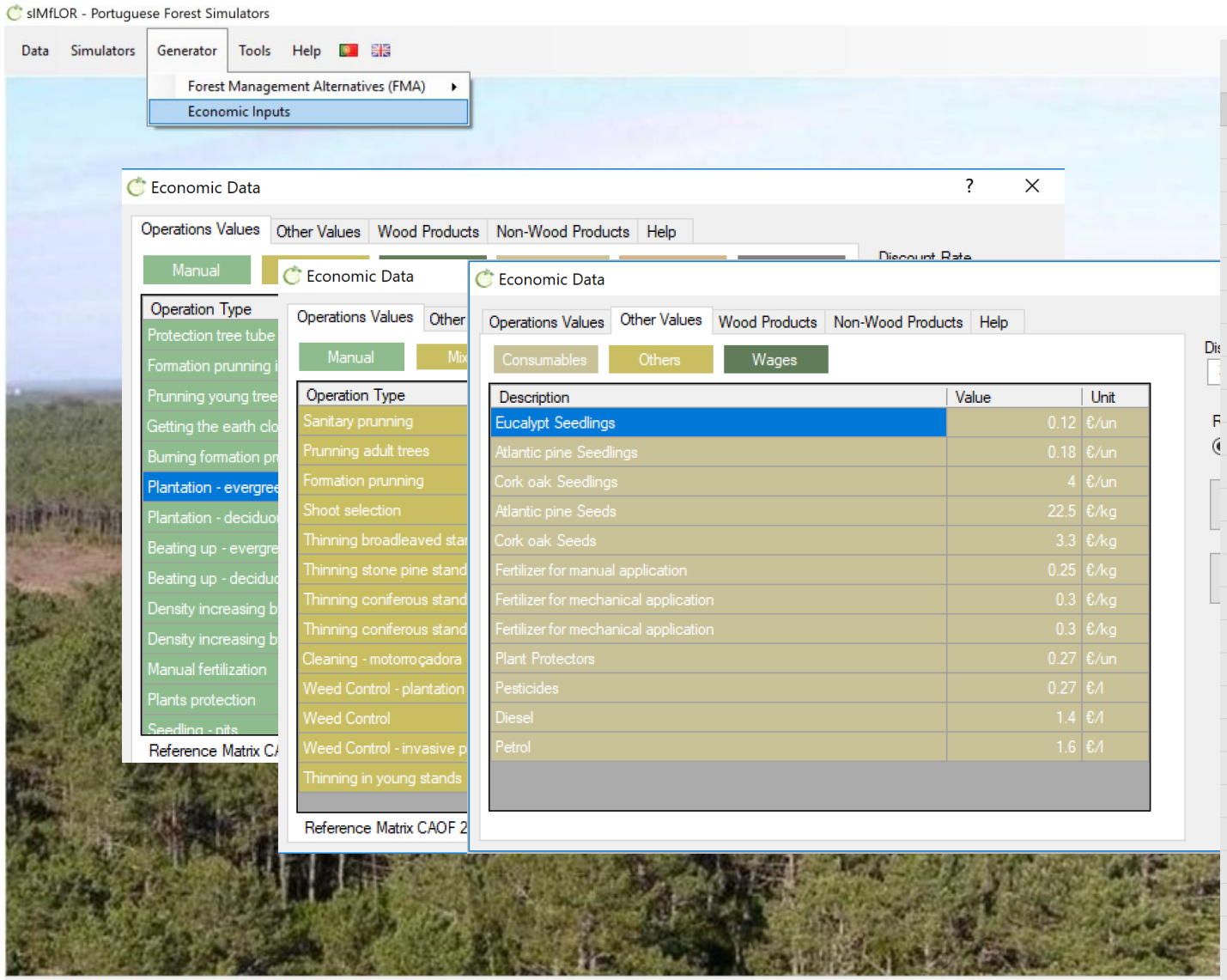
Additional discount rates to be tested

Maintenance costs (€ yr)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Discount Rate'	3	3	3	4	5									
2	Costs Maint	5													
3	Nr operations	68													
4	'TYPE'		'OPERATIO'	'unit_jorna'	'OP_eur_tr'	'OP_eur_kn'	'OP_eur_m'	'OP_eur_ha'	'MA_labou'	'MA_labou'	'MA_energ'	'WAGExp_M'	'WAGExp_F'	'WAGNExp_'	'WAGNExp_'	'OtherCosts'
5	1	'Protection		225	0.24	0	0	0	0	0	0	0	0	1	0	0
6	2	'Formation		105	0.59	0	0	0	0	0	0	1	0	0	0	0
7	3	'Prunning y		145	0.43	0	0	0	0	0	0	1	0	0	0	0
8	4	'Getting the		250	0.22	0	0	0	0	0	0	0	0	1	0	0
9	5	'Burning fo		20	2.69	0	0	0	0	0	0	0	0	1	0	0
10	6	'Plantation		200	0.27	0	0	0	0	0	0	0	0	0	1	0
11	7	'Plantation		112.5	0.48	0	0	0	0	0	0	0	0	0	1	0
12	8	'Beating up		200	0.27	0	0	0	0	0	0	0	0	0	1	0
13	9	'Beating up		112.5	0.48	0	0	0	0	0	0	0	0	0	1	0
14	10	OPMan_Ad		0	0	0	0	0	0	0	0	0	0	0	0	0
15	11	OPMan_AD		0	0	0	0	0	0	0	0	0	0	0	0	0
16	12	'Fertilizatio		600	0.09	0	0	0	0	0	0	0	0	0	1	0
17	13	'Placing pla		175	0.31	0	0	0	0	0	0	0	0	0	1	0
18	14	'Seedling -		275	0.2	0	0	0	0	0	0	0	0	0	1	0
19	15	'Seedling -		1.5	0	0	0	80.8	0	0	0	0	0	0	1	0
20	16	'Open plant		115	0.47	0	0	0	0	0	0	0	0	1	0	0
21	17	'Open plant		55	0.98	0	0	0	0	0	0	0	0	1	0	0
22	18	'Selection c		1	0	0	0	82.3	0	0	0	1	0	0	0	0
23	19	'Marking na		1.25	0	0	0	67.34	0	0	0	0	0	1	0	0
24	20	'Control inv		4.5	0	0	0	242.42	0	0	0	0	0	0	1	0
25	21	'Fire contro		3	0	0	0	273.3	0	0	0	1	0	0	0	0
26	22	'Fire contro		2.5	0	0	0	227.75	0	0	0	1	0	0	0	0
27	23	'Marking ou		1.25	0	0	0	67.34	0	0	0	0	0	1	0	0
28	24	'Cork stripp		0	0	0	0	0	0	0	0	1	0	0	0	0
29	25	'Cork stripp		0	0	0	0	0	0	0	0	1	0	0	0	0

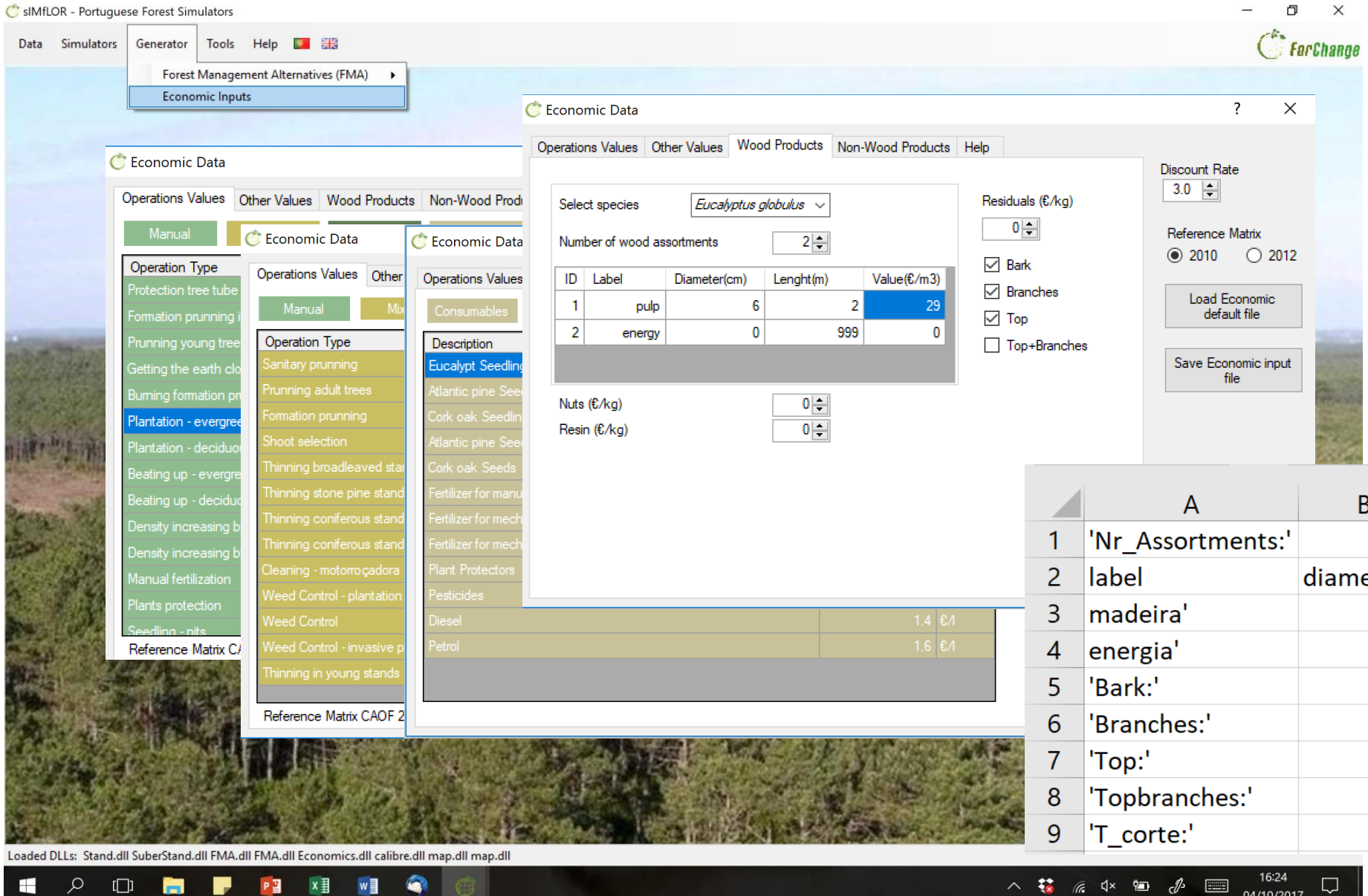


Consumables file

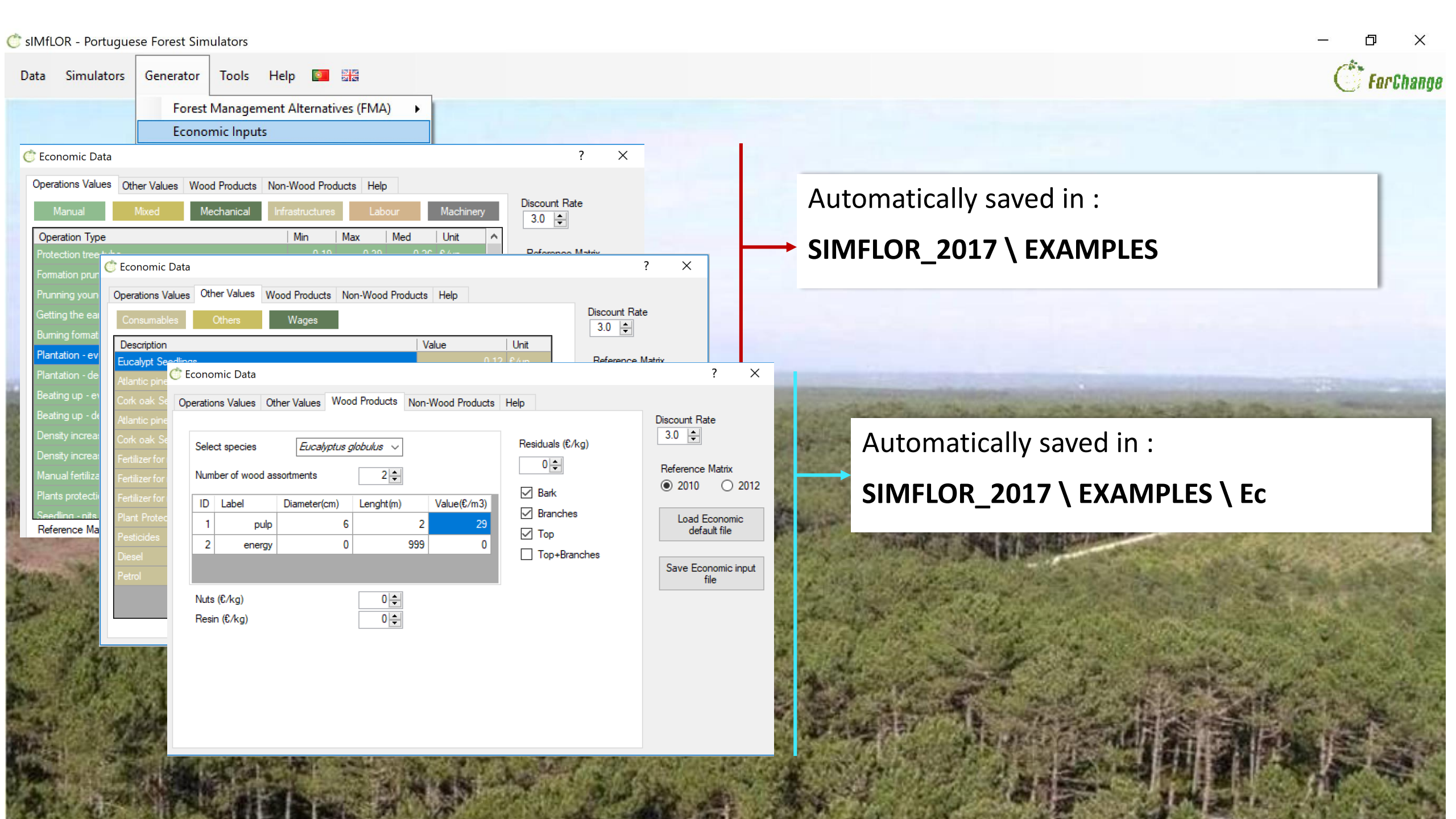


	A	B	C	D
1	Ncons:	24		
2	'Description'	'eur_tree'	'eur_kg'	'eur_l'
3	'Atlantic pine Seedlings'	0.18	0	0
4	'Eucalypt Seedlings'	0.2	0	0
5	'Cork oak Seedlings'	0.35	0	0
6	'Atlantic pine Seeds'	0	22.5	0
7	'Cork oak Seeds'	0	3.3	0
8	'Fertilizer for manual application (slow release)'	0	1.3	0
9	'Fertilizer for mechanical application'	0	0.25	0
10	'Fertilizer for mechanical application (subsoil)'	0	0.3	0
11	'Plant Protectors'	0.27	0	0
12	'Pesticides'	9999	0	0
13	'Diesel'	0	0	1
14	'Petrol'	0	0	1.2
15	'Maintenace annual costs'	0	0	0
16	'Fencing'	0	0	0
17	'Game additional costs (licences)'	0	0	0
18	'Game guard'	0	0	0
19	'Cost of red deer male'	0	0	0
20	'Cost of red deer female'	0	0	0
21	'Game trophy'	0	0	0
22	'Game meat'	0	1	0
23	'Specialized male labour cost'	0	0	0
24	'Non-specialized male labour cost'	0	0	0
25	'Specialized female labour cost'	0	0	0
26	'Non-specialized female labour cost'	0	0	0
27	End of file			

Assortments file



	A	B	C	D	E
1	'Nr_Assortments:'	2			
2	label	diameter	lenght	Dbark	value'
3	madeira'	6	2	1	29
4	energia'	0	999	1	0
5	'Bark:'	1			
6	'Branches:'	1			
7	'Top:'	1			
8	'Topbranches:'	0			
9	'T_corte:'	10			


sIMfLOR - Portuguese Forest Simulators
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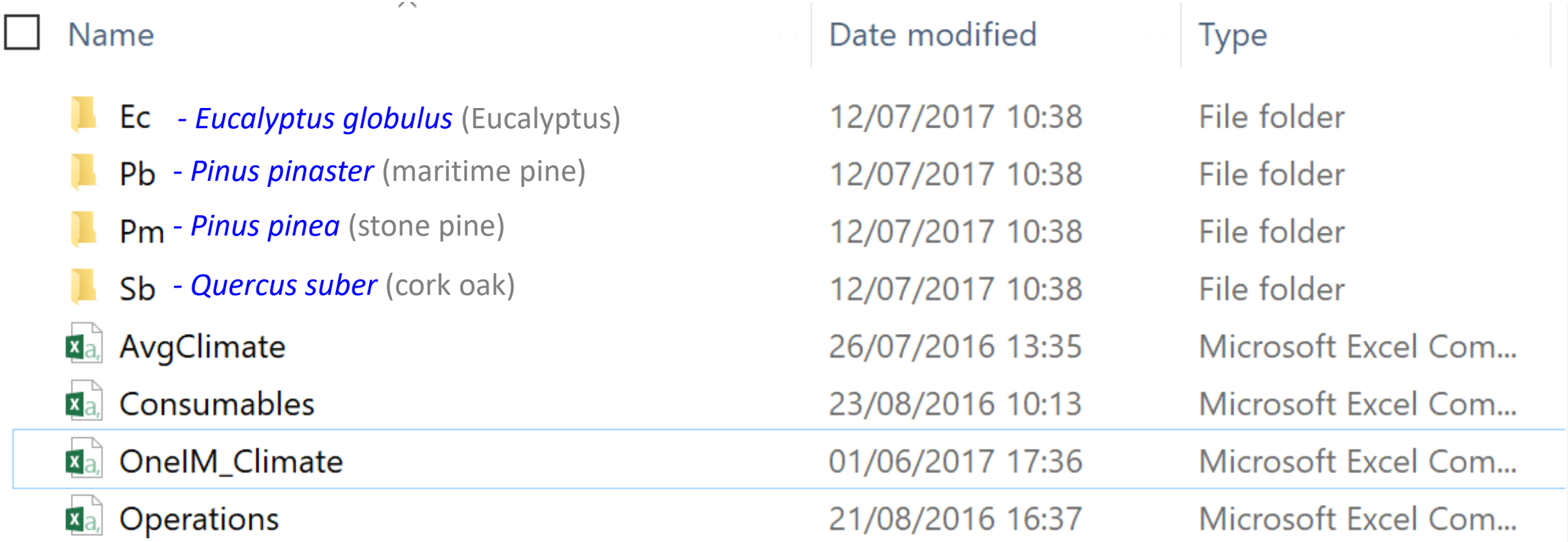
Forest Management Alternatives (FMA)
Economic Inputs
Economic Data
Operations Values
Other Values
Wood Products
Non-Wood Products
Help
Manual
Mixed
Mechanical
Infrastructures
Labour
Machinery
Operation Type
Min
Max
Med
Unit
Discount Rate
3.0
Reference Matrix
Consumables
Others
Wages
Description
Value
Unit
Select species
Eucalyptus globulus
Number of wood assortments
2
ID
Label
Diameter(cm)
Lenght(m)
Value(€/m3)
1
pulp
6
2
29
2
energy
0
999
0
Residuals (€/kg)
Bark
Branches
Top
Top+Branches
Nuts (€/kg)
Resin (€/kg)
Reference Matrix
2010
2012
Load Economic default file
Save Economic input file
Automatically saved in :
SIMFLOR_2017 \ EXAMPLES
Automatically saved in :
SIMFLOR_2017 \ EXAMPLES \ Ec

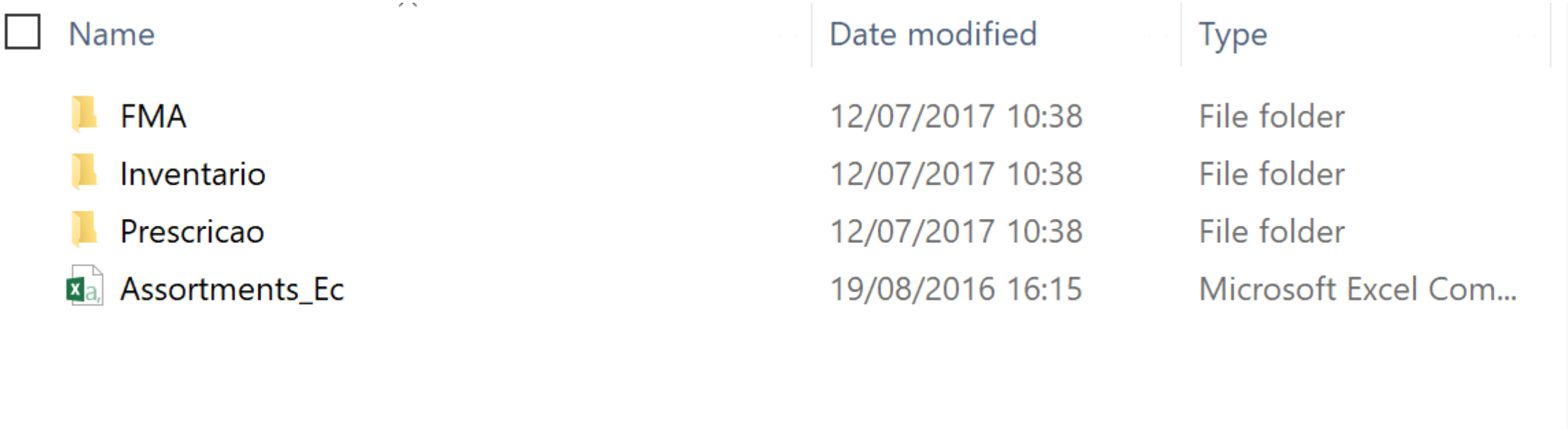
Default files as those produced with the “Generator” are @:

\...\ SIMFLOR_2017 \ EXAMPLES



Default files as those produced with the “Generator” are @:

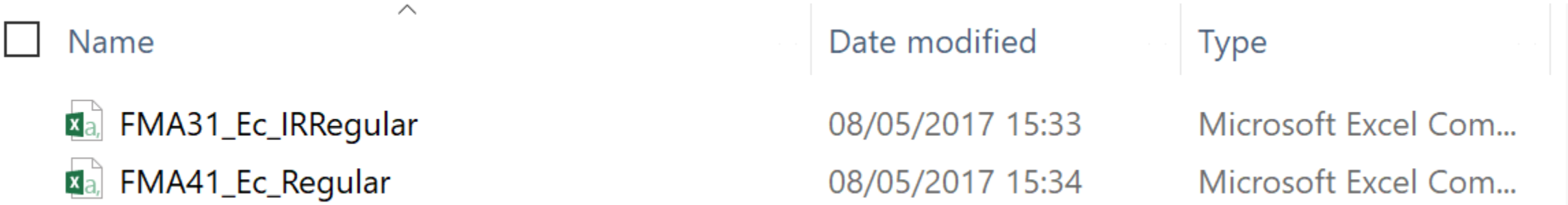
\...\ SIMFLOR_2017 \ EXAMPLES \ EC

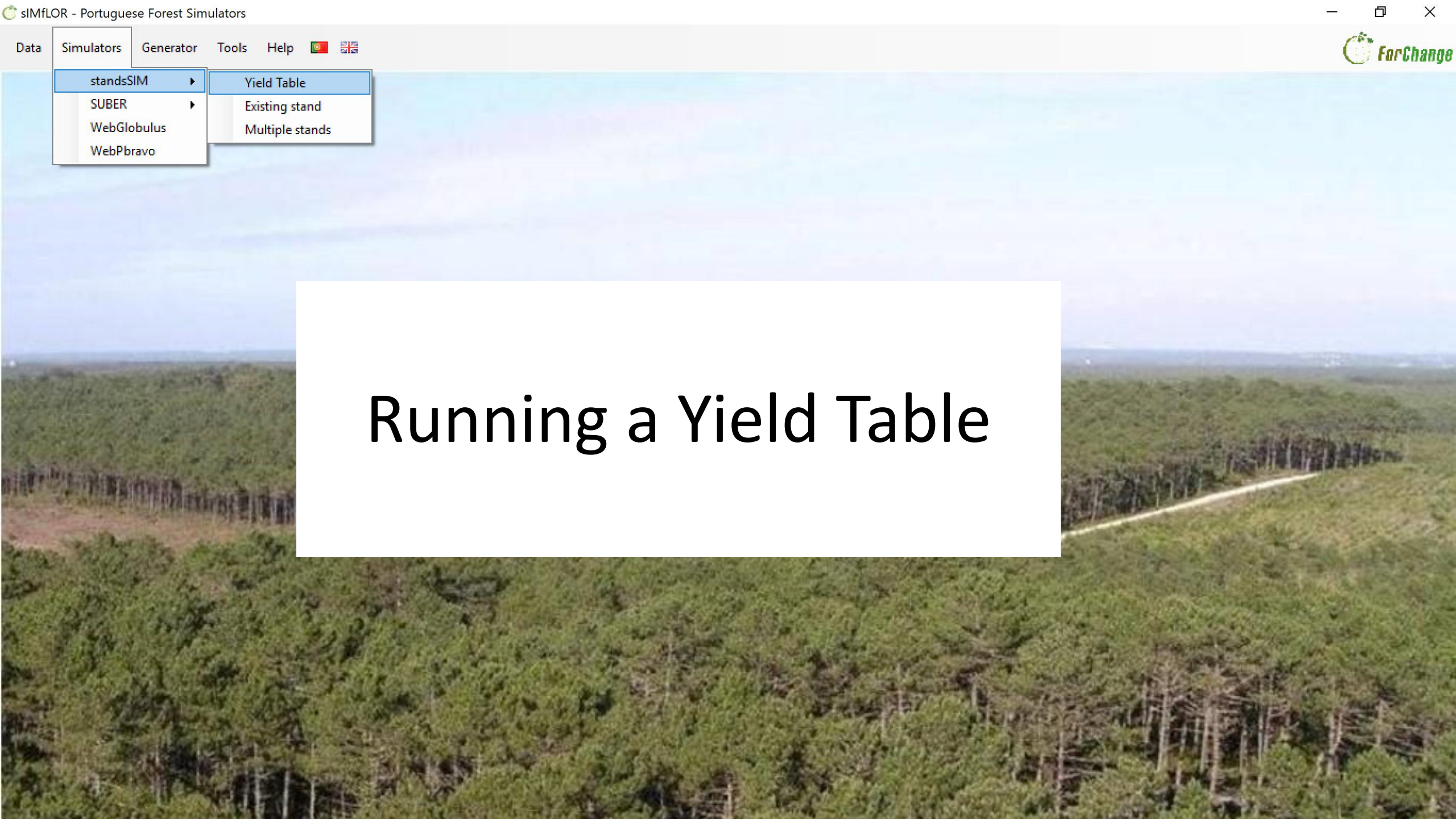


Name	Date modified	Type
FMA	12/07/2017 10:38	File folder
Inventario	12/07/2017 10:38	File folder
Prescricao	12/07/2017 10:38	File folder
Assortments_Ec	19/08/2016 16:15	Microsoft Excel Com...

Default files as those produced with the “Generator” are @:

\...\ SIMFLOR_2017 \ EXAMPLES \ EC \ FMA




sIMfLOR - Portuguese Forest Simulators
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WebGlobulus
WebPbravo
Yield Table
Existing stand
Multiple stands
ForChange
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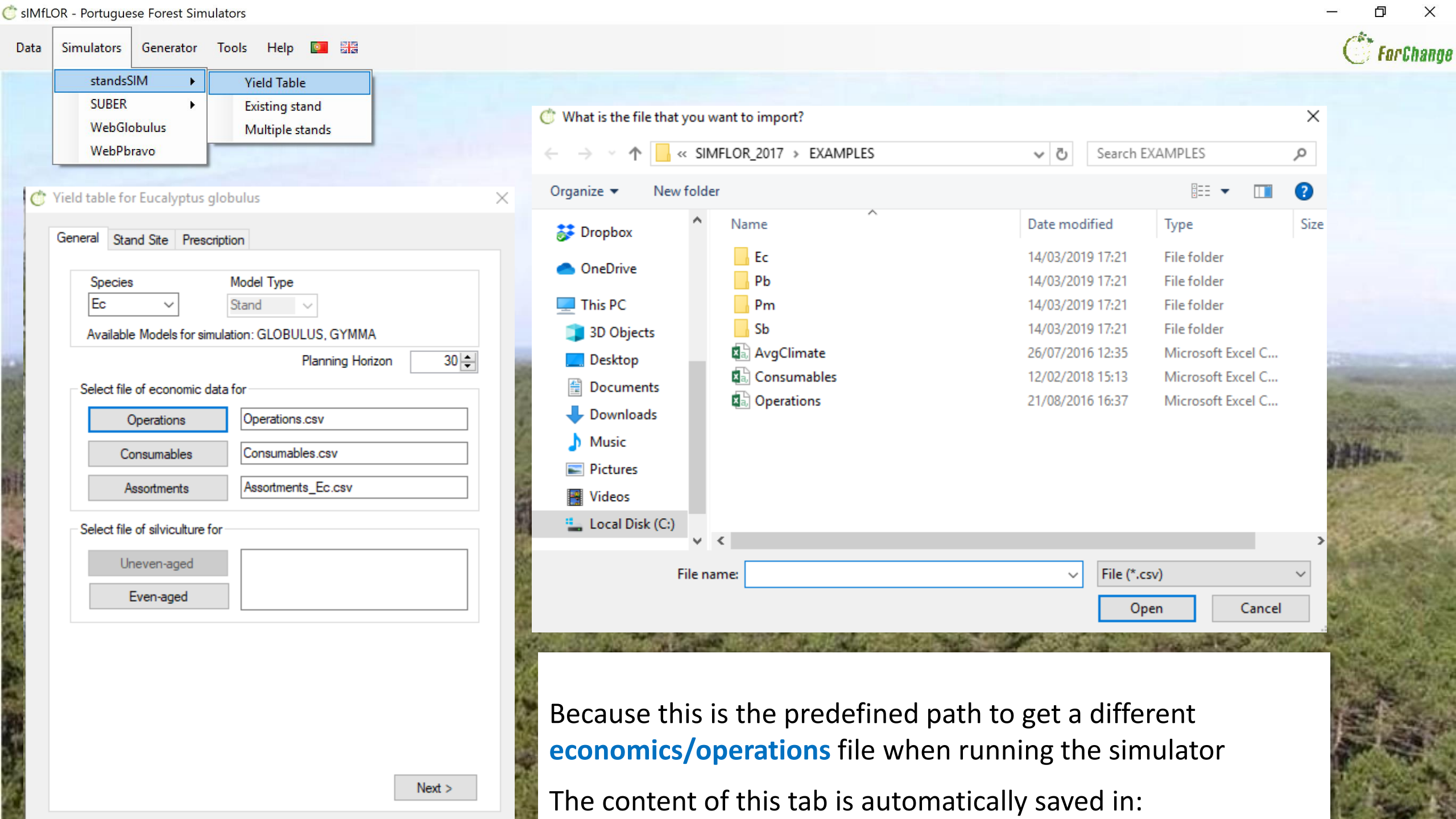
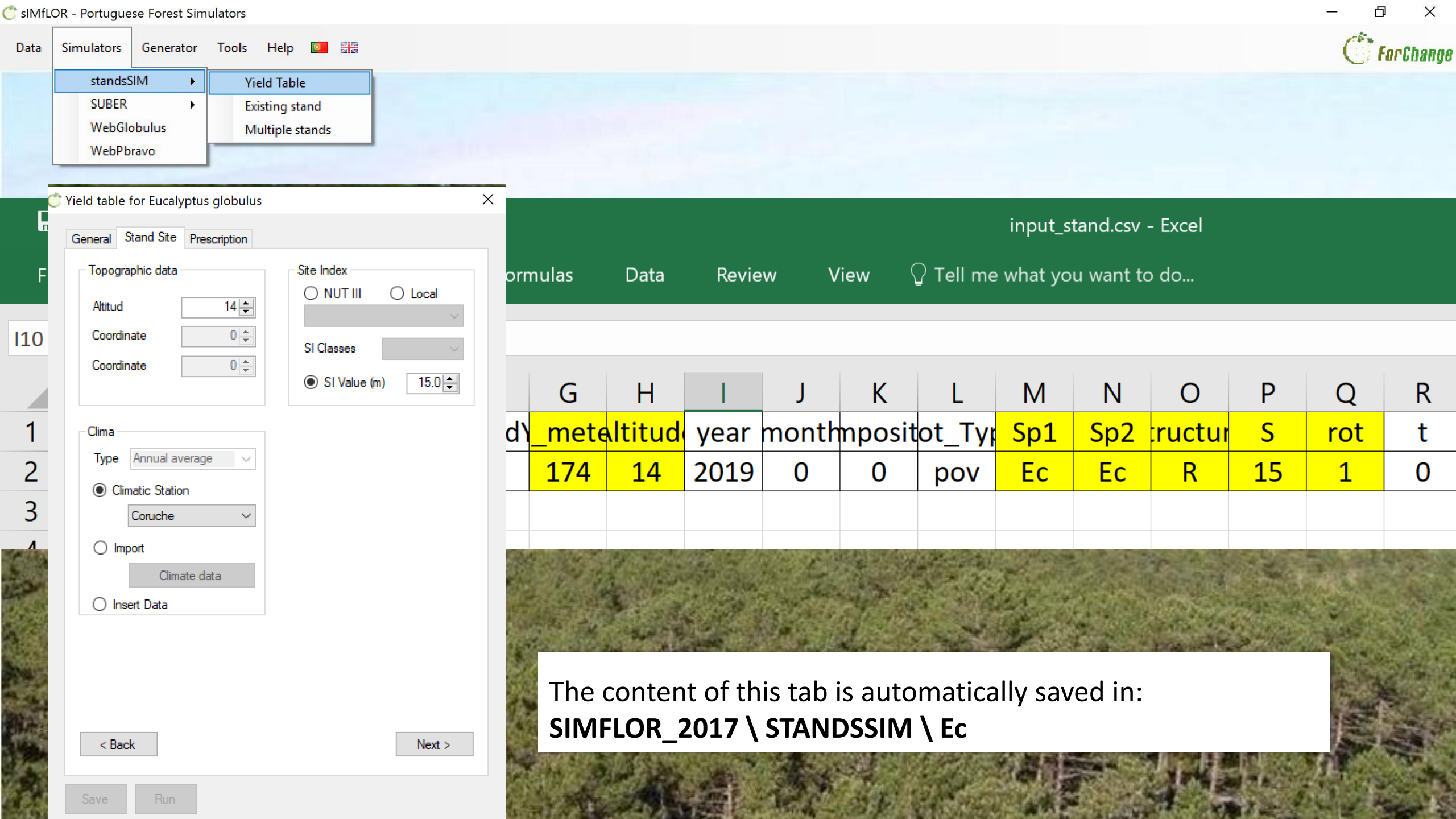


Because this is the predefined path to get a different **economics/operations** file when running the simulator

The content of this tab is automatically saved in: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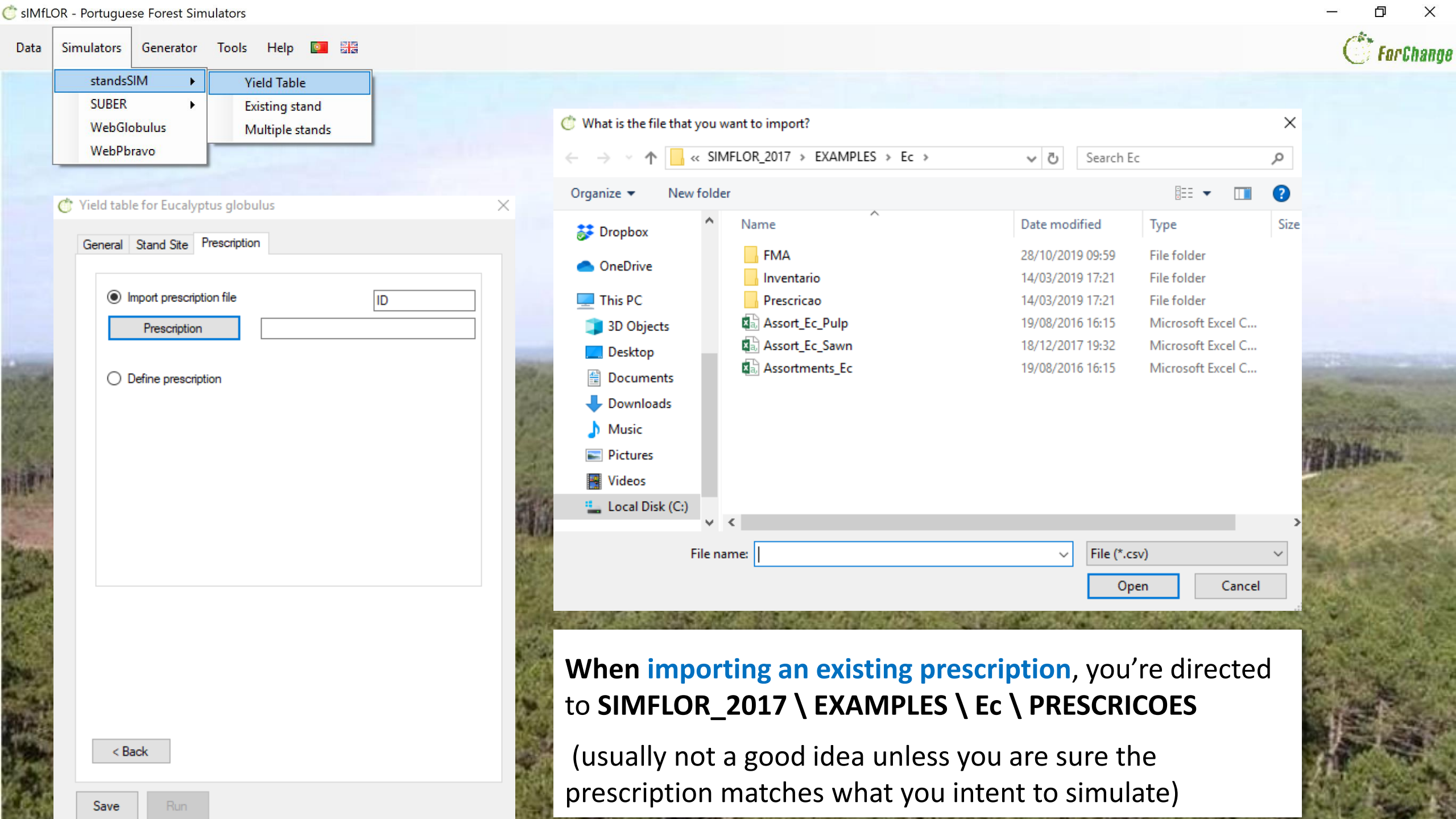
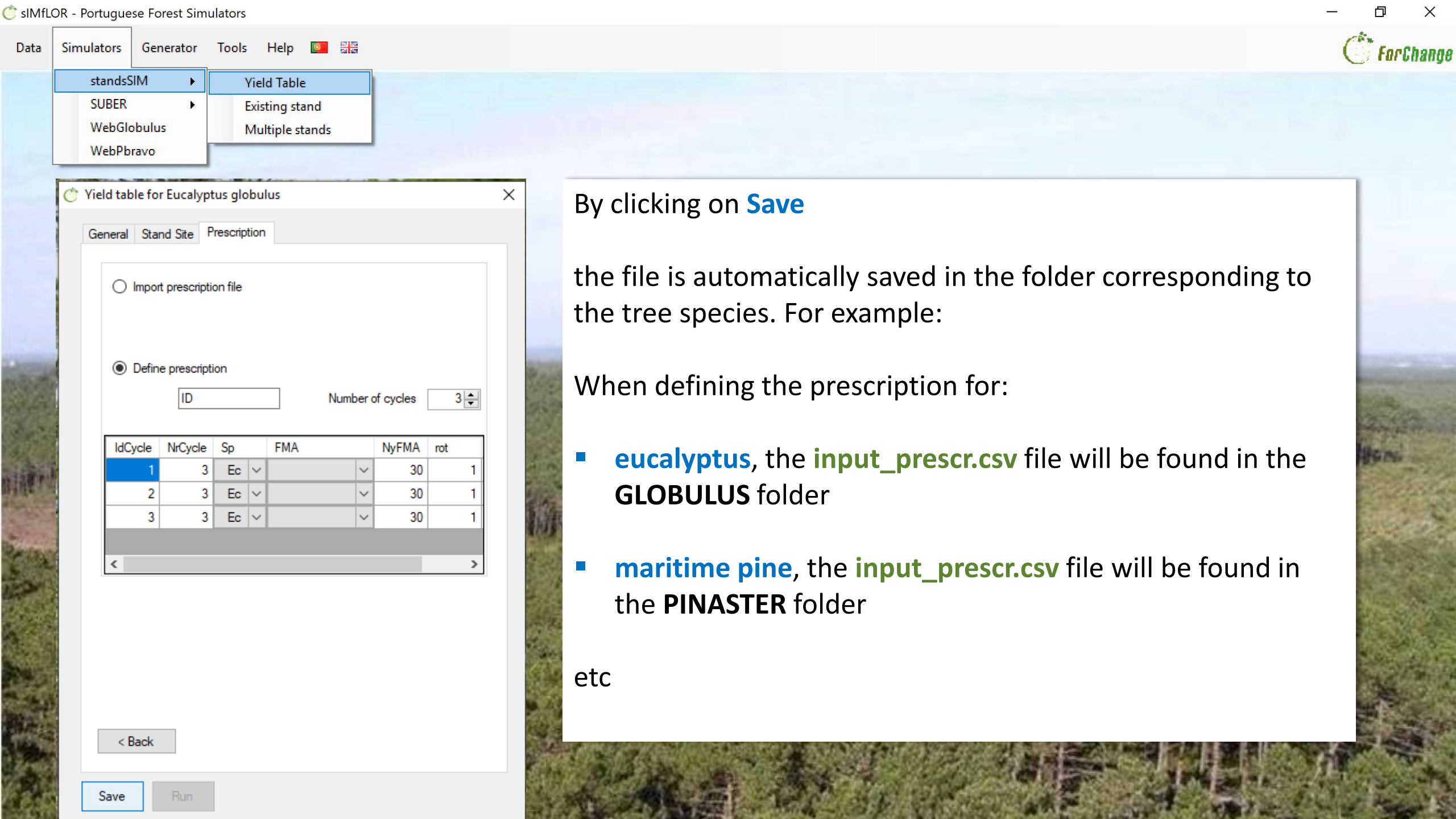
Multiple stands
Yield table for Eucalyptus globulus
General
Stand Site
Prescription
Topographic data
Altitud
14
Coordinate
0
Coordinate
0
Site Index
NUT III
Local
SI Classes
SI Value (m)
15.0
Clima
Type
Annual average
Climatic Station
Coruche
Import
Climate data
Insert Data
< Back
Next >
Save
Run
input_stand.csv - Excel
ormulas
Data
Review
View
Tell me what you want to do...
I10
G
H
I
J
K
L
M
N
O
P
Q
R
dY_mete
altitud
year
month
mposit
ot_Typ
Sp1
Sp2
tructur
S
rot
t
174
14
2019
0
0
pov
Ec
Ec
R
15
1
0
The content of this tab is automatically saved in:
SIMFLOR_2017 \ STANDSSIM \ Ec



When importing an existing prescription, you're directed to **SIMFLOR_2017 \ EXAMPLES \ Ec \ PRESCRICOES**

(usually not a good idea unless you are sure the prescription matches what you intent to simulate)



By clicking on **Save**

the file is automatically saved in the folder corresponding to the tree species. For example:

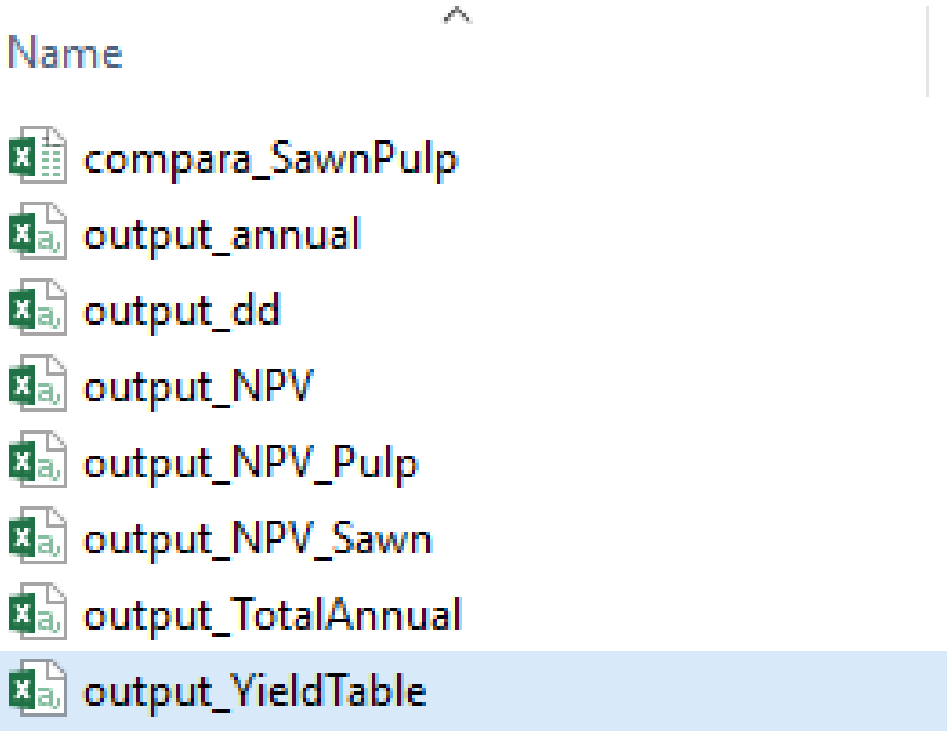
When defining the prescription for:

- **eucalyptus**, the **input_prescr.csv** file will be found in the **GLOBULUS** folder
- **maritime pine**, the **input_prescr.csv** file will be found in the **PINASTER** folder

etc

Simulation Runs' Results can be found at:

\...\ SIMFLOR_2017 \STANDSSIM \ OUTPUT



The **most important output** is the **output_YieldTable.csv**

Remember to always **close this file before you initiate the next simulation** run otherwise you'll get a text message and the program won't run

If you want to save the output file, please rename this otherwise the program will write the results of the next run over the results from the previous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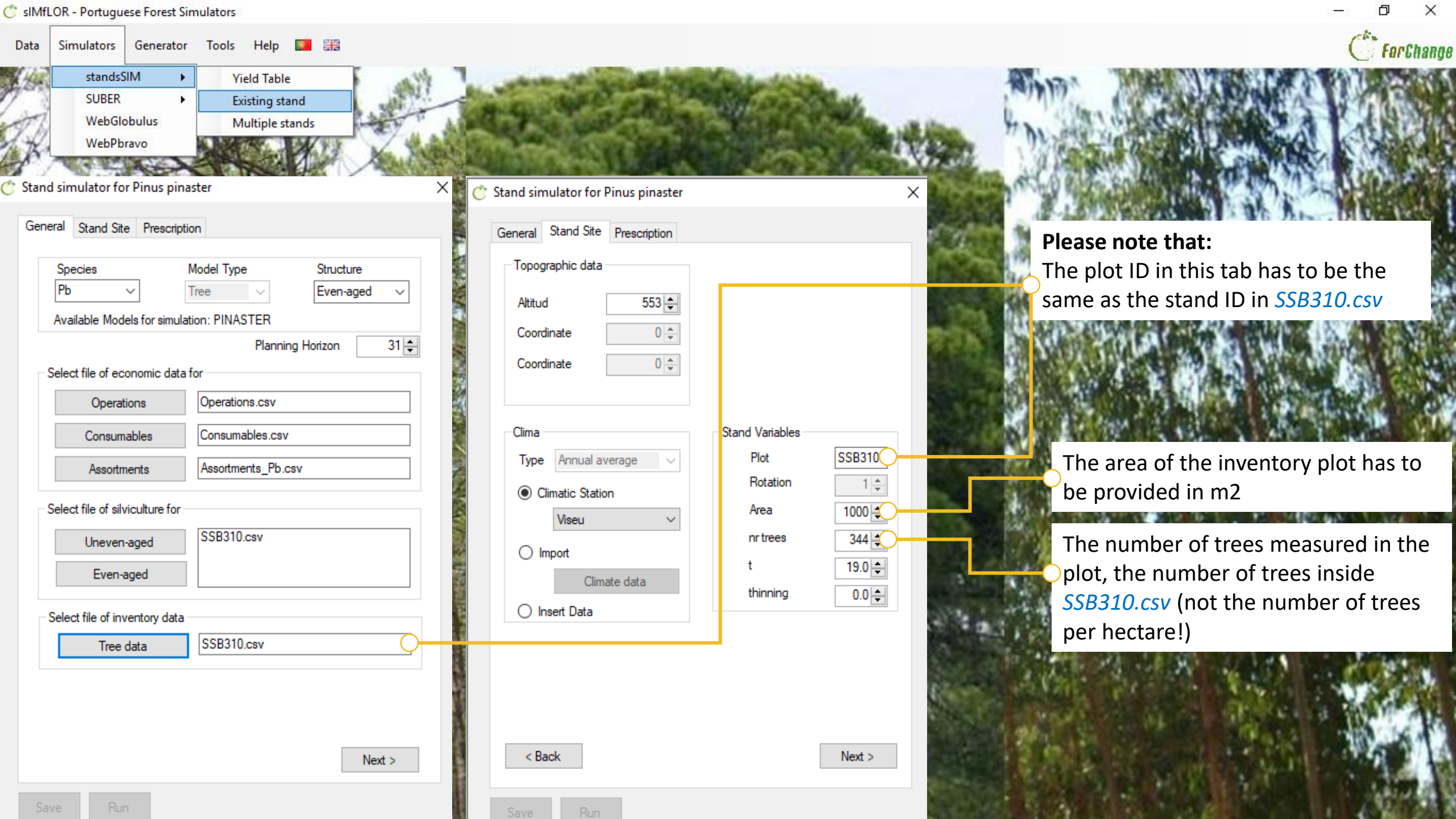
Multiple stands
Running an Existing Stand


sIMfLOR - Portuguese Forest Simulators
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Existing stand
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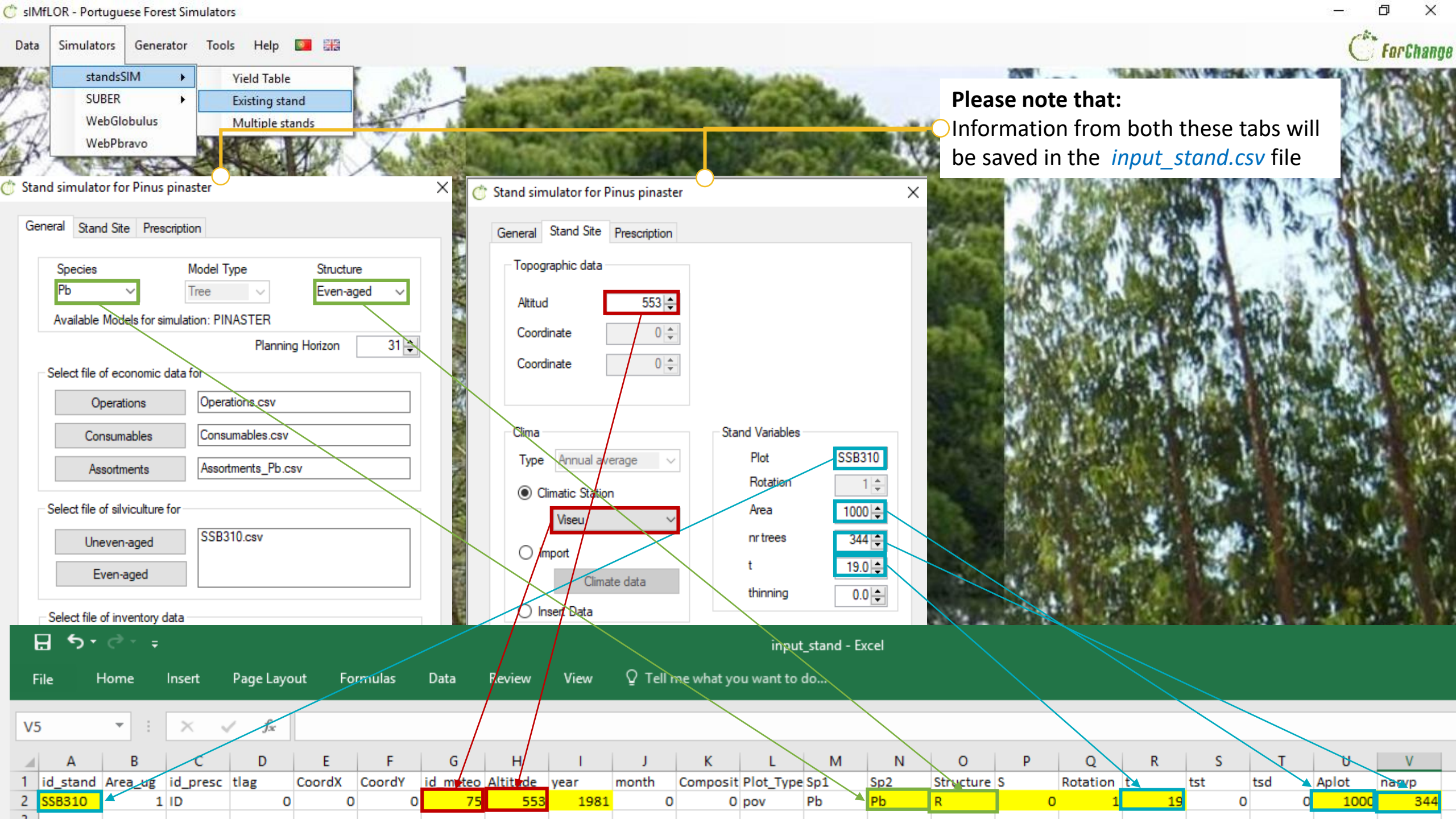
Stand simulator for Pinus pinaster
General
Stand Site
Prescription
Species
Pb
Model Type
Tree
Structure
Even-aged
Available Models for simulation: PINASTER
Planning Horizon
31
Select file of economic data for
Operations
Operations.csv
Consumables
Consumables.csv
Assortments
Assortments_Pb.csv
Select file of silviculture for
Uneven-aged
Even-aged
SSB310.csv
Select file of inventory data
Tree data
SSB310.csv
Next >
Save
Run
Topographic data
Altitud
553
Coordinate
0
Coordinate
0
Clima
Type
Annual average
Climatic Station
Viseu
Import
Climate data
Insert Data
Stand Variables
Plot
SSB310
Rotation
1
Area
1000
nr trees
344
t
19.0
thinning
0.0
< Back
Next >
Please note that:
The plot ID in this tab has to be the same as the stand ID in SSB310.csv
The area of the inventory plot has to be provided in m2
The number of trees measured in the plot, the number of trees inside SSB310.csv (not the number of trees per hectare!)


sIMfLOR - Portuguese Forest Simulators
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WebPbravo
Yield Table
Existing stand
Multiple stands
Please note that:
Information from both these tabs will be saved in the input_stand.csv file
Stand simulator for Pinus pinaster
General
Stand Site
Prescription
Species
Pb
Model Type
Tree
Structure
Even-aged
Available Models for simulation: PINASTER
Planning Horizon
31
Select file of economic data for
Operations
Operations.csv
Consumables
Consumables.csv
Assortments
Assortments_Pb.csv
Select file of silviculture for
Uneven-aged
Even-aged
SSB310.csv
Select file of inventory data
Stand simulator for Pinus pinaster
General
Stand Site
Prescription
Topographic data
Altitud
553
Coordinate
0
Coordinate
0
Clima
Type
Annual average
Climatic Station
Viseu
Import
Climate data
Insert Data
Stand Variables
Plot
SSB310
Rotation
1
Area
1000
nr trees
344
t
19.0
thinning
0.0
input_stand - Excel
File
Home
Insert
Page Layout
Formulas
Data
Review
View
Tell me what you want to do...
V5
id_stand
Area_ug
id_presc
tlag
CoordX
CoordY
id_meteo
Altitude
year
month
Composit
Plot_Type
Sp1
Sp2
Structure
S
Rotation
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tst
tsd
Aplot
nasvp
SSB310
1
ID
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0
0
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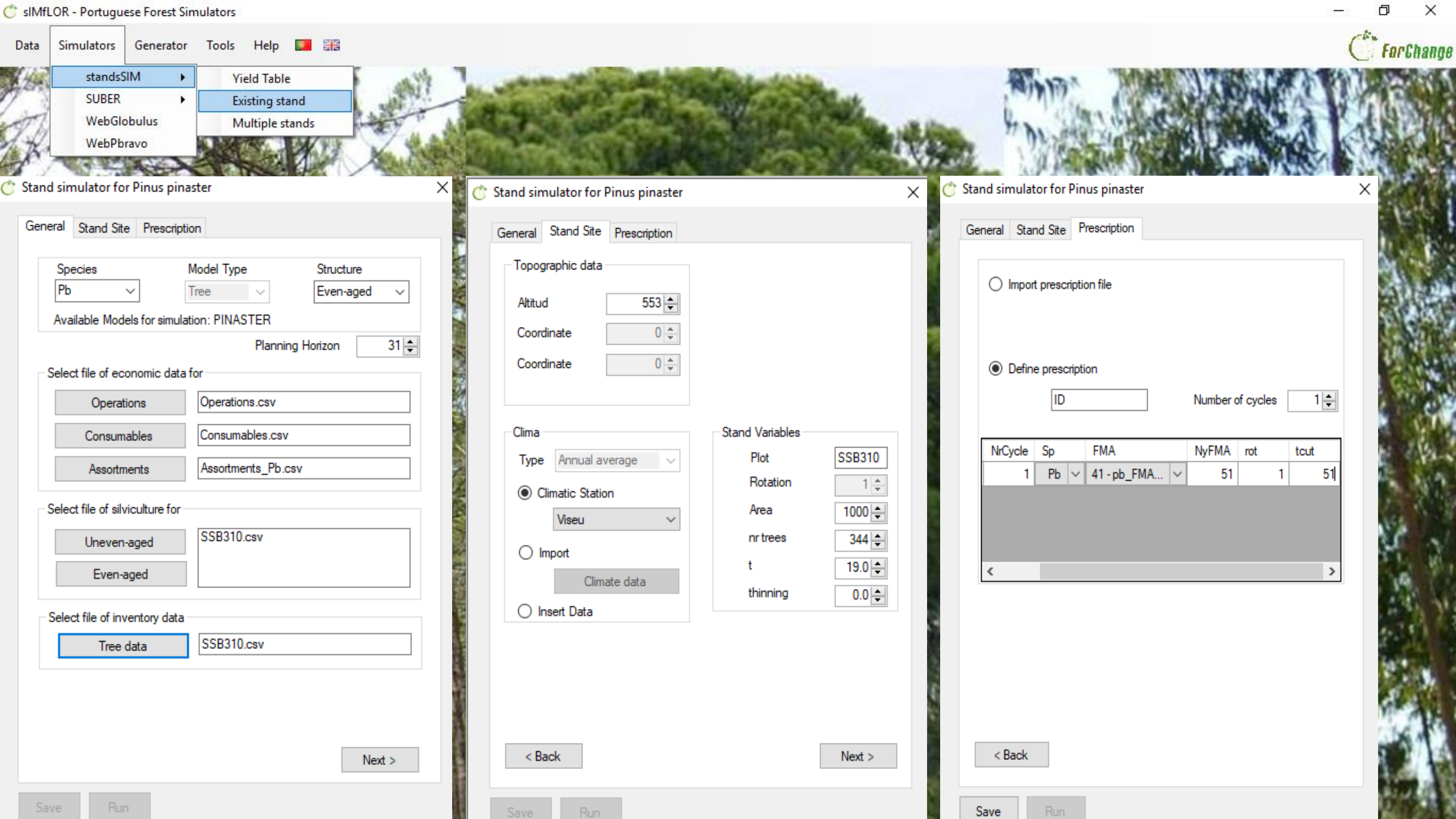
553
1981
0
0
pov
Pb
Pb
R
0
1
19
0
0
1000
344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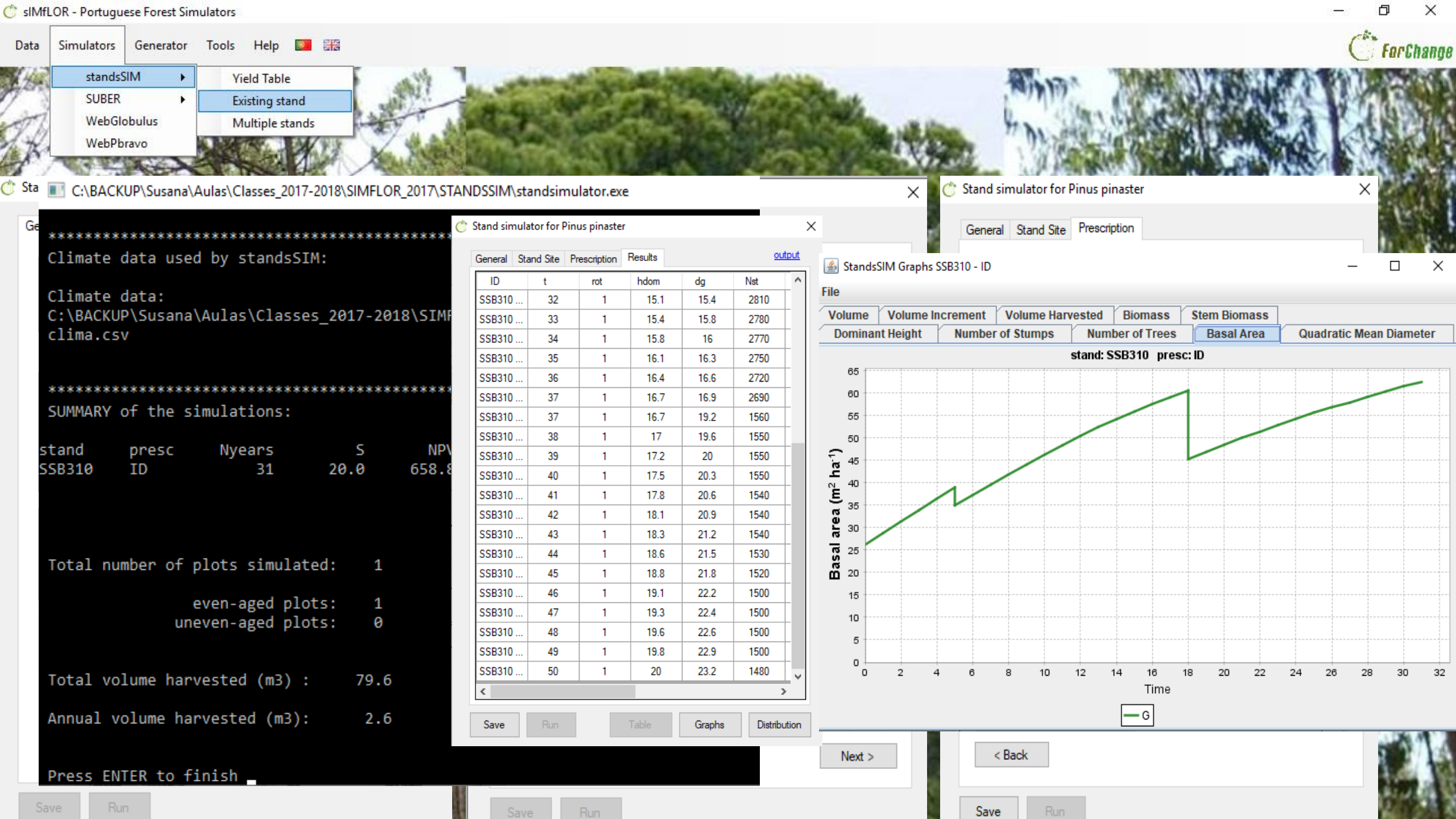
ForChange
standsSIM
SUBER
WebGlobulus
WebPbravo
Yield Table
Existing stand
Multiple stands
Stand simulator for Pinus pinaster
General
Stand Site
Prescription
Species
Pb
Model Type
Tree
Structure
Even-aged
Available Models for simulation: PINASTER
Planning Horizon
31
Select file of economic data for
Operations
Operations.csv
Consumables
Consumables.csv
Assortments
Assortments_Pb.csv
Select file of silviculture for
Uneven-aged
Even-aged
SSB310.csv
Select file of inventory data
Tree data
SSB310.csv
Next >
Save
Run
Topographic data
Altitud
553
Coordinate
0
Coordinate
0
Clima
Type
Annual average
Climatic Station
Viseu
Import
Climate data
Insert Data
Stand Variables
Plot
SSB310
Rotation
1
Area
1000
nr trees
344
t
19.0
thinning
0.0
< Back
Next >
Save
Run
Import prescription file
Define prescription
ID
Number of cycles
1
NrCycle
Sp
FMA
NyFMA
rot
tcut
1
Pb
41 - pb_FMA...
51
1
51
< Back
Save
Run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SUBER
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WebPbravo
Yield Table
Existing stand
Multiple stands
C:\BACKUP\Susana\Aulas\Classes_2017-2018\SIMFLOR_2017\STANDSSIM\standsimulator.exe
Climate data used by standsSIM:
Climate data:
C:\BACKUP\Susana\Aulas\Classes_2017-2018\SIMF
clima.csv
SUMMARY of the simulations:
stand presc Nyears S NPV
SSB310 ID 31 20.0 658.8
Total number of plots simulated: 1
even-aged plots: 1
uneven-aged plots: 0
Total volume harvested (m3) : 79.6
Annual volume harvested (m3): 2.6
Press ENTER to finish
Stand simulator for Pinus pinaster
General
Stand Site
Prescription
Results
output
ID t rot hdom dg Nst
SSB310 ... 32 1 15.1 15.4 2810
SSB310 ... 33 1 15.4 15.8 2780
SSB310 ... 34 1 15.8 16 2770
SSB310 ... 35 1 16.1 16.3 2750
SSB310 ... 36 1 16.4 16.6 2720
SSB310 ... 37 1 16.7 16.9 2690
SSB310 ... 37 1 16.7 19.2 1560
SSB310 ... 38 1 17 19.6 1550
SSB310 ... 39 1 17.2 20 1550
SSB310 ... 40 1 17.5 20.3 1550
SSB310 ... 41 1 17.8 20.6 1540
SSB310 ... 42 1 18.1 20.9 1540
SSB310 ... 43 1 18.3 21.2 1540
SSB310 ... 44 1 18.6 21.5 1530
SSB310 ... 45 1 18.8 21.8 1520
SSB310 ... 46 1 19.1 22.2 1500
SSB310 ... 47 1 19.3 22.4 1500
SSB310 ... 48 1 19.6 22.6 1500
SSB310 ... 49 1 19.8 22.9 1500
SSB310 ... 50 1 20 23.2 1480
Save
Run
Table
Graphs
Distribution
Next >
Stand simulator for Pinus pinaster
General
Stand Site
Prescription
StandsSIM Graphs SSB310 - ID
File
Volume
Volume Increment
Volume Harvested
Biomass
Stem Biomass
Dominant Height
Number of Stumps
Number of Trees
Basal Area
Quadratic Mean Diameter
stand: SSB310 presc: ID
Basal area (m2 ha-1)
Time
G
< Back
Save
Run

Planning Horizon, prescription Tcut and cycles

	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
	thinning					thinning													thinning													
Real Data — Stand age (t)	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
year of simulation (ttotal)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

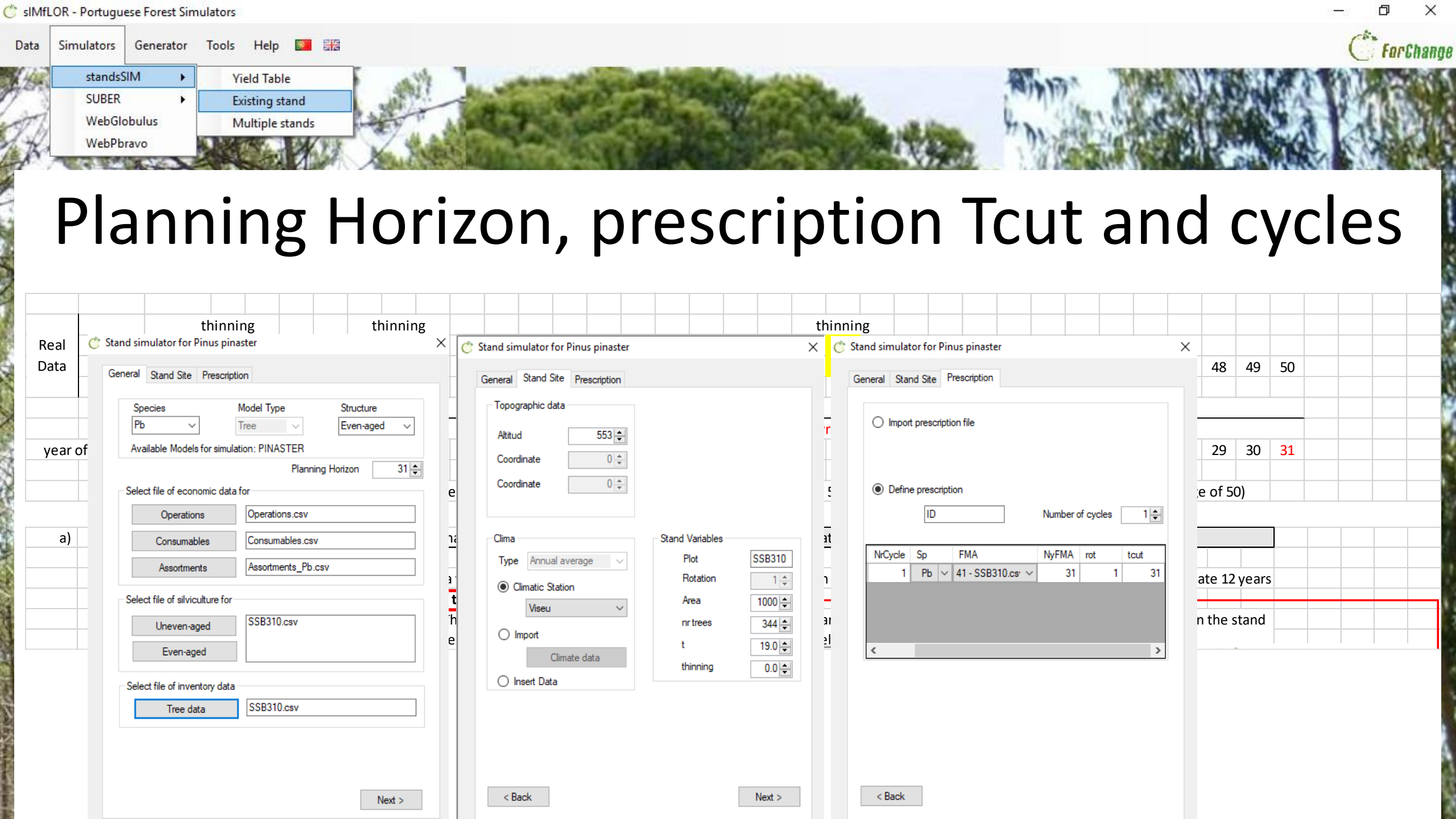
Planning Horizon = 31 yrs

FMA: if you want to simulate stand until the maximum stand age in the "real data" has to have at least 50 rows (operations defined until the stand reaches the age of 50)

a) prescription: 1 cycle : NyFMA = tcut (harvest age)= 31 | the simulator does not know what to do in the remaining years

If you define your prescription with a tcut = 31, you are saying you want to harvest the stand when the stand reaches 31 year of age, meaning it will only simulate 12 years and you get a message saying **" Nyears terminated 12"**

This means the simulator was expecting to simulate for 31 years and your 1 cycle prescription with instructions to cut when the stand reaches age 31 prevents the 31 years of simulation to be fulfield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WebGlobulus
WebPbravo
Yield Table
Existing stand
Multiple stands
Planning Horizon, prescription Tcut and cycles
Real Data
thinning
thinning
thinning
year of
a)
Stand simulator for Pinus pinaster
General
Stand Site
Prescription
Species
Pb
Model Type
Tree
Structure
Even-aged
Available Models for simulation: PINASTER
Planning Horizon
31
Select file of economic data for
Operations
Operations.csv
Consumables
Consumables.csv
Assortments
Assortments_Pb.csv
Select file of silviculture for
Uneven-aged
Even-aged
SSB310.csv
Select file of inventory data
Tree data
SSB310.csv
Next >
Topographic data
Altitud
553
Coordinate
0
Coordinate
0
Clima
Type
Annual average
Climatic Station
Viseu
Import
Climate data
Insert Data
Stand Variables
Plot
SSB310
Rotation
1
Area
1000
nr trees
344
t
19.0
thinning
0.0
< Back
Next >
Import prescription file
Define prescription
ID
Number of cycles
1
NrCycle
Sp
FMA
NyFMA
rot
tcut
1
Pb
41 - SSB310.cs
31
1
31
< Back
48
49
50
29
30
31
e of 50)
ate 12 years
n the stand

Pla n Tcut and cycles

slMfLOR - Portuguese Forest Simulators

C:\BACKUP\Susana\Aulas\Classes_2017-2018\SIMFLOR_2017\STANDSSIM\standsimulator.exe

```
**************************************************************************
Climate data used by standsSIM:

Climate data:
C:\BACKUP\Susana\Aulas\Classes_2017-2018\SIMFLOR_2017\STANDSSIM\PINASTER\i
clima.csv


**************************************************************************
SUMMARY of the simulations:

stand     presc     Nyears          S       NPV       EAA       maiV      Vhar
 SSB310             terminated before the planning horizon - check prescriptio
SSB310     ID            12      20.0    3925.1     223.2      11.0      264.

Total number of plots simulated:    1

              even-aged plots:    1
            uneven-aged plots:    0


Total volume harvested (m3) :    264.5

Annual volume harvested (m3):      8.5
```

Year of simulation = **12**!

Stand simulator for Pinus pinaster

General | Stand Site | Prescription | Results | output

ID	t	rot	hdom	dg	Nst	N
SSB310 ...	19	1	10	9.9	3440	3
SSB310 ...	20	1	10.5	10.3	3440	3
SSB310 ...	21	1	10.9	10.8	3440	3
SSB310 ...	22	1	11.4	11.2	3440	3
SSB310 ...	23	1	11.8	11.6	3440	3
SSB310 ...	24	1	12.2	12	3440	3
SSB310 ...	25	1	12.6	12.4	3430	3
SSB310 ...	26	1	13	12.7	3430	3
SSB310 ...	27	1	13.4	13.1	3430	3
SSB310 ...	28	1	13.7	13.4	3430	3
SSB310 ...	29	1	14.1	13.7	3410	3
SSB310 ...	30	1	14.5	14.1	3380	3
SSB310 ...	31	1	14.8	14.4	3370	3
SSB310 ...	31	1	0	0	0	

Stand age after 12 years of simulation = **31**!

Real Data

year of

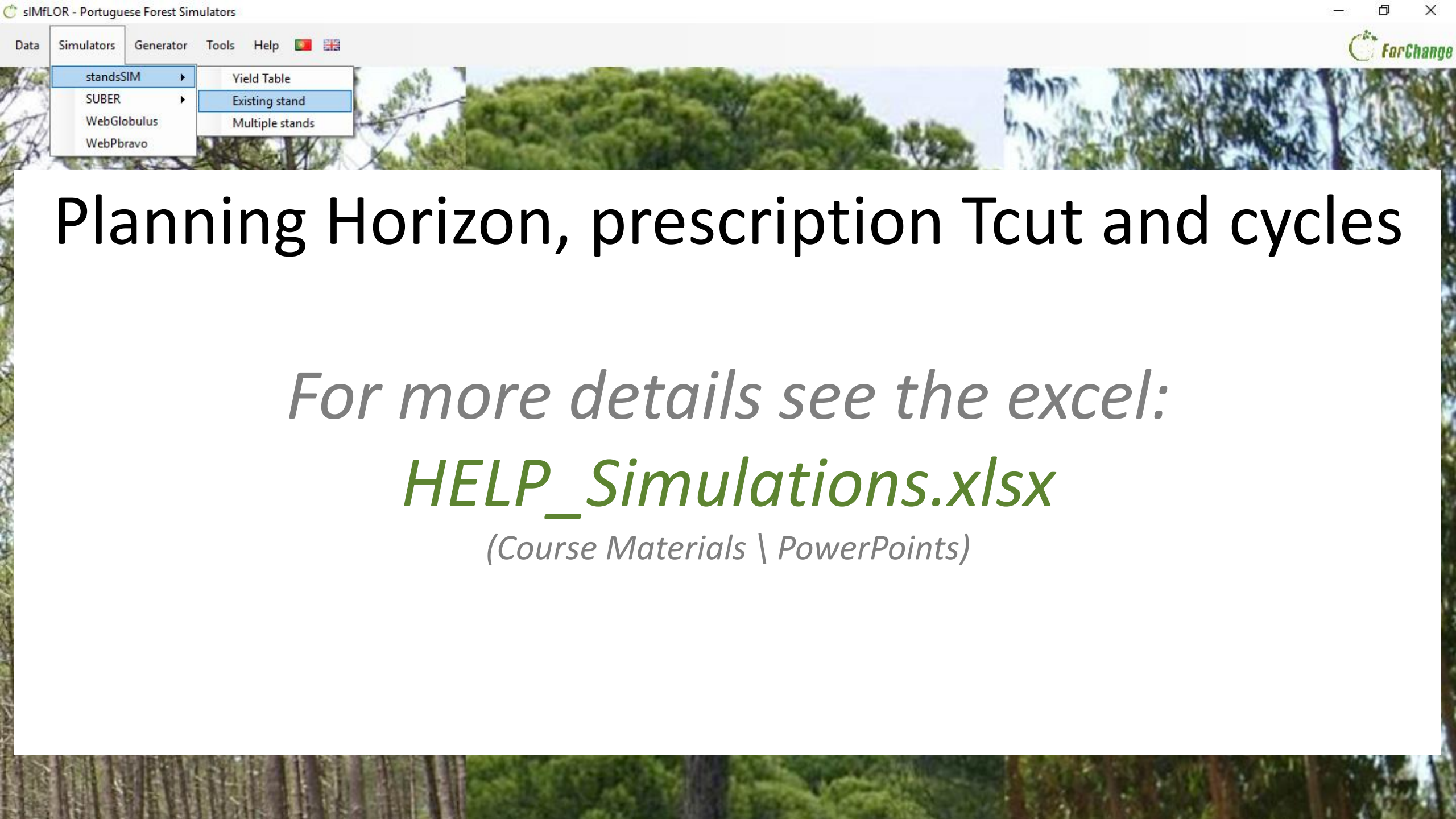
a)

49 50

30 31

years

tand

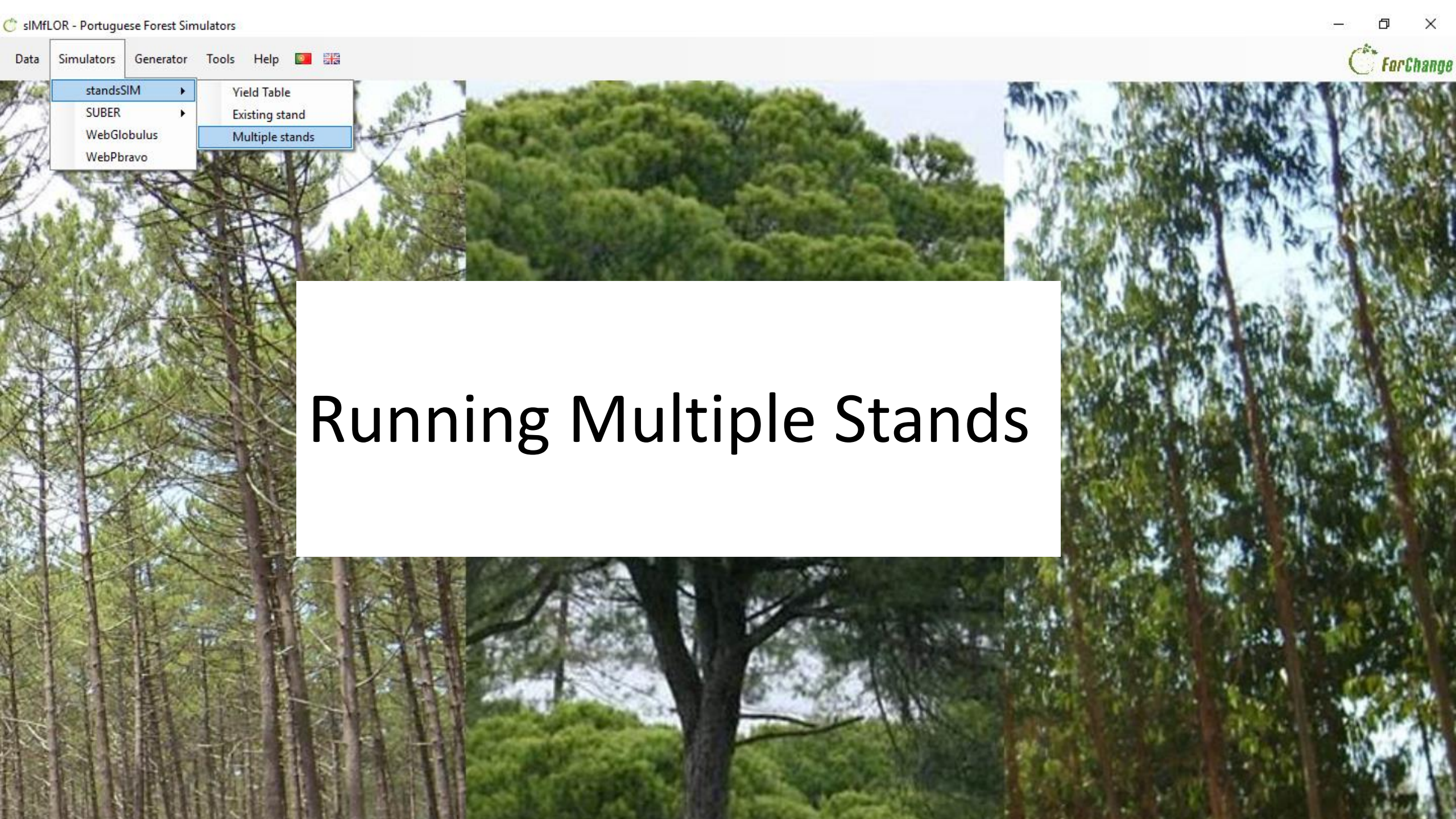


Planning Horizon, prescription Tcut and cycles

For more details see the excel:

HELP_Simulations.xlsx

(Course Materials \ PowerPoints)


slMfLOR - Portuguese Forest Simulators
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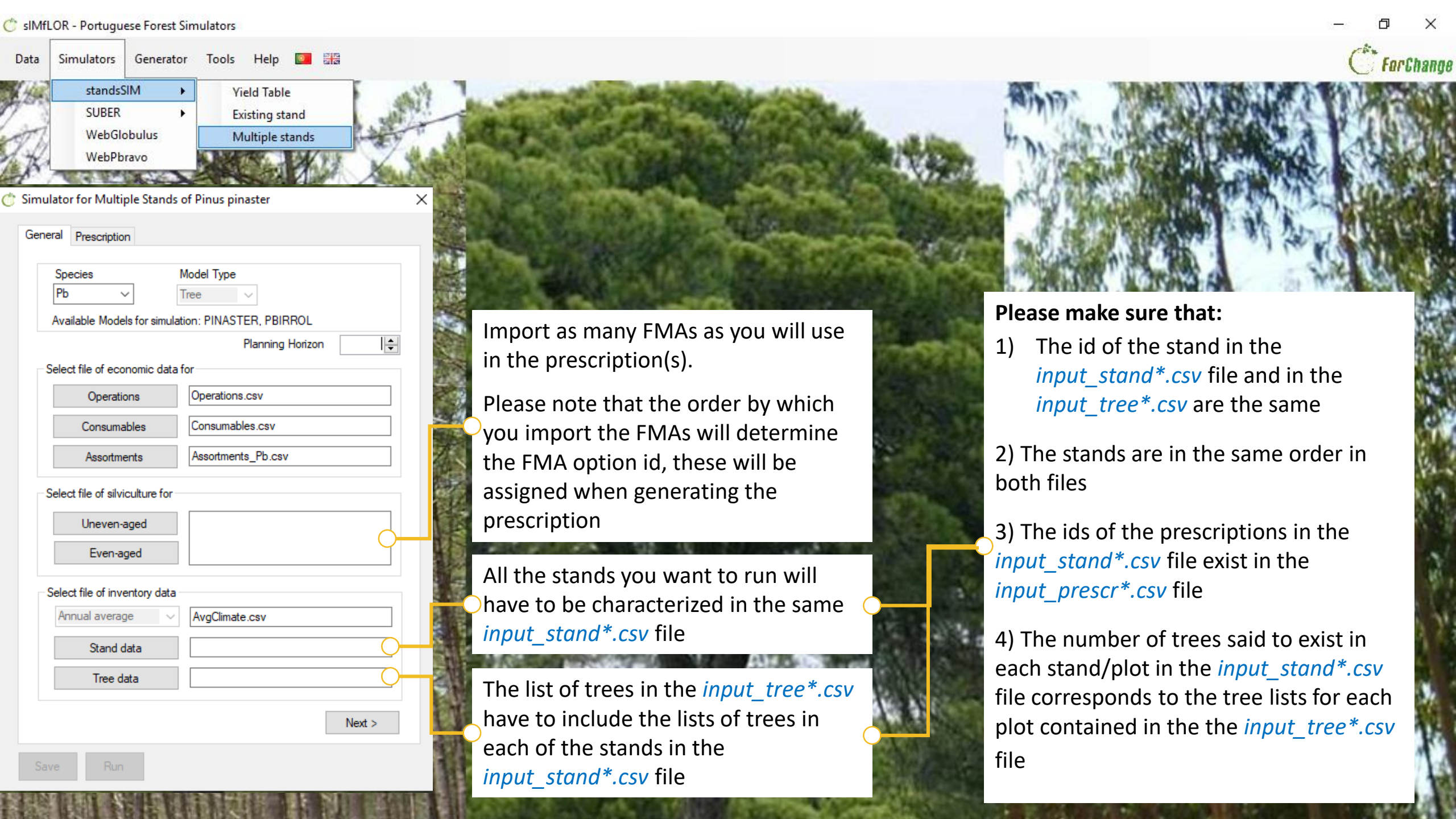
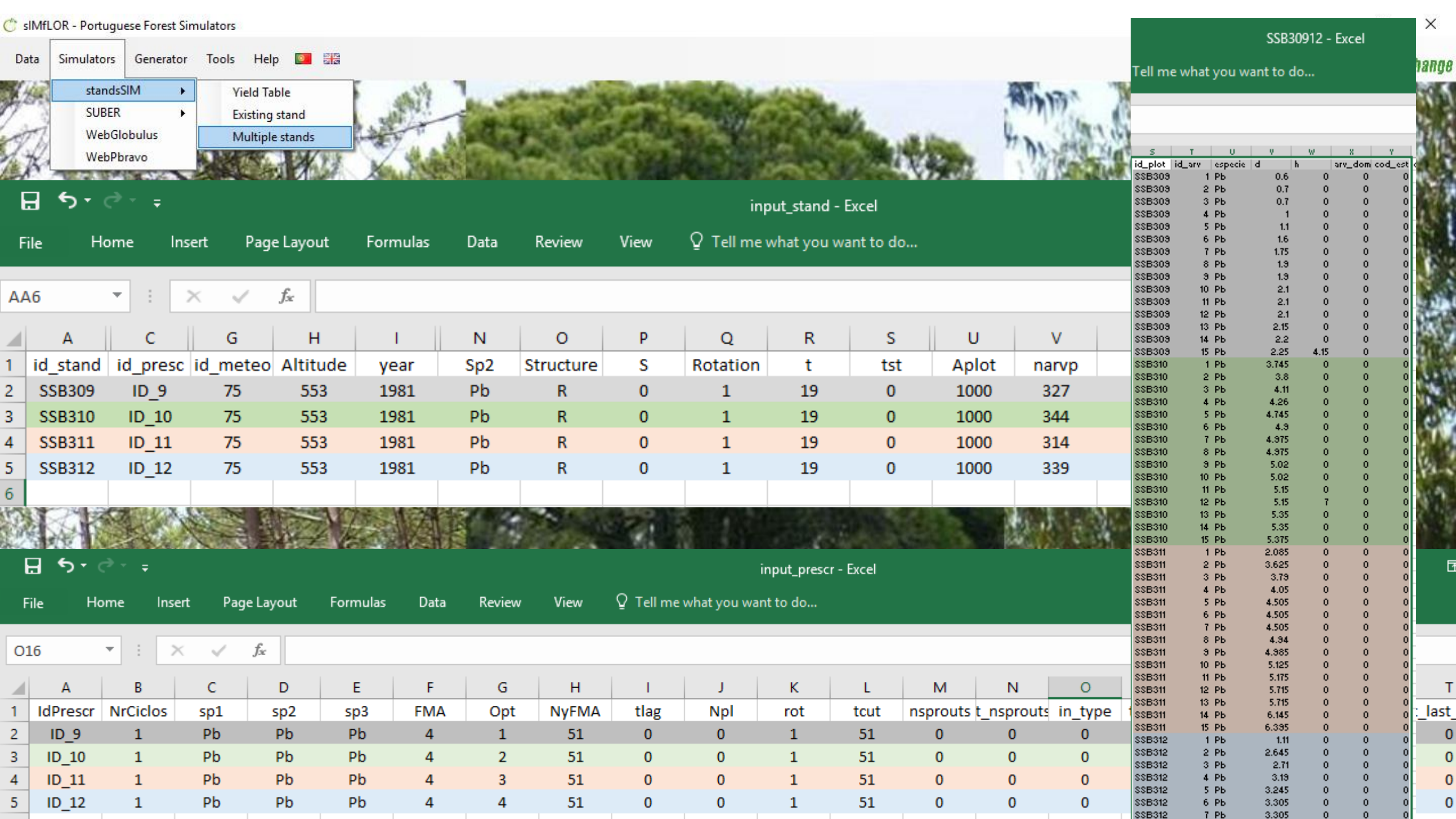
ForChange
standsSIM
SUBER
WebGlobulus
WebPbravo
Yield Table
Existing stand
Multiple stands
Running Multiple Stands

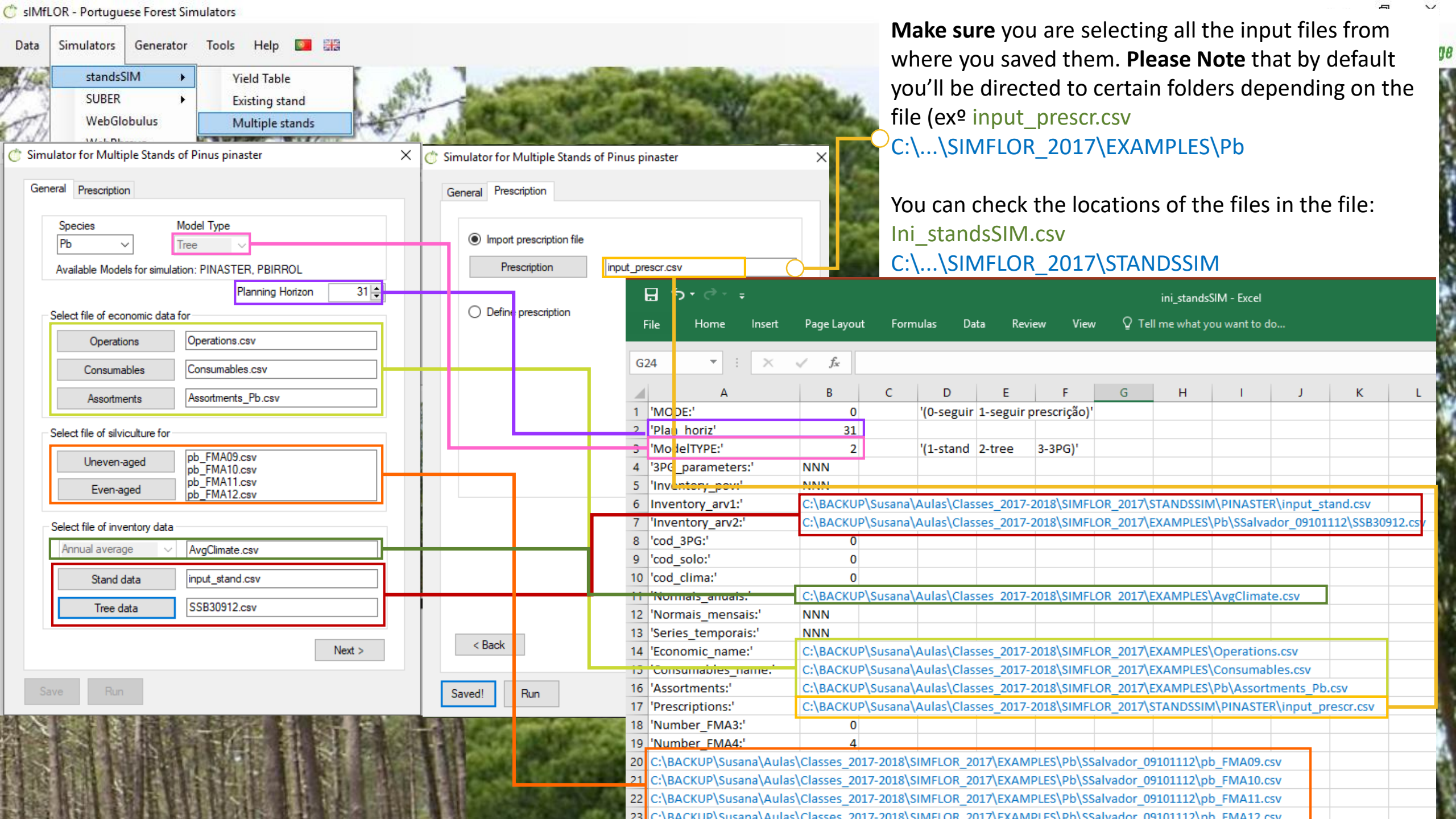

slMfLOR - Portuguese Forest Simulators
Data
Simulators
Generator
Tools
Help
ForChange
standsSIM
SUBER
WebGlobulus
WebPbravo
Yield Table
Existing stand
Multiple stands
Simulator for Multiple Stands of Pinus pinaster
General
Prescription
Species
Pb
Model Type
Tree
Available Models for simulation: PINASTER, PBIRROL
Planning Horizon
Select file of economic data for
Operations
Operations.csv
Consumables
Consumables.csv
Assortments
Assortments_Pb.csv
Select file of silviculture for
Uneven-aged
Even-aged
Select file of inventory data
Annual average
AvgClimate.csv
Stand data
Tree data
Next >
Save
Run
Import as many FMAs as you will use in the prescription(s).
Please note that the order by which you import the FMAs will determine the FMA option id, these will be assigned when generating the prescription
All the stands you want to run will have to be characterized in the same input_stand*.csv file
The list of trees in the input_tree*.csv have to include the lists of trees in each of the stands in the input_stand*.csv file
Please make sure that:
1) The id of the stand in the input_stand*.csv file and in the input_tree*.csv are the same
2) The stands are in the same order in both files
3) The ids of the prescriptions in the input_stand*.csv file exist in the input_prescr*.csv file
4) The number of trees said to exist in each stand/plot in the input_stand*.csv file corresponds to the tree lists for each plot contained in the the input_tree*.csv file



id_stand	id_presc	id_meteo	Altitude	year	Sp2	Structure	S	Rotation	t	tst	Aplot	narvp
SSB309	ID_9	75	553	1981	Pb	R	0	1	19	0	1000	327
SSB310	ID_10	75	553	1981	Pb	R	0	1	19	0	1000	344
SSB311	ID_11	75	553	1981	Pb	R	0	1	19	0	1000	314
SSB312	ID_12	75	553	1981	Pb	R	0	1	19	0	1000	339

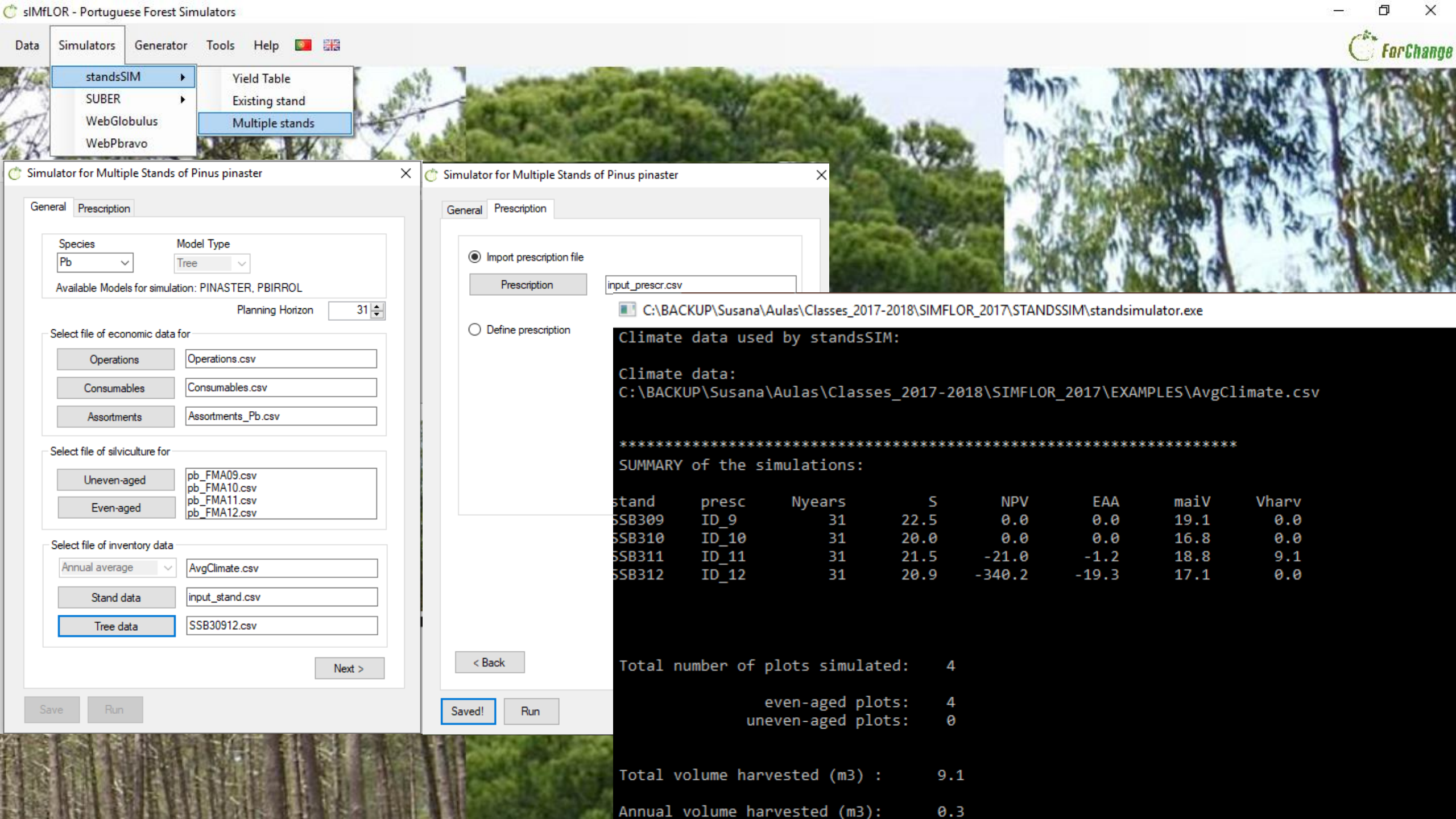
IdPrescr	NrCiclos	sp1	sp2	sp3	FMA	Opt	NyFMA	tlag	Npl	rot	tcut	nsprouts	t_nsprouts	in_type	t_last
ID_9	1	Pb	Pb	Pb	4	1	51	0	0	1	51	0	0	0	0
ID_10	1	Pb	Pb	Pb	4	2	51	0	0	1	51	0	0	0	0
ID_11	1	Pb	Pb	Pb	4	3	51	0	0	1	51	0	0	0	0
ID_12	1	Pb	Pb	Pb	4	4	51	0	0	1	51	0	0	0	0

id_plot	id_arv	especie	d	h	arv_dom	cod_est
SSB309	1	Pb	0.6	0	0	0
SSB309	2	Pb	0.7	0	0	0
SSB309	3	Pb	0.7	0	0	0
SSB309	4	Pb	1	0	0	0
SSB309	5	Pb	1.1	0	0	0
SSB309	6	Pb	1.6	0	0	0
SSB309	7	Pb	1.75	0	0	0
SSB309	8	Pb	1.9	0	0	0
SSB309	9	Pb	1.9	0	0	0
SSB309	10	Pb	2.1	0	0	0
SSB309	11	Pb	2.1	0	0	0
SSB309	12	Pb	2.1	0	0	0
SSB309	13	Pb	2.15	0	0	0
SSB309	14	Pb	2.2	0	0	0
SSB309	15	Pb	2.25	4.15	0	0
SSB310	1	Pb	3.745	0	0	0
SSB310	2	Pb	3.8	0	0	0
SSB310	3	Pb	4.11	0	0	0
SSB310	4	Pb	4.26	0	0	0
SSB310	5	Pb	4.745	0	0	0
SSB310	6	Pb	4.9	0	0	0
SSB310	7	Pb	4.975	0	0	0
SSB310	8	Pb	4.975	0	0	0
SSB310	9	Pb	5.02	0	0	0
SSB310	10	Pb	5.02	0	0	0
SSB310	11	Pb	5.15	0	0	0
SSB310	12	Pb	5.15	7	0	0
SSB310	13	Pb	5.35	0	0	0
SSB310	14	Pb	5.35	0	0	0
SSB310	15	Pb	5.375	0	0	0
SSB311	1	Pb	2.085	0	0	0
SSB311	2	Pb	3.625	0	0	0
SSB311	3	Pb	3.79	0	0	0
SSB311	4	Pb	4.05	0	0	0
SSB311	5	Pb	4.505	0	0	0
SSB311	6	Pb	4.505	0	0	0
SSB311	7	Pb	4.505	0	0	0
SSB311	8	Pb	4.94	0	0	0
SSB311	9	Pb	4.985	0	0	0
SSB311	10	Pb	5.125	0	0	0
SSB311	11	Pb	5.175	0	0	0
SSB311	12	Pb	5.715	0	0	0
SSB311	13	Pb	5.715	0	0	0
SSB311	14	Pb	6.145	0	0	0
SSB311	15	Pb	6.395	0	0	0
SSB312	1	Pb	1.11	0	0	0
SSB312	2	Pb	2.645	0	0	0
SSB312	3	Pb	2.71	0	0	0
SSB312	4	Pb	3.19	0	0	0
SSB312	5	Pb	3.245	0	0	0
SSB312	6	Pb	3.305	0	0	0
SSB312	7	Pb	3.305	0	0	0



Make sure you are selecting all the input files from where you saved them. **Please Note** that by default you'll be directed to certain folders depending on the file (exº input_prescr.csv C:\...\SIMFLOR_2017\EXAMPLES\Pb

You can check the locations of the files in the file: Ini_standsSIM.csv C:\...\SIMFLOR_2017\STANDSSIM


sIMfLOR - Portuguese Forest Simulators
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standsSIM
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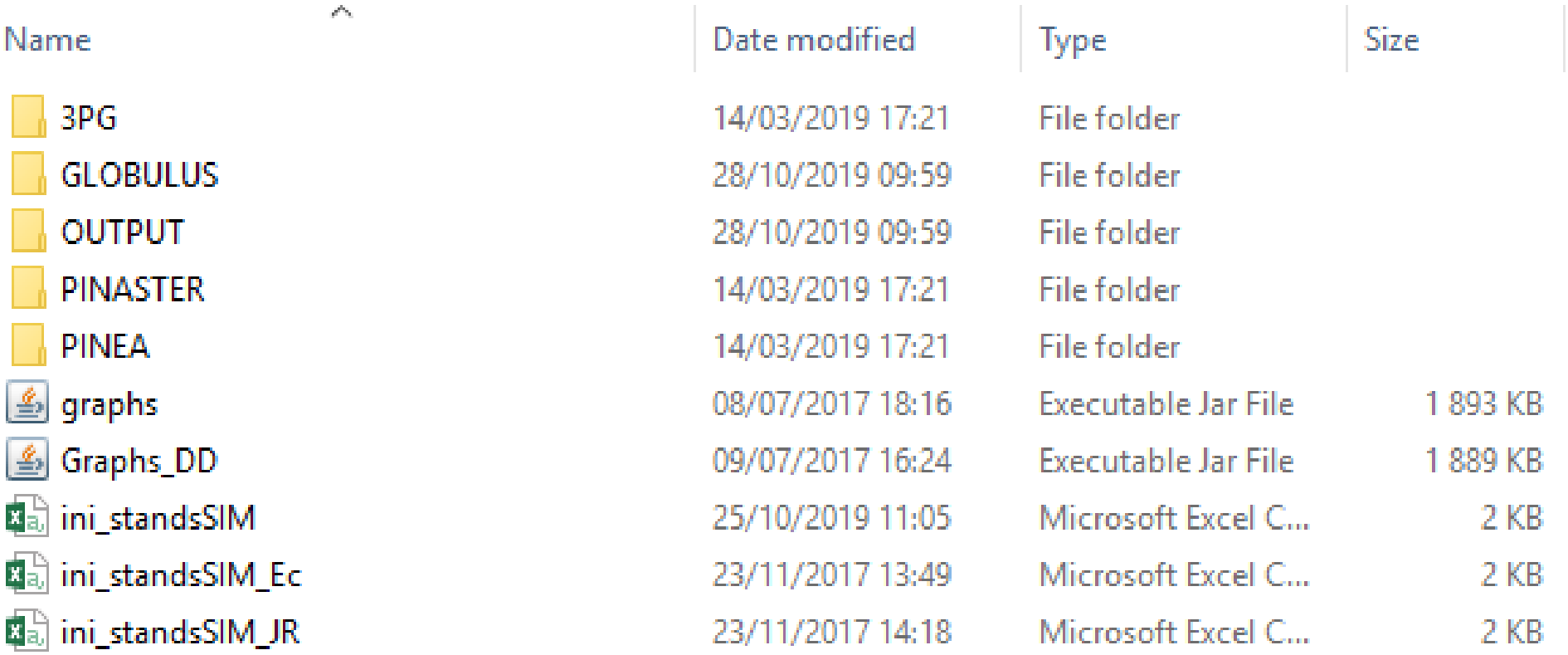
WebGlobulus
WebPbravo
Yield Table
Existing stand
Multiple stands
Simulator for Multiple Stands of Pinus pinaster
General
Prescription
Species
Pb
Model Type
Tree
Available Models for simulation: PINASTER, PBIRROL
Planning Horizon
31
Select file of economic data for
Operations
Operations.csv
Consumables
Consumables.csv
Assortments
Assortments_Pb.csv
Select file of silviculture for
Uneven-aged
Even-aged
pb_FMA09.csv
pb_FMA10.csv
pb_FMA11.csv
pb_FMA12.csv
Select file of inventory data
Annual average
AvgClimate.csv
Stand data
input_stand.csv
Tree data
SSB30912.csv
Next >
Save
Run
Simulator for Multiple Stands of Pinus pinaster
General
Prescription
Import prescription file
Prescription
input_prescr.csv
Define prescription
< Back
Saved!
Run
C:\BACKUP\Susana\Aulas\Classes_2017-2018\SIMFLOR_2017\STANDSSIM\standsimulator.exe
Climate data used by standsSIM:
Climate data:
C:\BACKUP\Susana\Aulas\Classes_2017-2018\SIMFLOR_2017\EXAMPLES\AvgClimate.csv
****
SUMMARY of the simulations:
stand presc Nyears S NPV EAA maiV Vharv
SSB309 ID_9 31 22.5 0.0 0.0 19.1 0.0
SSB310 ID_10 31 20.0 0.0 0.0 16.8 0.0
SSB311 ID_11 31 21.5 -21.0 -1.2 18.8 9.1
SSB312 ID_12 31 20.9 -340.2 -19.3 17.1 0.0
Total number of plots simulated: 4
even-aged plots: 4
uneven-aged plots: 0
Total volume harvested (m3) : 9.1
Annual volume harvested (m3): 0.3

Default files as those produced with the “Generator” are @:

\...\ SIMFLOR_2017 \ STANDSSIM



Name	Date modified	Type	Size
3PG	14/03/2019 17:21	File folder	
GLOBULUS	28/10/2019 09:59	File folder	
OUTPUT	28/10/2019 09:59	File folder	
PINASTER	14/03/2019 17:21	File folder	
PINEA	14/03/2019 17:21	File folder	
graphs	08/07/2017 18:16	Executable Jar File	1 893 KB
Graphs_DD	09/07/2017 16:24	Executable Jar File	1 889 KB
ini_standsSIM	25/10/2019 11:05	Microsoft Excel C...	2 KB
ini_standsSIM_Ec	23/11/2017 13:49	Microsoft Excel C...	2 KB
ini_standsSIM_JR	23/11/2017 14:18	Microsoft Excel C...	2 KB

output_YieldTable - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do...

H33 | 31

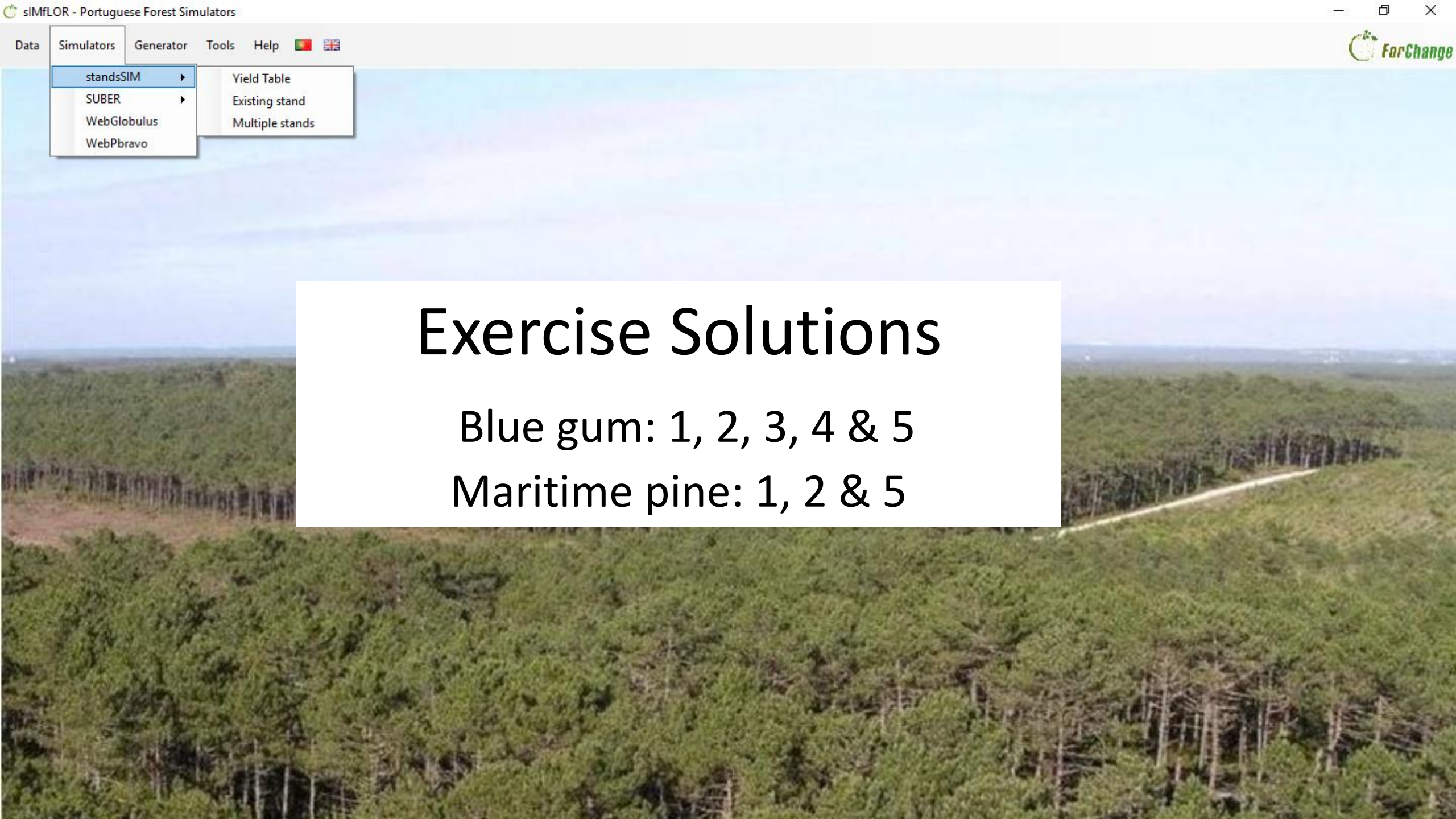
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1	id_stand	S	AreaUG	id_presc	FMA	opt	year	ttotal	t	rot	FinalCut	Thinning	Debark	hdom	Nst	N	Ndead	N_ing	Fw	G	dg	Vu_st	Vb_st	Vst	V	V_as1	V_as2
2	SSB309	22.45	1	ID_9	4	1	1981	0	19	1	0	0	0	12	3270	3270	0	0	0.15	26.9	10.2	94	40.9	3.7	138.6	0	0
3	SSB309	22.45	1	ID_9	4	1	1982	1	20	1	0																
4	SSB309	22.45	1	ID_9	4	1	1983	2	21	1	0																
5	SSB309	22.45	1	ID_9	4	1	1984	3	22	1	0																
6	SSB309	22.45	1	ID_9	4	1	1985	4	23	1	0																
7	SSB309	22.45	1	ID_9	4	1	1986	5	24	1	0																
8	SSB309	22.45	1	ID_9	4	1	1987	6	25	1	0																
9	SSB309	22.45	1	ID_9	4	1	1988	7	26	1	0																
10	SSB309	22.45	1	ID_9	4	1	1989	8	27	1	0																
11	SSB309	22.45	1	ID_9	4	1	1990	9	28	1	0																
12	SSB309	22.45	1	ID_9	4	1	1991	10	29	1	0																
13	SSB309	22.45	1	ID_9	4	1	1992	11	30	1	0																
14	SSB309	22.45	1	ID_9	4	1	1993	12	31	1	0																
15	SSB309	22.45	1	ID_9	4	1	1994	13	32	1	0																
16	SSB309	22.45	1	ID_9	4	1	1995	14	33	1	0																
17	SSB309	22.45	1	ID_9	4	1	1996	15	34	1	0																
18	SSB309	22.45	1	ID_9	4	1	1997	16	35	1	0																
19	SSB309	22.45	1	ID_9	4	1	1998	17	36	1	0																
20	SSB309	22.45	1	ID_9	4	1	1999	18	37	1	0																
21	SSB309	22.45	1	ID_9	4	1	2000	19	38	1	0																
22	SSB309	22.45	1	ID_9	4	1	2001	20	39	1	0																
23	SSB309	22.45	1	ID_9	4	1	2002	21	40	1	0																
24	SSB309	22.45	1	ID_9	4	1	2003	22	41	1	0																
25	SSB309	22.45	1	ID_9	4	1	2004	23	42	1	0																
26	SSB309	22.45	1	ID_9	4	1	2005	24	43	1	0																
27	SSB309	22.45	1	ID_9	4	1	2006	25	44	1	0																
28	SSB309	22.45	1	ID_9	4	1	2007	26	45	1	0																
29	SSB309	22.45	1	ID_9	4	1	2008	27	46	1	0	0	0	21.5	1310	1310	50	0	0.13	63.2	24.8	418.3	137.8	8.7	564.8	0	0
30	SSB309	22.45	1	ID_9	4	1	2009	28	47	1	0	0	0	21.7	1230	1230	100	0	0.13	62.5	25.4	420.5	137.7	8.6	566.8	0	0
31	SSB309	22.45	1	ID_9	4	1	2010	29	48	1	0	0	0	22	1200	1200	30	0	0.13	63.1	25.9	429.2	139.9	8.7	577.9	0	0
32	SSB309	22.45	1	ID_9	4	1	2011	30	49	1	0	0	0	22.2	1140	1140	70	0	0.13	63.2	26.6	436.1	141.3	8.7	586.2	0	0
33	SSB309	22.45	1	ID_9	4	1	2012	31	50	1	0	0	0	22.5	1090	1090	60	0	0.13	63.2	27.2	441.8	142.4	8.7	593	0	0
34	SSB310	20.02	1	ID_10	4	1	1981	0	19	1	0	0	0	10	3440	3440	0	0	0.17	26.2	9.9	78.7	36.8	3.7	119.2	0	0
35	SSB310	20.02	1	ID_10	4	1	1982	1	20	1	0	0	0	10.5	3440	3440	0	0	0.16	28.8	10.3	88.3	41	4	133.2	0	0

Please Note that when running for several stands the output_yieldtable.csv will contain the simulation runs,
but the graphs option will not be available under this simulation mode

If you want to see the graphs for each of the plots you will have to:

1) copy the output_yieldtable.csv file and save it with a different name (exº output_yieldtable_allPlots.csv)
2) then leave only the simulation run results for the plot you want to make the graphs for deleting the remaining plots in the output_yieldtable.csv
3) Then click on the **graphs.jar** program in: C:\...\SIMFLOR_2017\STANDSSIM
4) For the diameter distribution graphs click on the **graphs_DD.jar** program

The graphs will be made for the plot you left inside the output_yieldtable.csv.
You can replace the content of this file by as many plots you want to build the graphs for.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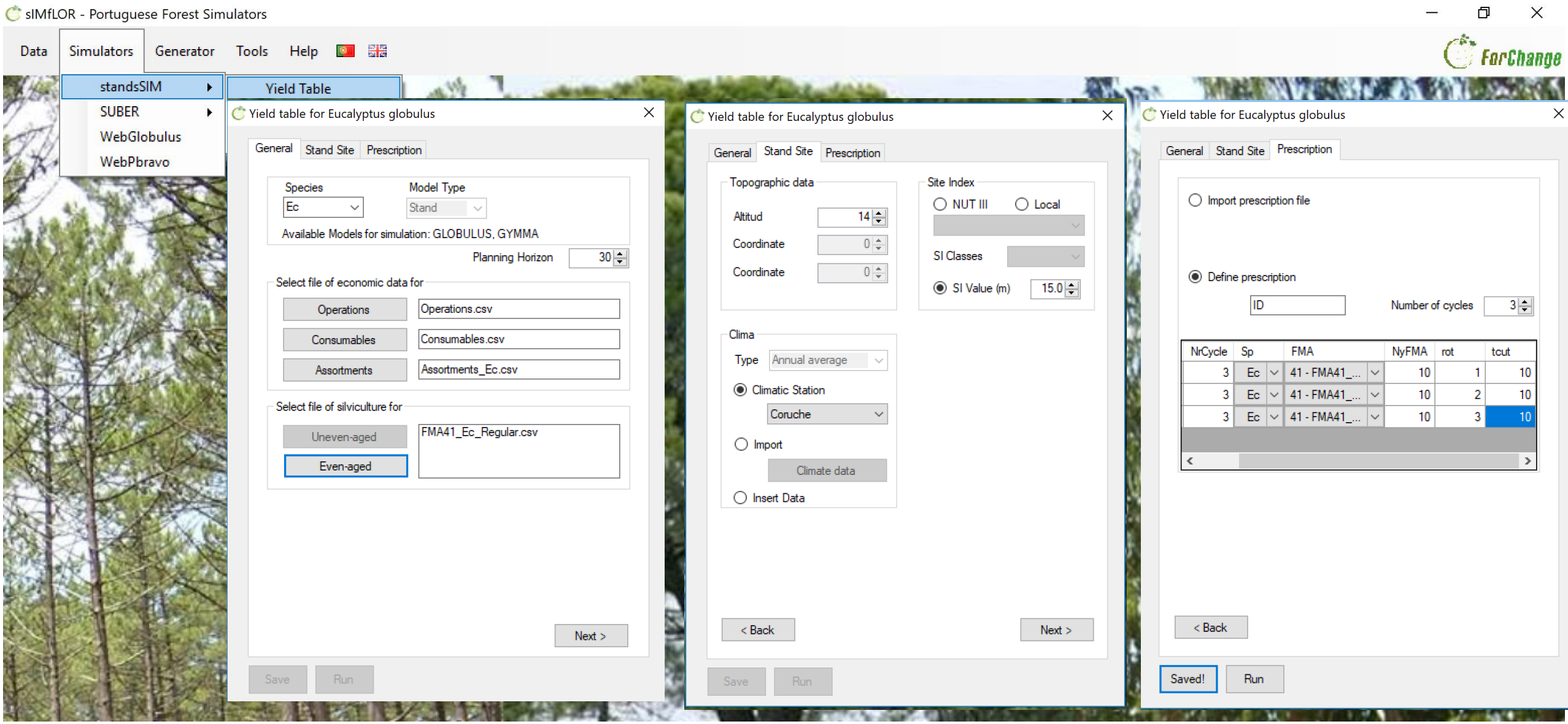
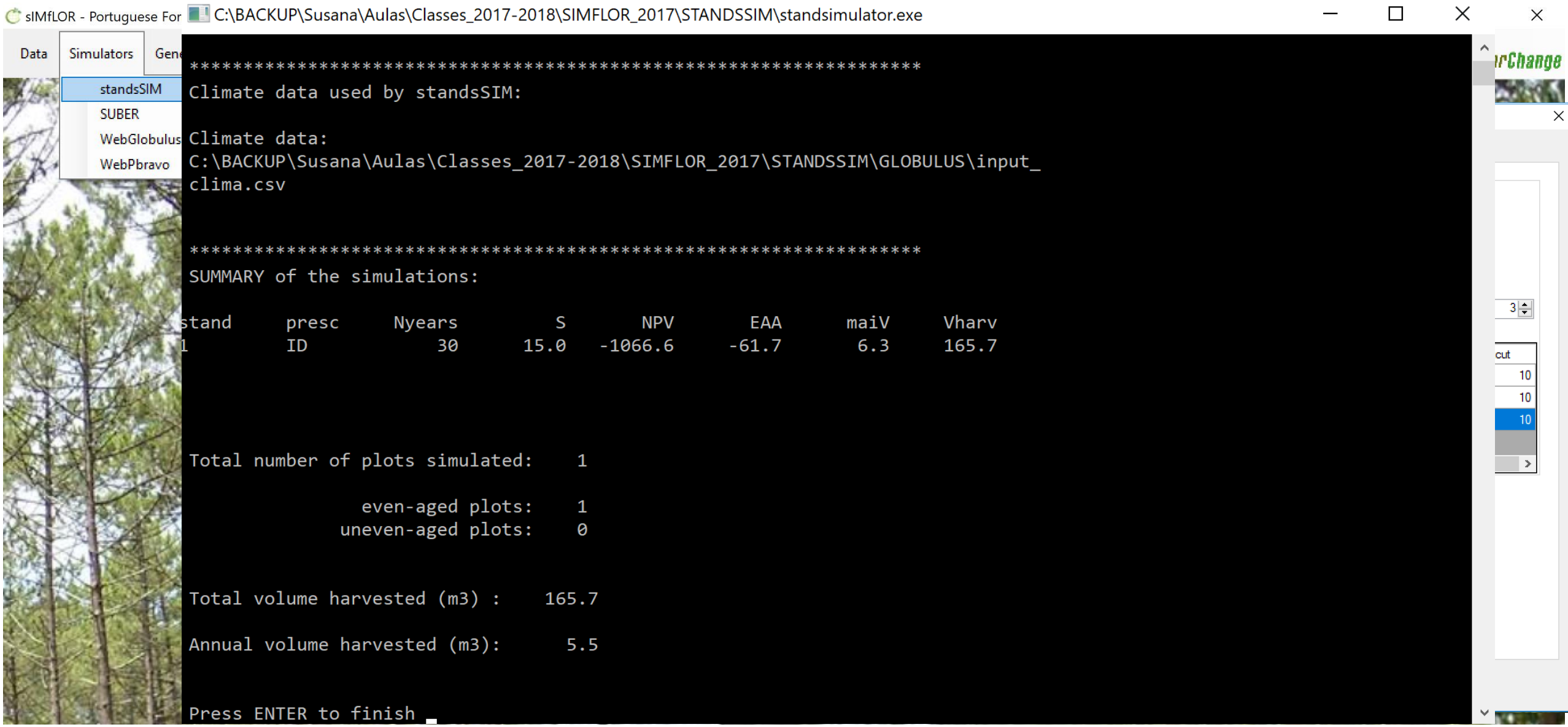
Multiple stands
ForChange
Exercise Solutions
Blue gum: 1, 2, 3, 4 & 5
Maritime pine: 1, 2 & 5

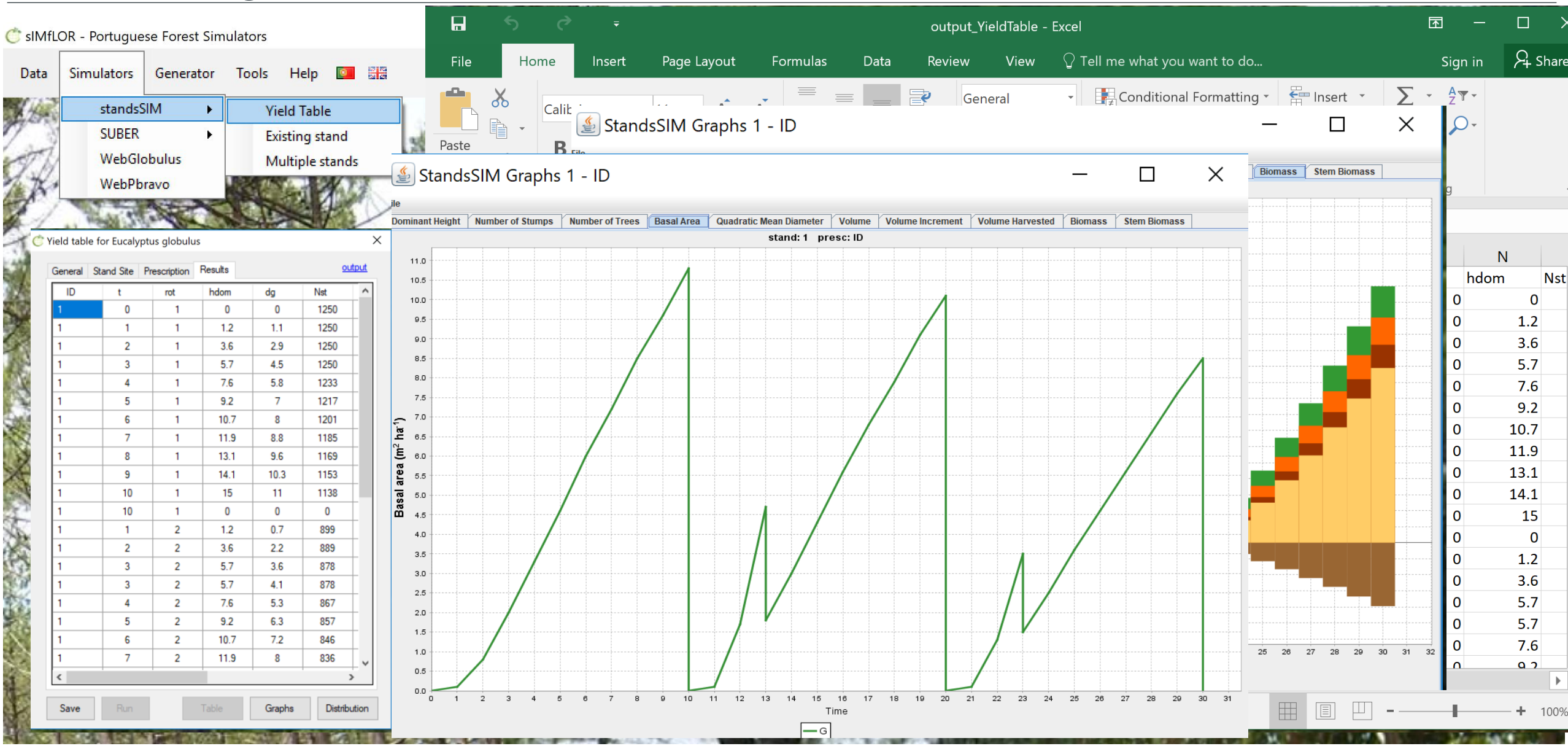
Blue gum - Exercise 1 solution



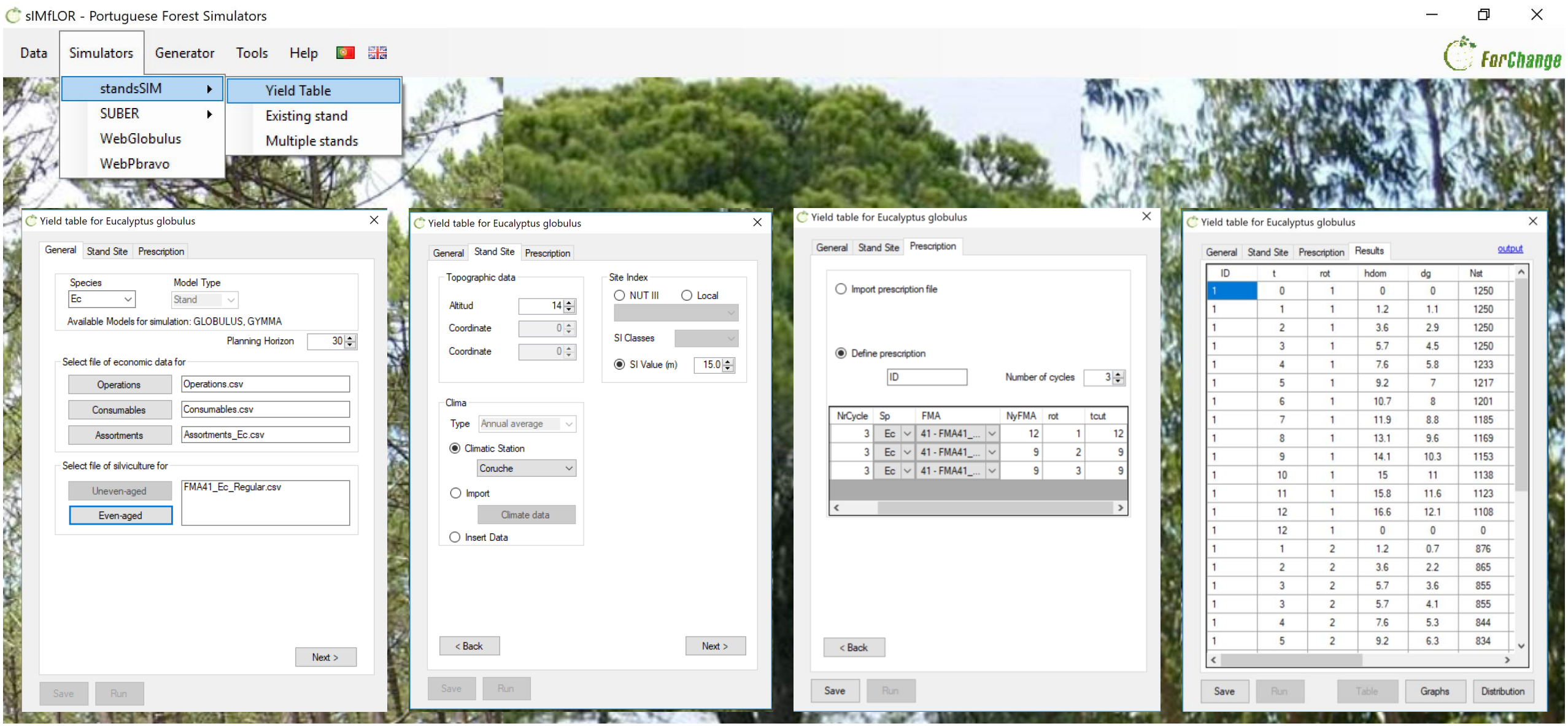
Blue gum - Exercise 1 solution



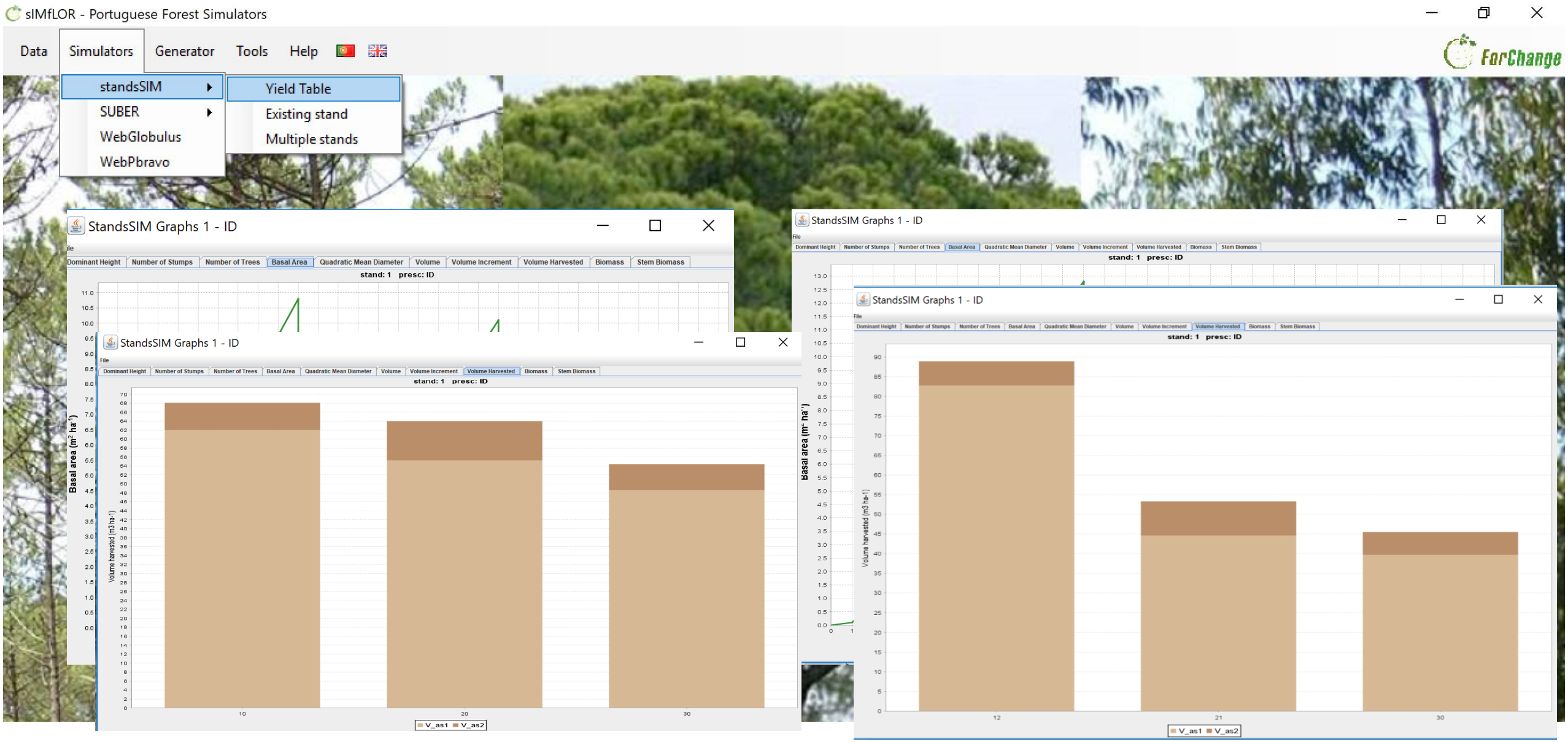
Blue gum - Exercise 1 solution



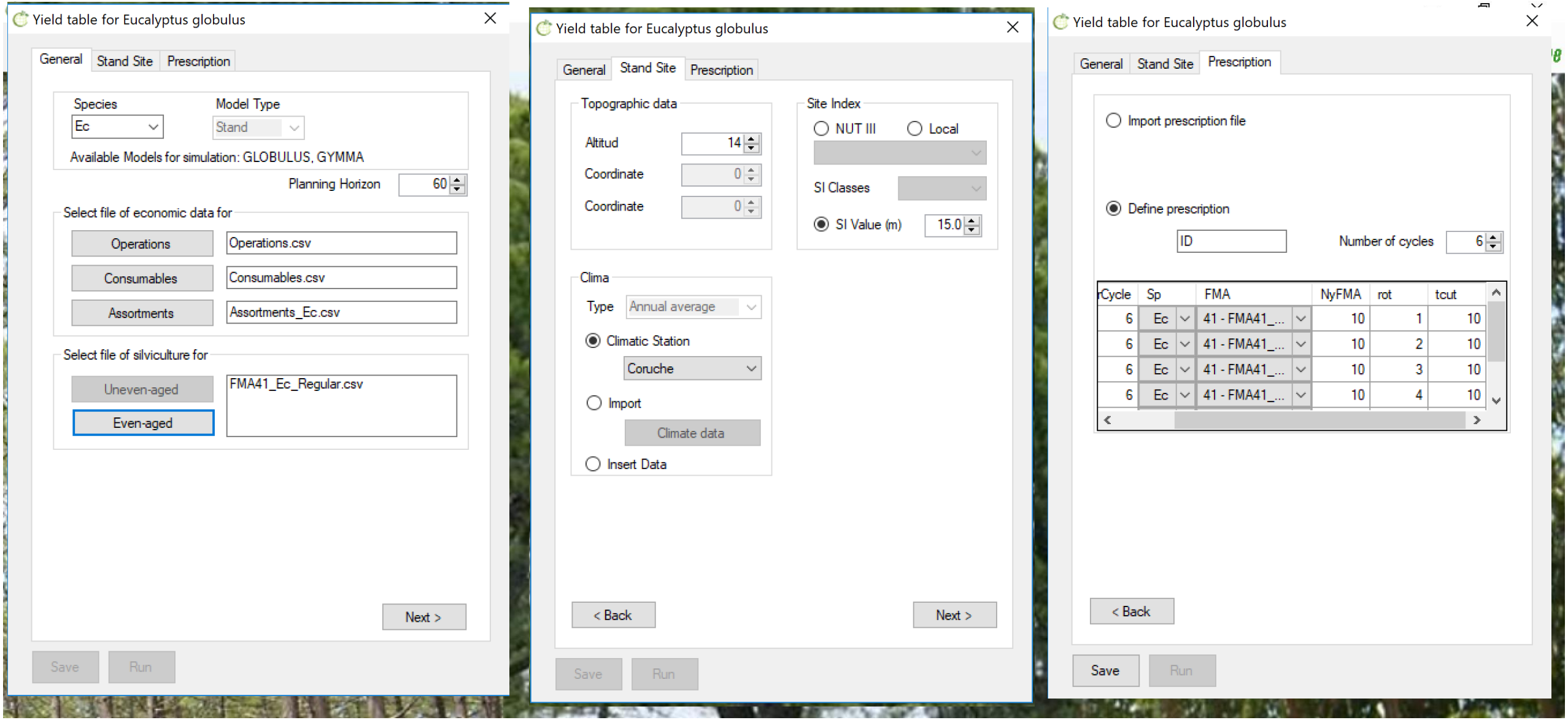
Blue gum - Exercise 2 solution



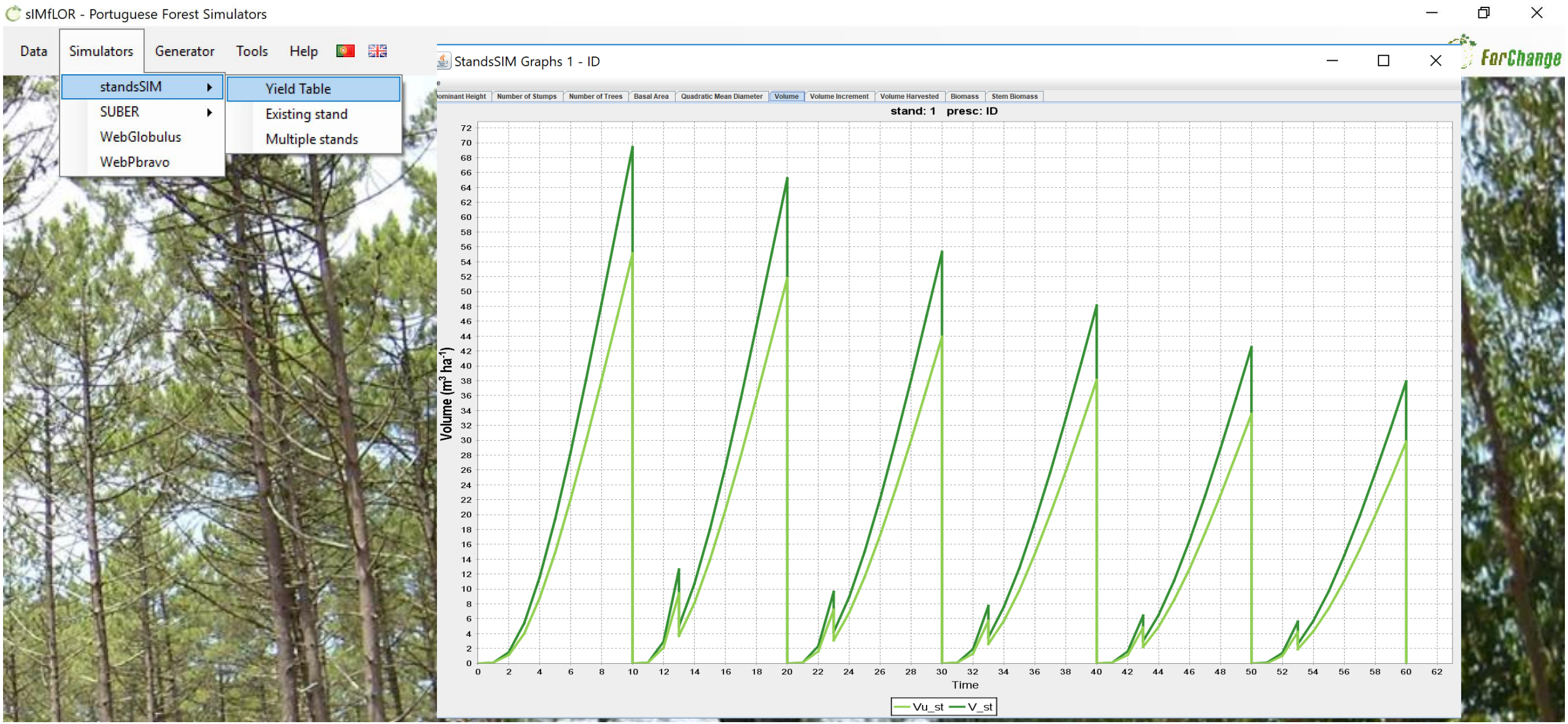
Blue gum - Exercise 2 solution



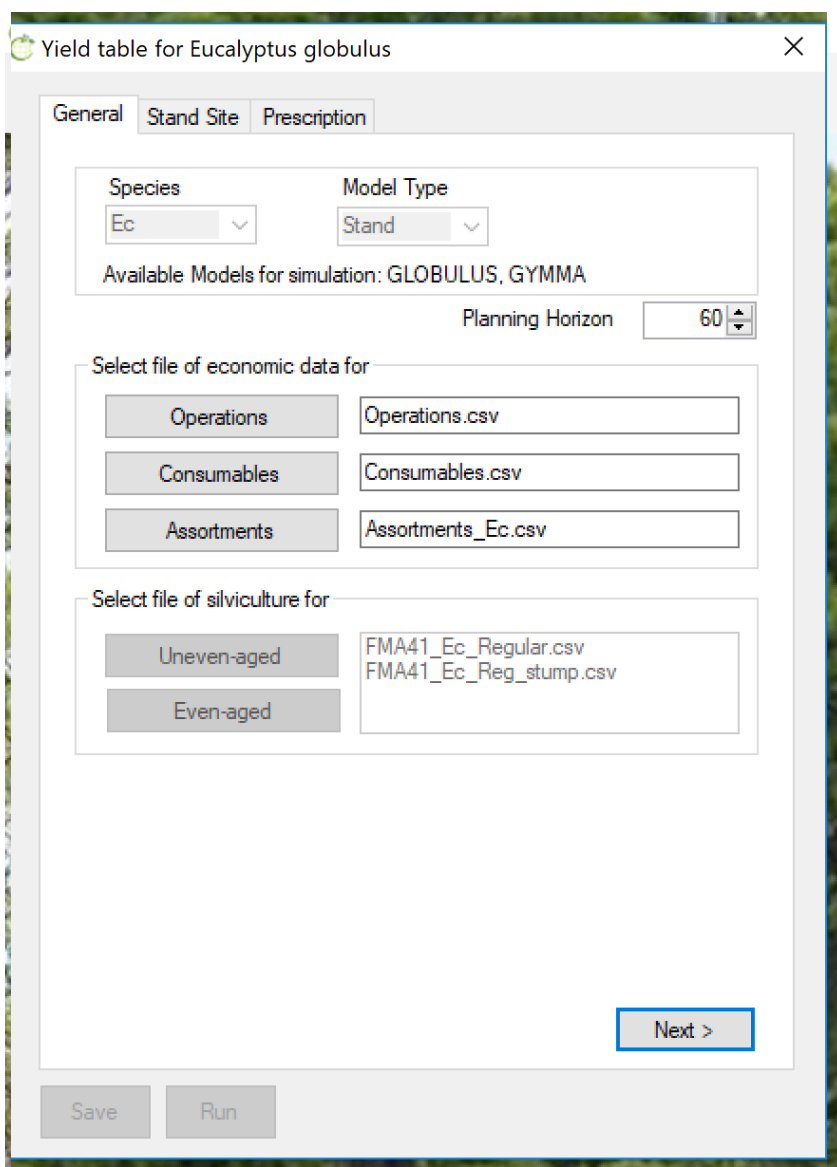
Blue gum - Exercise 3 solution (option a)

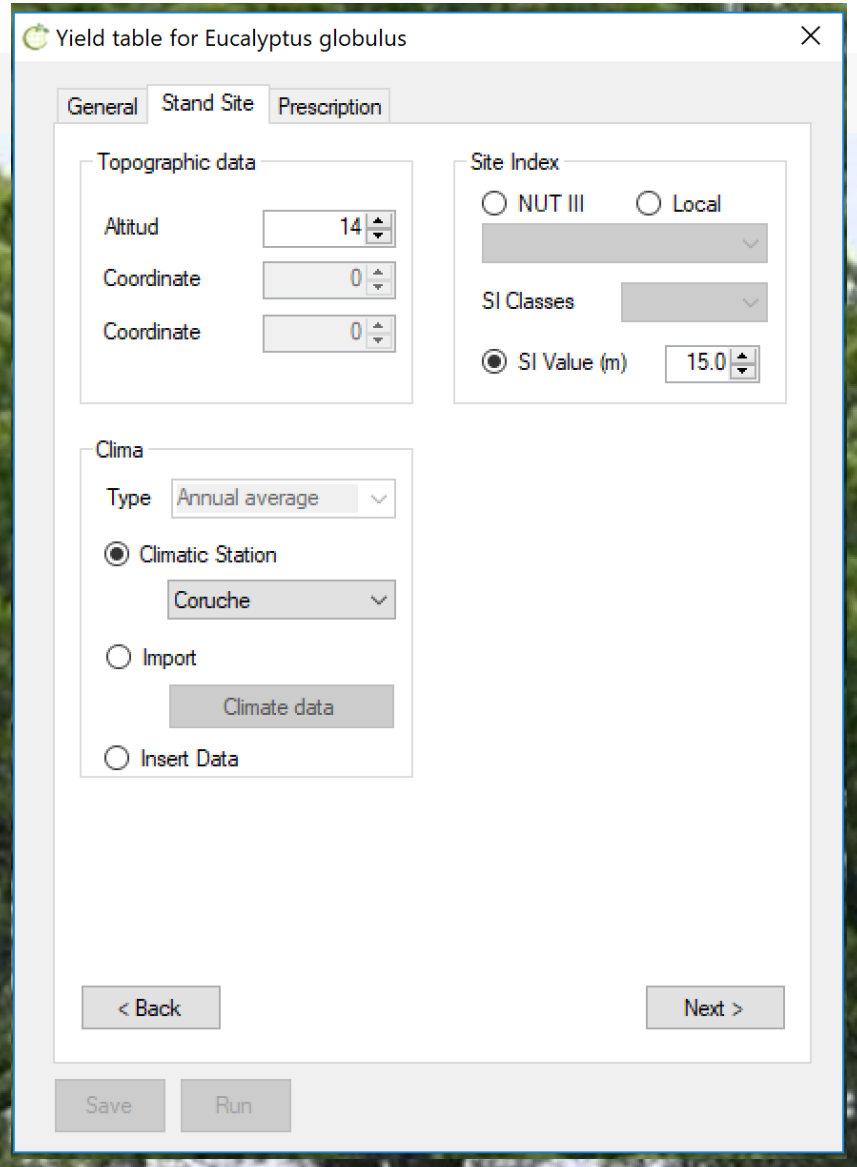


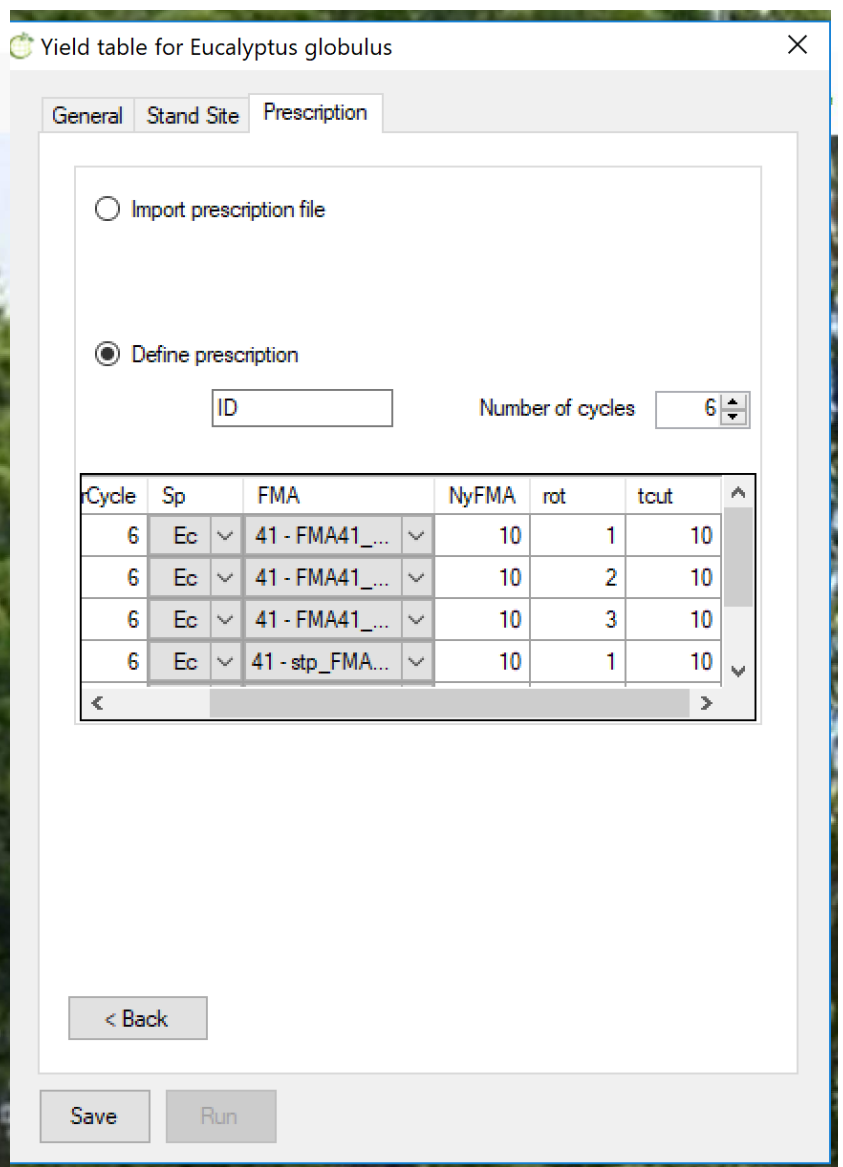
Blue gum - Exercise 3 solution (option a)



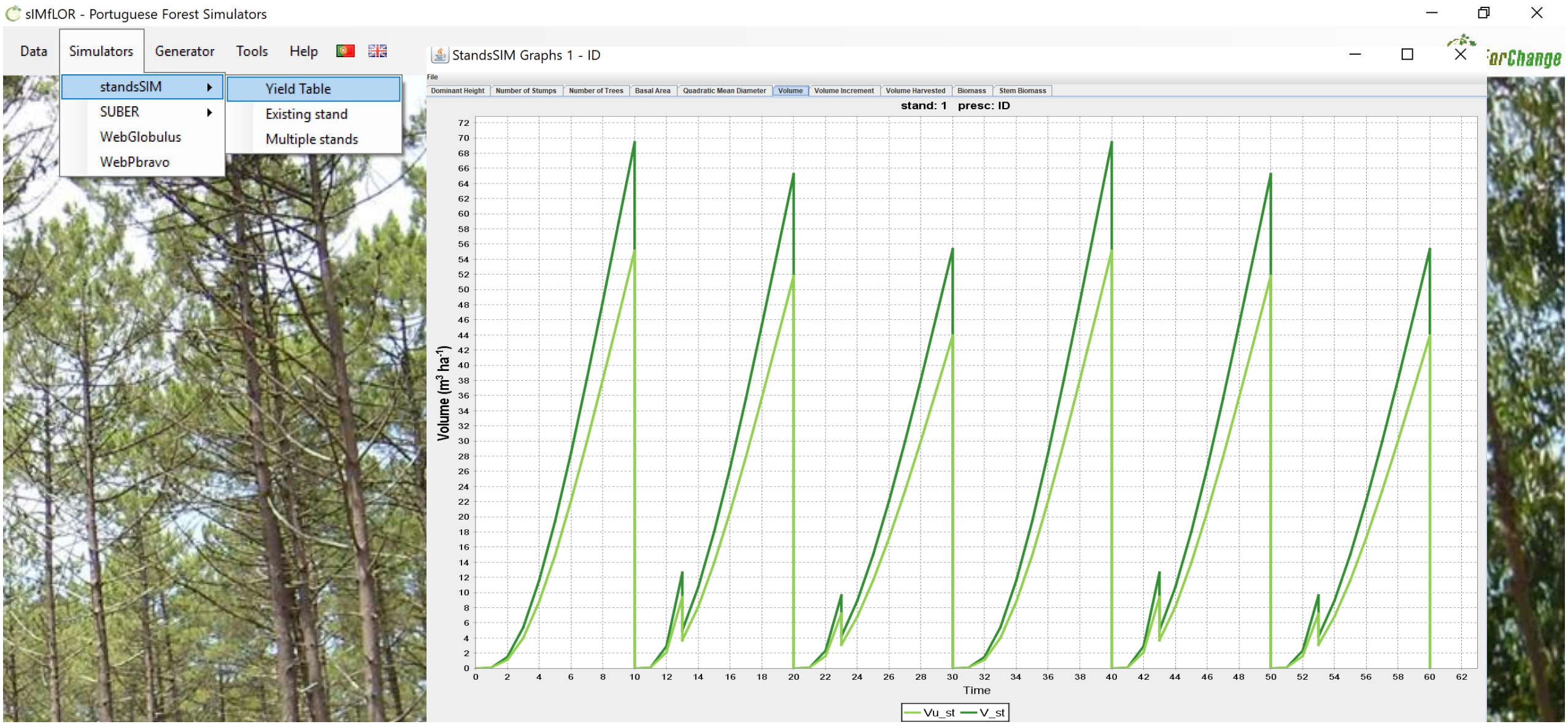
Blue gum - Exercise 3 solution (option b)



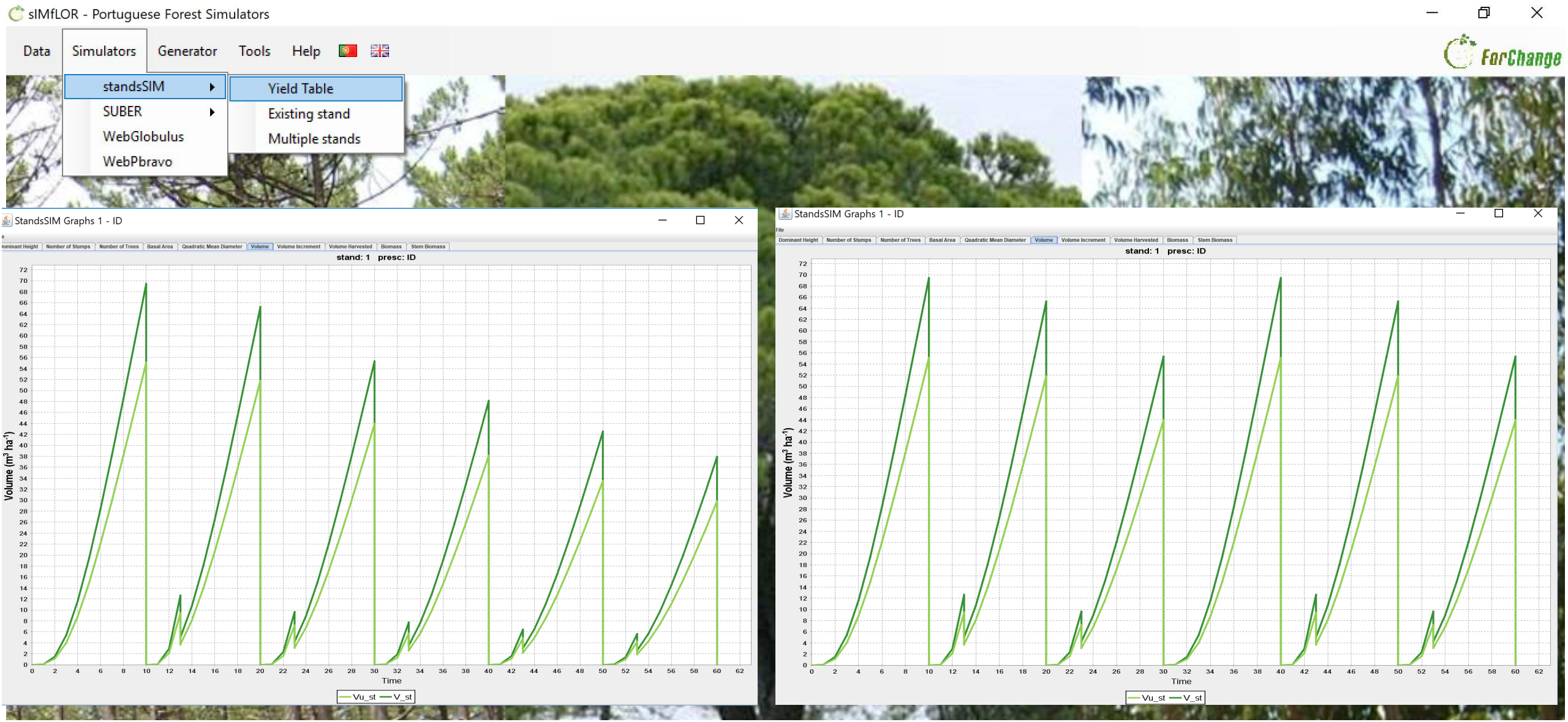




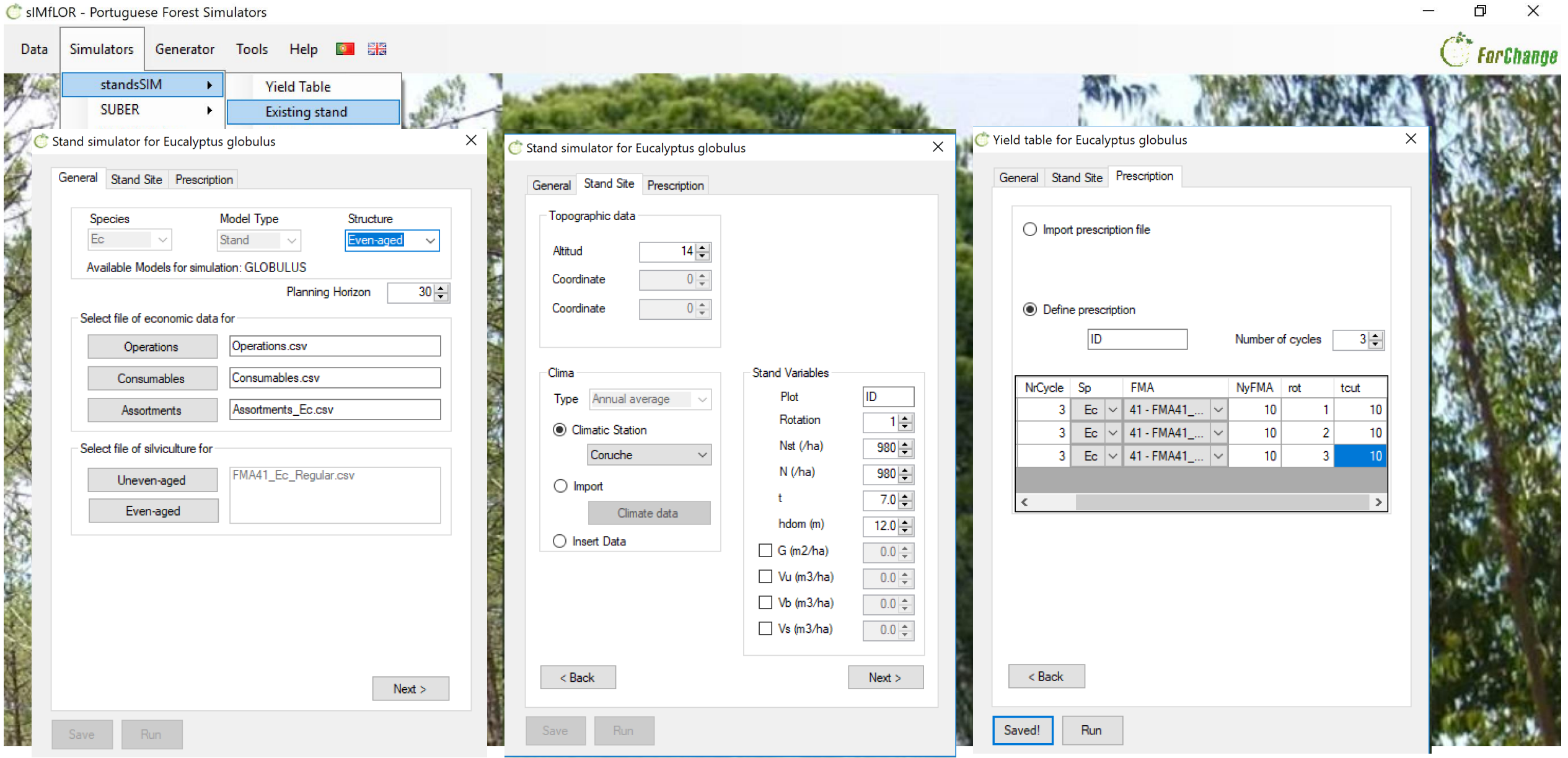
Blue gum - Exercise 3 solution (option b)



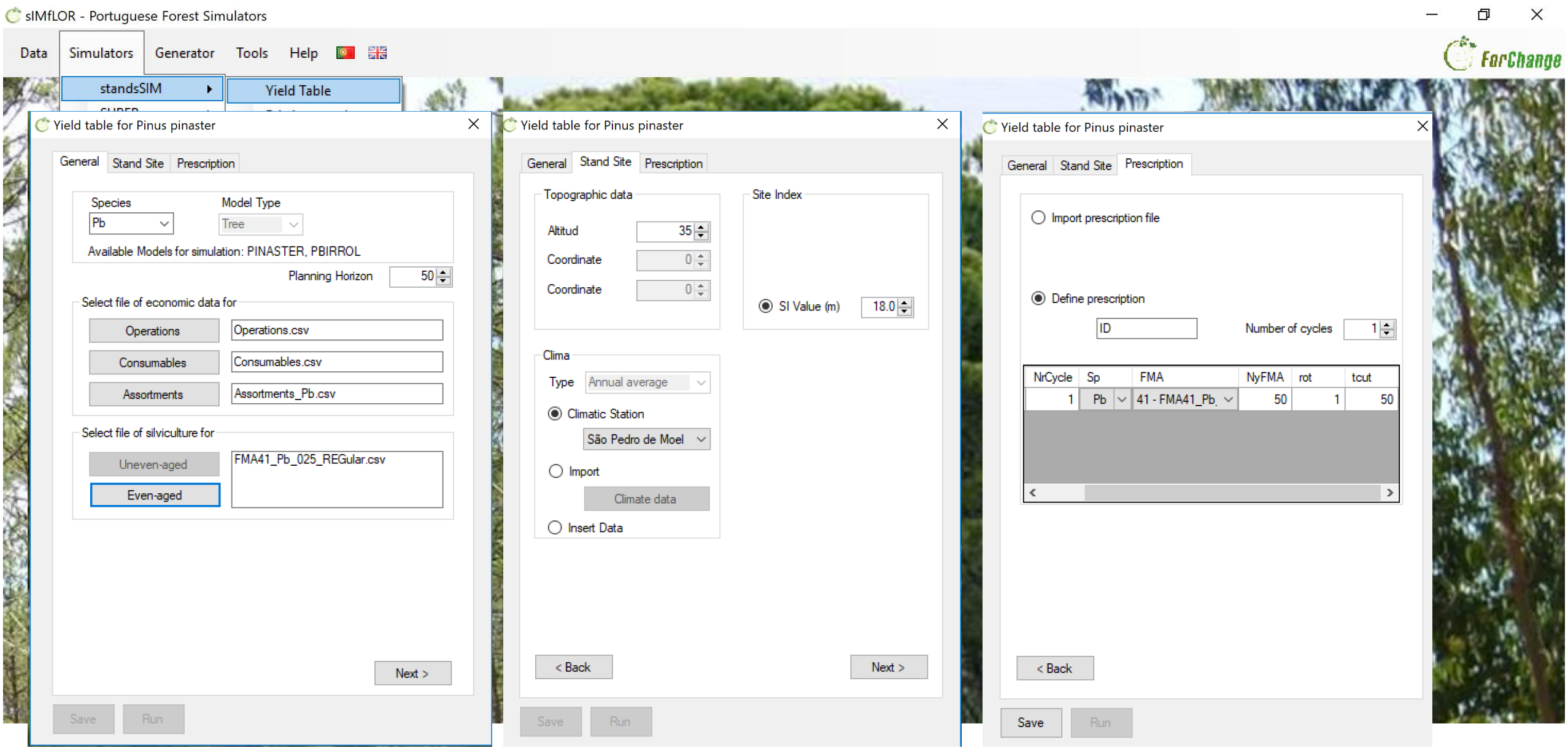
Blue gum - Exercise 3 solution (options a & b)



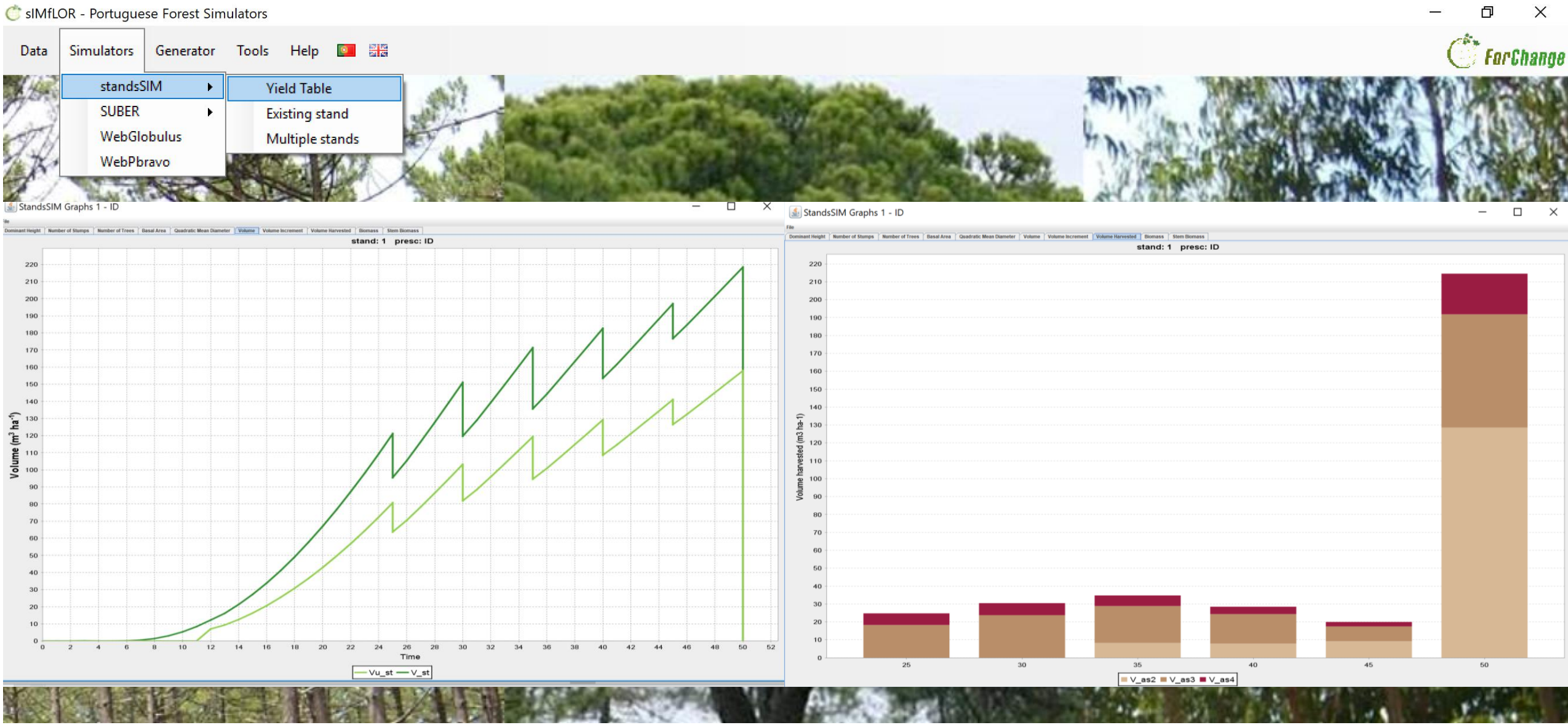
Blue gum - Exercise 4 solution



Maritime pine - Exercise 1 solution

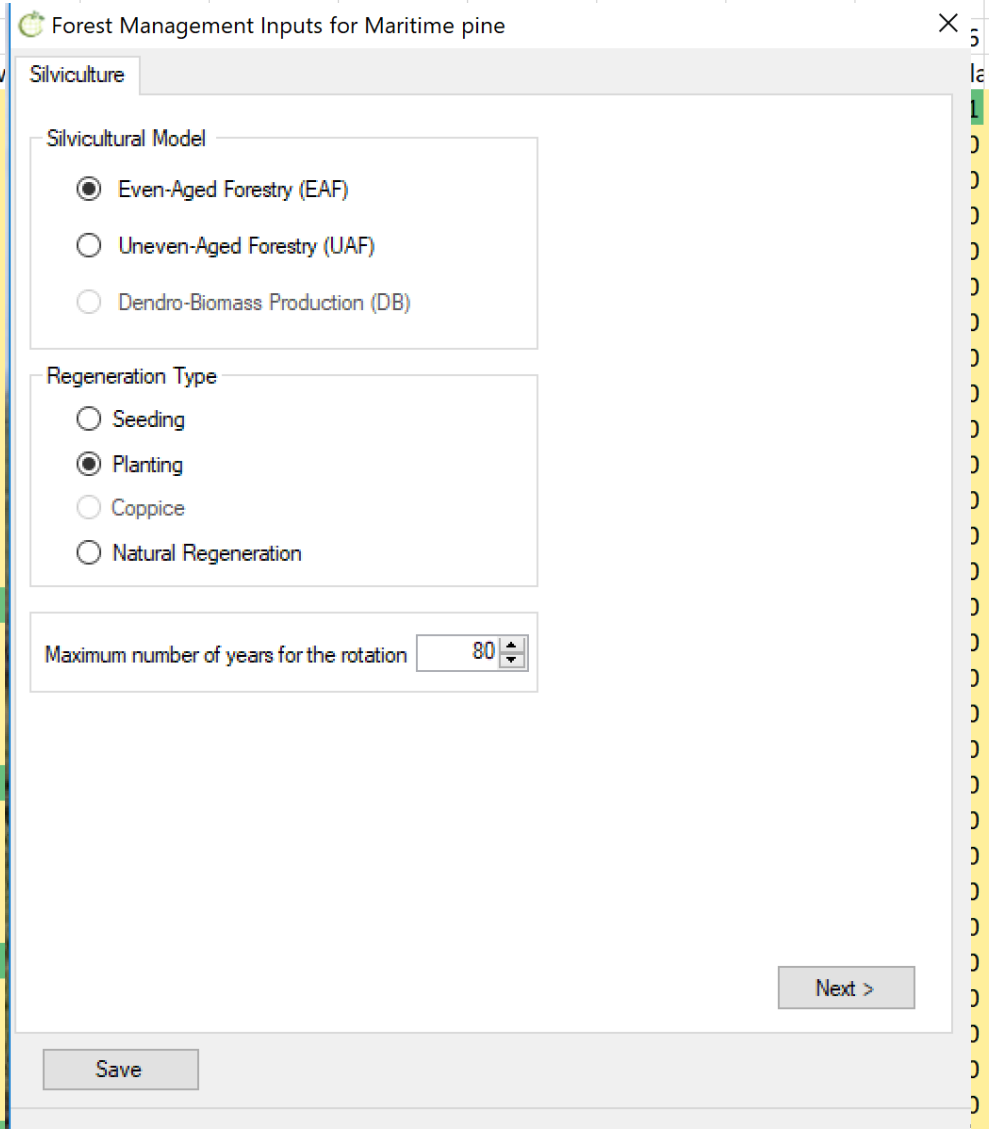


Maritime pine - Exercise 1 solution



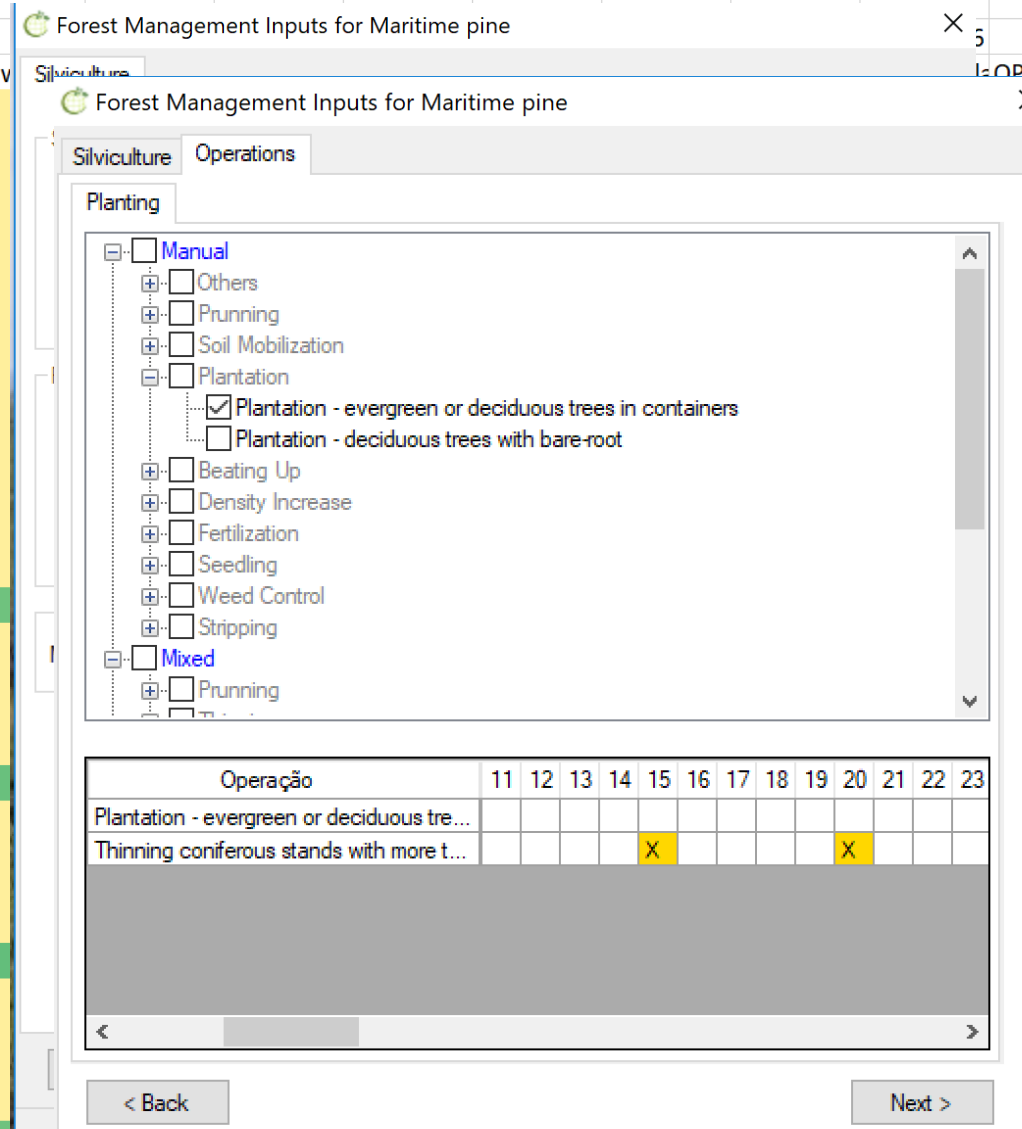
Maritime pine - Exercise1 solution

	A	B	C	D	E	F	G	H	I	J	K	L
1		4										
2		1										
3		80										
4	T	Npl	Mortality	BeatUp	ShootSel	DensIncr	StripIncr	Prunn	ThType	ThGres	ThGrem	ThFv
5	1	2500	0	0	0	0	0	0	0	0	0	
6	2	0	0	0	0	0	0	0	0	0	0	
7	3	0	0	0	0	0	0	0	0	0	0	
8	4	0	0	0	0	0	0	0	0	0	0	
9	5	0	0	0	0	0	0	0	0	0	0	
10	6	0	0	0	0	0	0	0	0	0	0	
11	7	0	0	0	0	0	0	0	0	0	0	
12	8	0	0	0	0	0	0	0	0	0	0	
13	9	0	0	0	0	0	0	0	0	0	0	
14	10	0	0	0	0	0	0	0	0	0	0	
15	11	0	0	0	0	0	0	0	0	0	0	
16	12	0	0	0	0	0	0	0	0	0	0	
17	13	0	0	0	0	0	0	0	0	0	0	
18	14	0	0	0	0	0	0	0	0	0	0	
19	15	0	0	0	0	0	0	0	1	0	0	
20	16	0	0	0	0	0	0	0	0	0	0	
21	17	0	0	0	0	0	0	0	0	0	0	
22	18	0	0	0	0	0	0	0	0	0	0	
23	19	0	0	0	0	0	0	0	0	0	0	
24	20	0	0	0	0	0	0	0	2	0	0	
25	21	0	0	0	0	0	0	0	0	0	0	
26	22	0	0	0	0	0	0	0	0	0	0	
27	23	0	0	0	0	0	0	0	0	0	0	
28	24	0	0	0	0	0	0	0	0	0	0	
29	25	0	0	0	0	0	0	0	3	0	0	
30	26	0	0	0	0	0	0	0	0	0	0	
31	27	0	0	0	0	0	0	0	0	0	0	
32	28	0	0	0	0	0	0	0	0	0	0	
33	29	0	0	0	0	0	0	0	0	0	0	



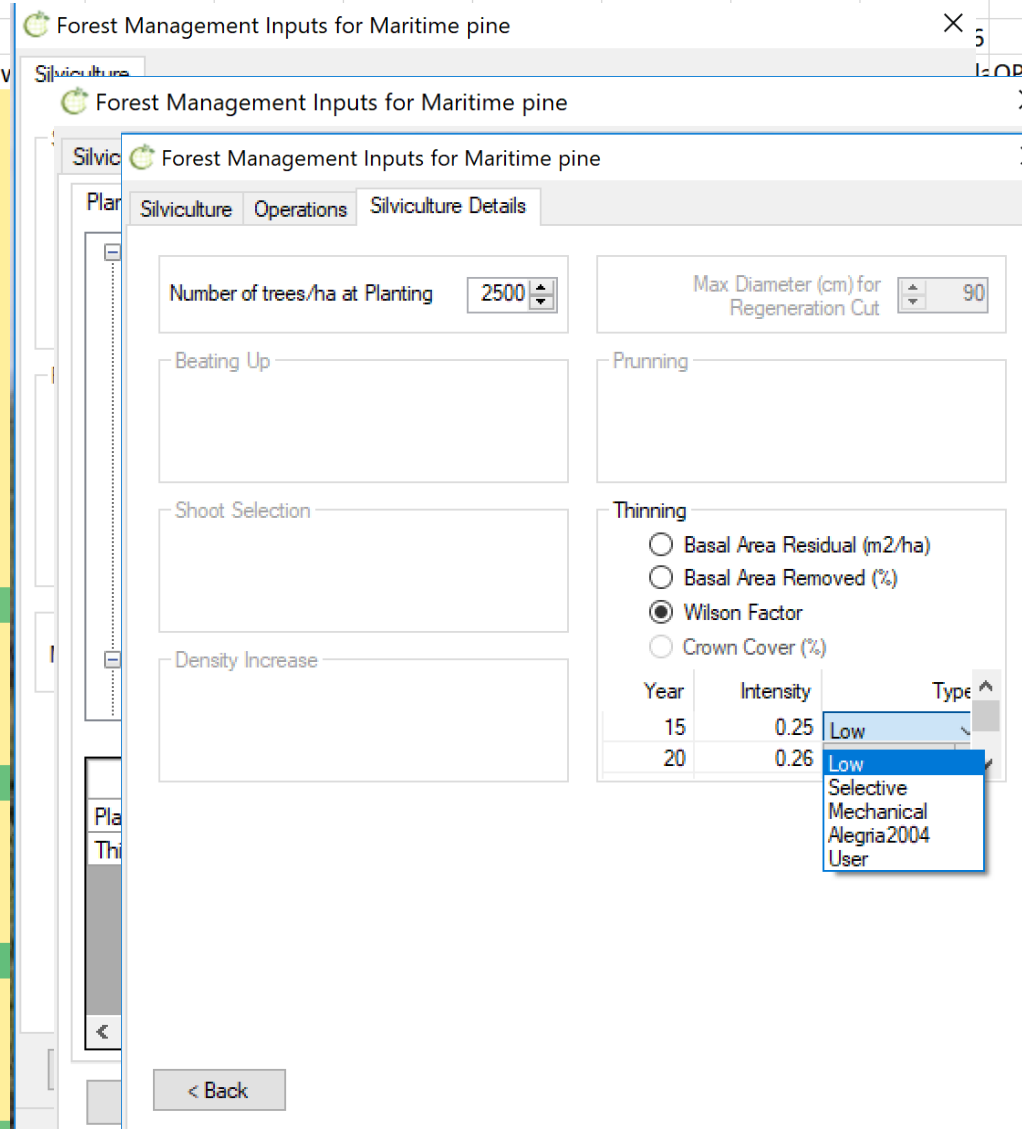
Maritime pine - Exercise1 solution

	A	B	C	D	E	F	G	H	I	J	K	L
1	4											
2	1											
3	80											
4	T	Npl	Mortality	BeatUp	ShootSel	DensIncr	StripIncr	Prunn	ThType	ThGres	ThGrem	ThFv
5	1	2500	0	0	0	0	0	0	0	0	0	
6	2	0	0	0	0	0	0	0	0	0	0	
7	3	0	0	0	0	0	0	0	0	0	0	
8	4	0	0	0	0	0	0	0	0	0	0	
9	5	0	0	0	0	0	0	0	0	0	0	
10	6	0	0	0	0	0	0	0	0	0	0	
11	7	0	0	0	0	0	0	0	0	0	0	
12	8	0	0	0	0	0	0	0	0	0	0	
13	9	0	0	0	0	0	0	0	0	0	0	
14	10	0	0	0	0	0	0	0	0	0	0	
15	11	0	0	0	0	0	0	0	0	0	0	
16	12	0	0	0	0	0	0	0	0	0	0	
17	13	0	0	0	0	0	0	0	0	0	0	
18	14	0	0	0	0	0	0	0	0	0	0	
19	15	0	0	0	0	0	0	0	1	0	0	
20	16	0	0	0	0	0	0	0	0	0	0	
21	17	0	0	0	0	0	0	0	0	0	0	
22	18	0	0	0	0	0	0	0	0	0	0	
23	19	0	0	0	0	0	0	0	0	0	0	
24	20	0	0	0	0	0	0	0	2	0	0	
25	21	0	0	0	0	0	0	0	0	0	0	
26	22	0	0	0	0	0	0	0	0	0	0	
27	23	0	0	0	0	0	0	0	0	0	0	
28	24	0	0	0	0	0	0	0	0	0	0	
29	25	0	0	0	0	0	0	0	3	0	0	
30	26	0	0	0	0	0	0	0	0	0	0	
31	27	0	0	0	0	0	0	0	0	0	0	
32	28	0	0	0	0	0	0	0	0	0	0	
33	29	0	0	0	0	0	0	0	0	0	0	

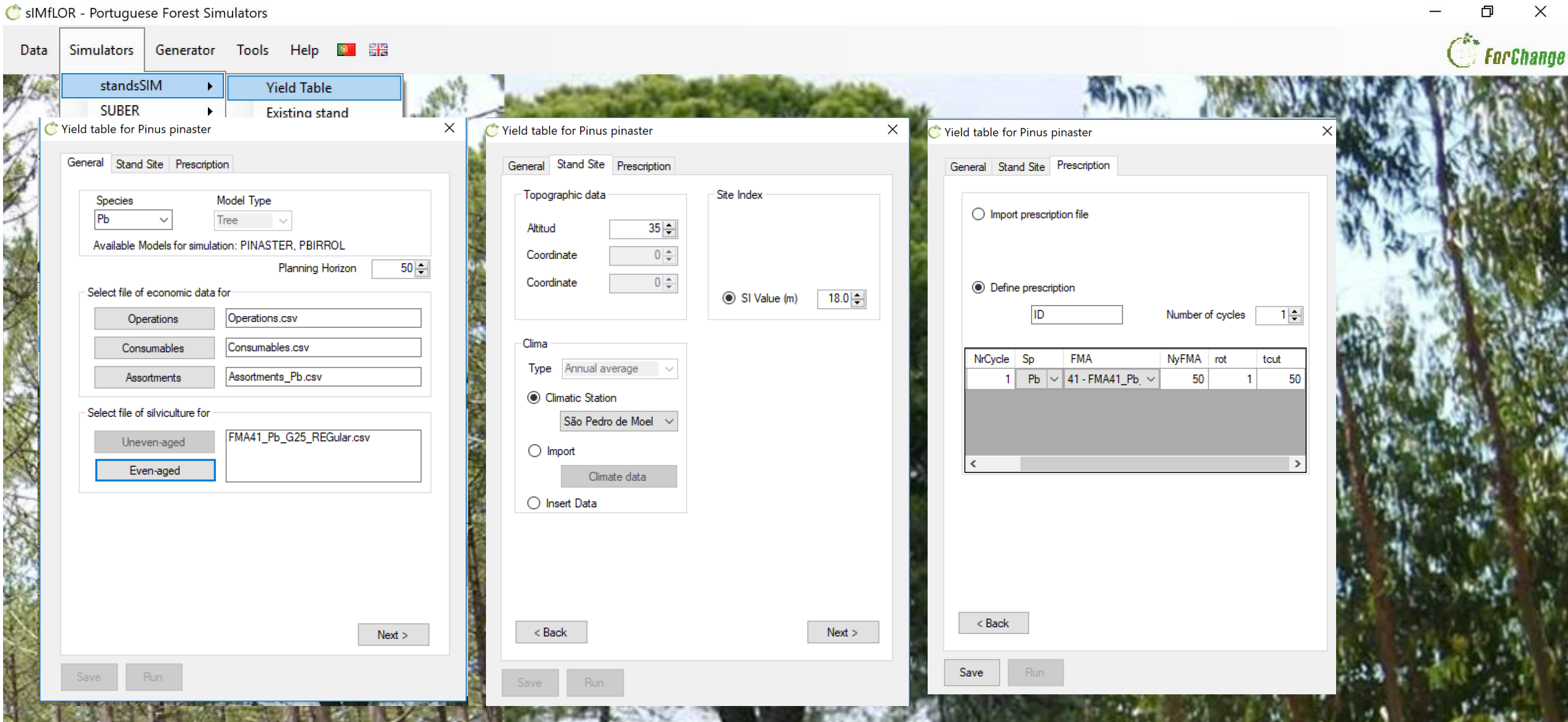


Maritime pine - Exercise1 solution

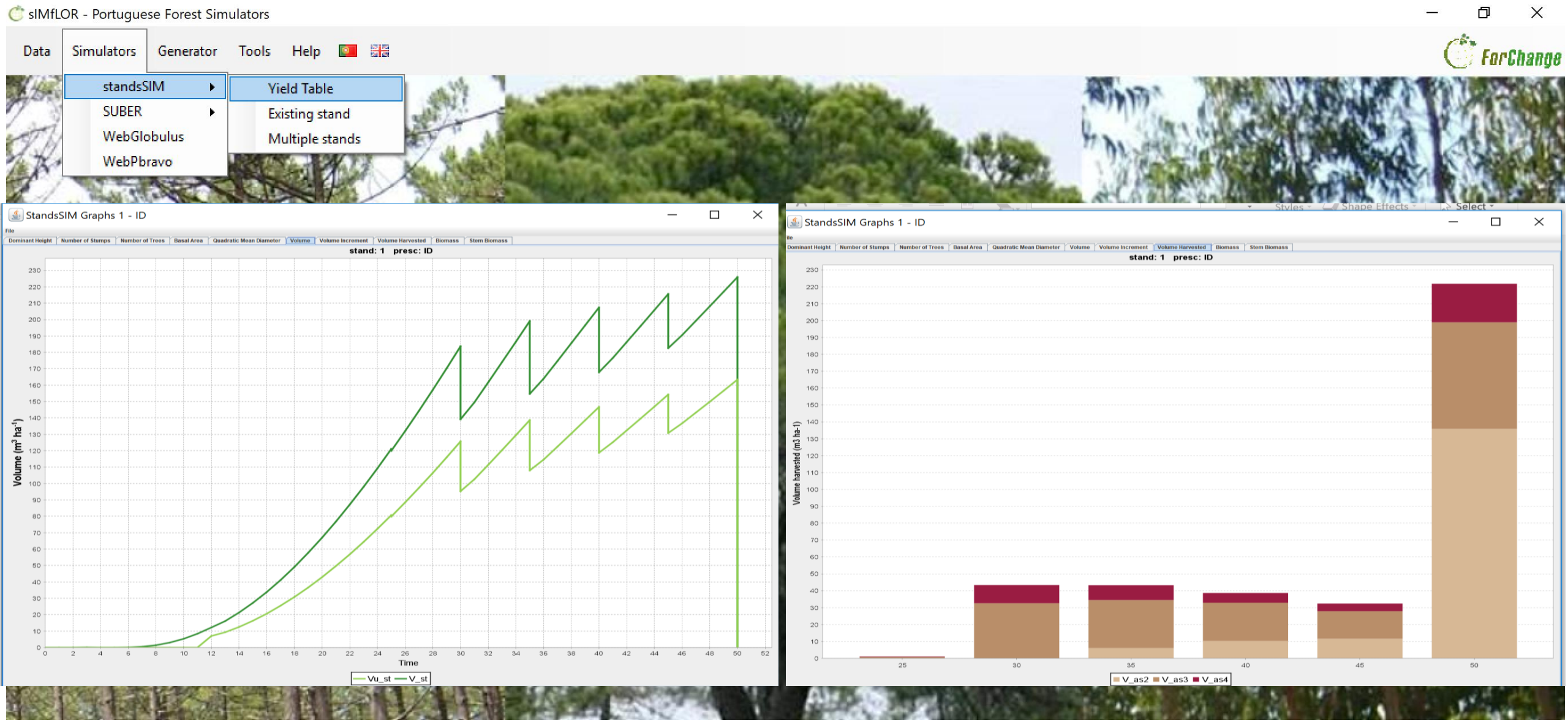
	A	B	C	D	E	F	G	H	I	J	K	L
1	4											
2	1											
3	80											
4	T	Npl	Mortality	BeatUp	ShootSel	DensIncr	StripIncr	Prunn	ThType	ThGres	ThGrem	ThFv
5	1	2500	0	0	0	0	0	0	0	0	0	
6	2	0	0	0	0	0	0	0	0	0	0	
7	3	0	0	0	0	0	0	0	0	0	0	
8	4	0	0	0	0	0	0	0	0	0	0	
9	5	0	0	0	0	0	0	0	0	0	0	
10	6	0	0	0	0	0	0	0	0	0	0	
11	7	0	0	0	0	0	0	0	0	0	0	
12	8	0	0	0	0	0	0	0	0	0	0	
13	9	0	0	0	0	0	0	0	0	0	0	
14	10	0	0	0	0	0	0	0	0	0	0	
15	11	0	0	0	0	0	0	0	0	0	0	
16	12	0	0	0	0	0	0	0	0	0	0	
17	13	0	0	0	0	0	0	0	0	0	0	
18	14	0	0	0	0	0	0	0	0	0	0	
19	15	0	0	0	0	0	0	0	1	0	0	
20	16	0	0	0	0	0	0	0	0	0	0	
21	17	0	0	0	0	0	0	0	0	0	0	
22	18	0	0	0	0	0	0	0	0	0	0	
23	19	0	0	0	0	0	0	0	0	0	0	
24	20	0	0	0	0	0	0	0	2	0	0	
25	21	0	0	0	0	0	0	0	0	0	0	
26	22	0	0	0	0	0	0	0	0	0	0	
27	23	0	0	0	0	0	0	0	0	0	0	
28	24	0	0	0	0	0	0	0	0	0	0	
29	25	0	0	0	0	0	0	0	3	0	0	
30	26	0	0	0	0	0	0	0	0	0	0	
31	27	0	0	0	0	0	0	0	0	0	0	
32	28	0	0	0	0	0	0	0	0	0	0	
33	29	0	0	0	0	0	0	0	0	0	0	



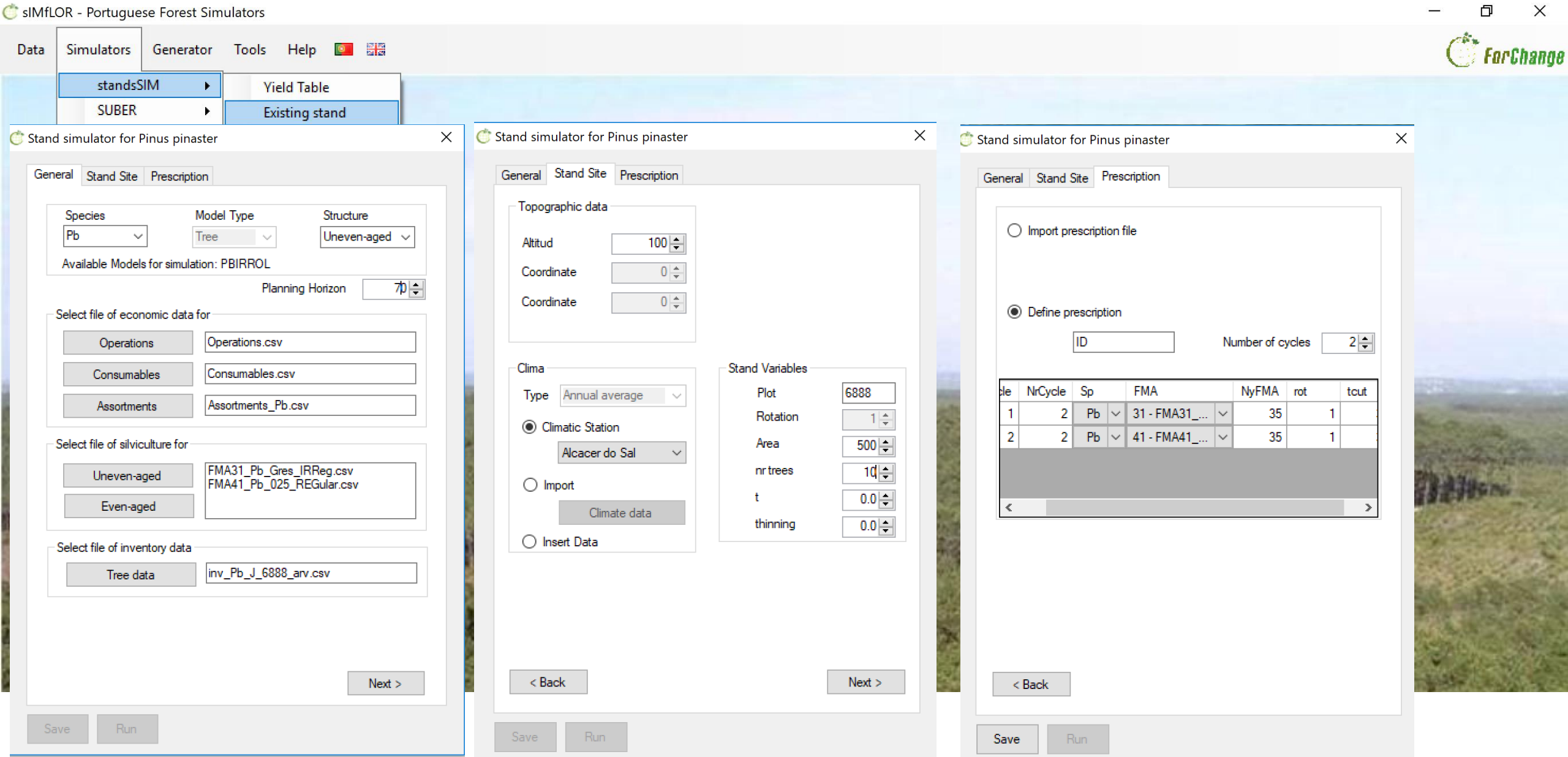
Maritime pine – Exercise 2 solution



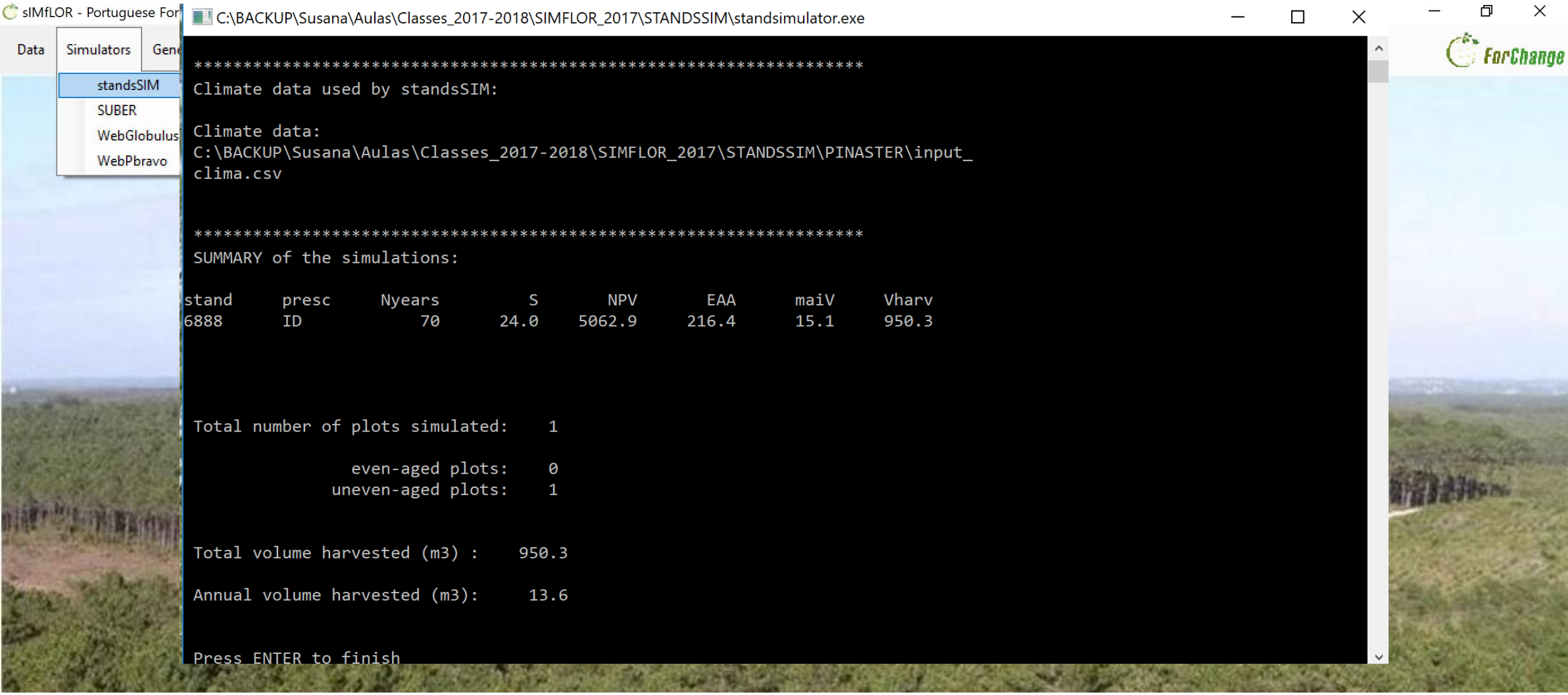
Maritime pine – Exercise 2 solution



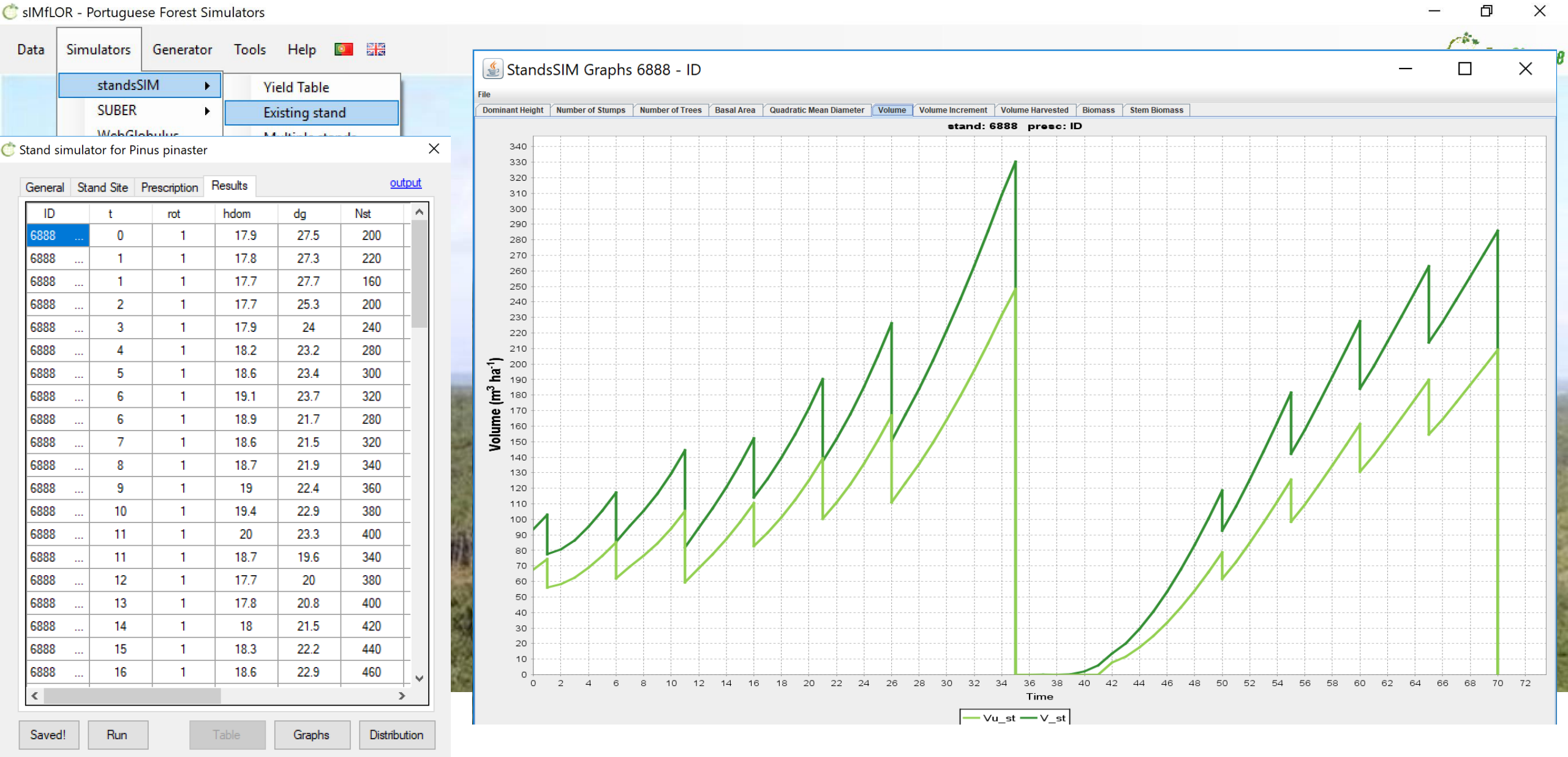
Maritime pine – Exercise 5 solution



Maritime pine – Exercise 5 solution



Maritime pine – Exercise 5 solution



Thank you!

Help us being useful and give us your feedback