

A GUIDE TO USING TREEBLOSSIM
Version 2.0

D. PONT
J. GRACE
B. SHULA

REPORT No. 122 APRIL 2004

Stand Growth Modelling Cooperative

EXECUTIVE SUMMARY

This implementation of the tree growth model is intended to illustrate the use of the individual tree approach, including the link to the branch growth model, and to enable the growth models to be evaluated and compared.

It demonstrates the data required for running these models and shows how the individual trees develop through time. Example data are provided.

Facilities are provided for introducing actual tree lists from inventory data (Marvl V2 format and PSP export), and using these to produce stand and tree-level growth projections, and branch characteristics.

Data can be exported for further analysis or comparisons with actual re-measurements.

A Guide to Using



TreeBLOSSIM

Individual-Tree Growth Model (ITGM) integrated with the Branch Location, Orientation, and Size Simulator (BLOSSIM)

D. Pont, J. Grace, B. Shula

Forest Research / Industry
Stand Growth Modelling Cooperative



Version 2.0
First Printed July 2000
Copyright © 2002 *Forest Research* / Industry Stand Growth Modelling Cooperative
Last Updated July 2002

Disclaimer

While every effort has been made to ensure the accuracy of this document *Forest Research* shall not be responsible for any errors or omissions and reserves the right to make changes without notice.

Trademarks

This manual refers to several brand and product names which are trademarks or registered trademarks of their respective holders.



New Zealand Forest Research Institute Limited
Private Bag 3020
Rotorua
New Zealand

Telephone: +64 7 343 5899
Facsimile: +64 7 348 0952

Contents

Overview	1
Scope	1
Whats New in Version 2.0.....	2
Getting Started	3
Installation	3
Uninstalling Earlier Versions	3
Typical Installation Procedure	3
Users' Guide.....	4
Manual Conventions	4
First time use	4
Main Form.....	4
Site Form.....	4
Tree Form.....	6
Tree Graphics.....	7
Data Export	8
Commands	8
File Commands.....	9
New	9
Open.....	9
Save.....	9
Save As	9
Import.....	9
Export.....	11
Exit.....	11
Edit Commands	12
Site	12
Trees.....	12
Help Commands	13
About.....	13
File Formats	15
Stand files.....	15
MARVL V2 files.....	17
PSP BIX Query	17
PSP BIX Data.....	18
PSP Validation Query	18
PSP Validation Data.....	19
Export Data	19
Stand	19
Trees.....	19
Branches.....	19

Overview

Scope

- This implementation of the tree growth model is intended to illustrate the use of the individual tree approach, including the link to the branch growth model, and to enable the growth models to be evaluated and compared.
- It demonstrates the data required for running these models and shows how the individual trees develop through time. Example data are provided.
- Facilities are provided for introducing actual tree lists from inventory data (Marvl V2 format and PSP export), and using these to produce stand and tree-level growth projections, and branch characteristics.
- Data can be exported for further analysis or comparisons with actual re-measurements.
- The growth and survival functions of the tree growth model are described in the SGM Coop. reports Nos.34, 47, 54, 58, 59 and 60.
- The branch growth functions implemented in this version of TreeBLOSSIM are described in SGM Coop. report No112.
- The branch growth functions use stand stocking, tree DBH, height and stem description from the MARVL and PSP files. The input of MARVL data to the branch growth model is the subject of Coop report No. 94. Comparison of the branch growth model with BIX data is the subject of Coop report No. 105.

Whats New in Version 2.0

- Extensive changes have been made to utilise MARVL stem descriptions as inputs to the branch model functions. The procedure is as follows. When importing a MARVL file, the dictionary and stem descriptions are read. Forks, merchantable branches and diameter reductions are ignored. Past growth is estimated to place all shoots, clusters and branches on the stem. Current diameter for the largest branch in each cluster is estimated using the branch growth function and compared with the diameter constraints implied by the MARVL quality codes. Where estimated branch diameter falls outside the MARVL constraints, cluster growth potential is adjusted to give a current branch diameter which matches the MARVL zone. Past and future branch growth is then based on this adjusted growth potential. Trees coded with pruned codes are pruned using the coded pruned height and the pruning history provided on the Site form.
- Various changes to the Site form.
 - Added data entry field for the stand pruning history, used to apply pruning to trees coded with MARVL pruned codes.
 - Added data entry field for the MARVL dictionary, to allow branch sizes to be specified for MARVL quality codes.
 - Nutrient and Rainfall fields are shown only for the regions to which they apply.
 - Set the default Mortality adjustment to 100 rather than 0, (which disabled mortality).
 - Now have reasonable default values for Rainfall, N and P.
 - Non-functioning Up/Down controls on some numeric fields removed.
- Fixed error accessing MPKTABLES if input file opened from another directory.
- Updated test procedures for changes resulting from support for MARVL stem descriptions.
- Re-worked all forms to support screen resolutions as low as 640x480. This should remedy problems seeing or accessing parts of forms on machines with different screen resolutions.
- Supplied a default directory and filename for all save dialogs. These are built using the values retained from the last open dialog. Output files default to same directory, same name, but different extension as the input files.
- More explicit file naming for branch data export to allow different output types to be distinguished by file name.

PS: Thanks to Jeff Schnell for the feedback that prompted some of the above fixes.

Getting Started

Installation

Uninstalling Earlier Versions

If you have a previous version of the software installed, you should remove it before installing the new version.

1. Select **Start | Settings | Control Panel**.
2. Double click Add/Remove Programs.
3. Select **LinkITGM** or **TreeBLOSSIM** from the list by clicking on it.
4. Click the Add/Remove button below the list.
5. Follow the dialogs to complete the process.

Typical Installation Procedure

1. Shut down running applications.
6. Insert the diskette.
7. Select **Run...** from the **Start** menu.
8. Browse to **A:\SETUP.EXE**
9. Click **OK**.
10. Follow the installation procedure dialogs.
11. If requested, re-start the system for immediate use.

Users' Guide

Manual Conventions

Bold is used to identify commands or to emphasize certain terms, when a new term is used for the first time or when a term has an unusual meaning.

ALL CAPITALS are used for file names and folders.

Menu commands are separated by a vertical bar, as in "**Menu | Choice**". Rather than saying "choose the Save command from the File menu", this manual says "choose **File | Save**"

First time use

Main Form

Start the application by selecting **TreeBLOSSIM** from the **Start** menu. The default installation is: **Start | Programs | Forest Research**. Initially an example input data file, **EXAMPLE.STD**, will be opened.

	Initial Stand	Current Stand
Age (years)	15	15
Stocking (stems/ha)	275	275
Basal Area (sq.m/ha)	31.344	31.344
Mean top height (m)	22.69	22.69
Mean Dbh (cm)	38.095	38.095

Branches
 Grow Branches
Site index (m)
Age

Validation
 Growth validation

The initial state of the stand is shown in the Initial Stand panel. Selecting the **Grow Branches** option enables branch growth for all the trees in the stand. By pressing the **Grow** button the stand is grown from its initial state to the age selected in the Current Stand panel. This age is altered using the spin buttons or by highlighting the field and typing in a new age.

On selecting **Grow Branches**, site index is estimated, and then past branch growth is estimated. Past thinnings and prunings, which can affect branch growth, can be specified on the Site form, described below. These are taken into account when estimating past branch growth.

Site Form

The site form is used for altering the details about the site and stand. Not all fields are necessary for all functions. The Rainfall and Nutrient fields are shown only when a Region for which they are required is chosen. Currently the **Breed** selection is used for some of the branch functions, as are the **Seed, Height/Age, and Taper** values.

Stand stocking can affect branch growth. Use the thinning list in the **Silvicultural history** to specify the details of changes in stand stocking that occurred before the current age. Each entry in the list specifies age and stocking after a change in stocking. The first entry should be the planting stocking at age 0. The list will scroll to allow up to 5 new entries.

The screenshot shows a software window titled "test_marvl". It contains several input fields and a table. The "Growth" section has a "Region" dropdown set to "CNI", a "Breed" dropdown set to "Unimproved", an "Age (years)" text box with "15.00", and a "Mortality Adjust. %" text box with "100". The "Branches" section has a "Random Seed" text box with "1234567", a "Height/Age" text box with "34", a "Model" text box with "237", and a "Taper function" text box with "237". Below these is a "Silvicultural history" table with columns "Thin Age", "Stems/Ha", "Prune Age", and "Lift (m)". The table contains three rows of data. At the bottom is a "Dictionary" table with columns "Code", "MaxBr mm", and "Description".

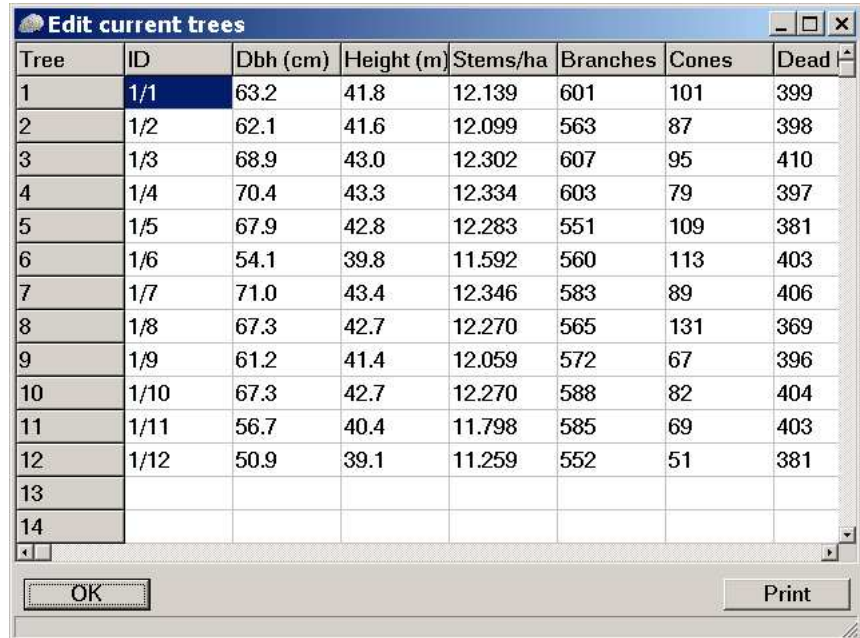
Thin Age	Stems/Ha	Prune Age	Lift (m)
0.00	1200	5.00	3.00
5.00	600	9.00	6.00
9.00	150		

Code	MaxBr mm	Description
A	0	pruned sweep < D/4
B	0	pruned sweep D/4 - D/2
C	0	pruned sweep D/2 - D
D	70	branch < 7 sweep < D/4
E	100	branch 7-10 sweep < D/4
G	150	branch 10-15 sweep < D/4

When importing data from a MARVL file, the Dictionary form should be completed. If the trees have been coded for pruning then the pruning history should also be completed. In the Dictionary form the MaxBr column must be completed with the maximum branch size allowed for each MARVL quality code in the dictionary. For pruned codes you must enter 0, and for codes with no branch size limit, such as waste or pulp, you must enter 999.

Tree Form

This form shows the tree list with all details about each tree in the list. The form will scroll to display parts of long lists. If branch growth is enabled counts of the the following are given for each tree: total number of branches, total number of stem cones, total number of dead branches and total number of branches having bark inclusion above the knot.

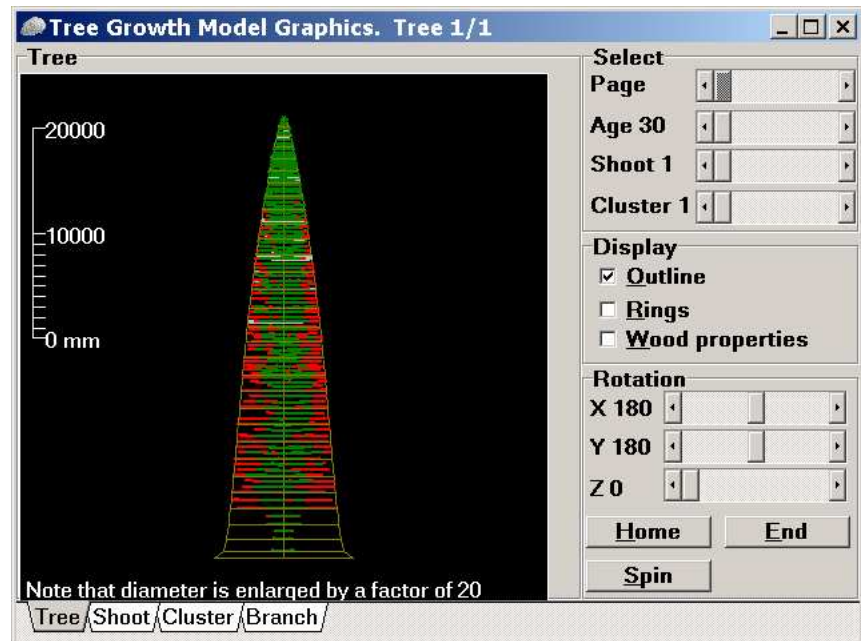


The screenshot shows a window titled "Edit current trees" with a table containing 14 rows of tree data. The columns are labeled: Tree, ID, Dbh (cm), Height (m), Stems/ha, Branches, Cones, and Dead. The first 12 rows contain numerical data, while the last two rows (13 and 14) are empty. The table is scrollable, and there are "OK" and "Print" buttons at the bottom.

Tree	ID	Dbh (cm)	Height (m)	Stems/ha	Branches	Cones	Dead
1	1/1	63.2	41.8	12.139	601	101	399
2	1/2	62.1	41.6	12.099	563	87	398
3	1/3	68.9	43.0	12.302	607	95	410
4	1/4	70.4	43.3	12.334	603	79	397
5	1/5	67.9	42.8	12.283	551	109	381
6	1/6	54.1	39.8	11.592	560	113	403
7	1/7	71.0	43.4	12.346	583	89	406
8	1/8	67.3	42.7	12.270	565	131	369
9	1/9	61.2	41.4	12.059	572	67	396
10	1/10	67.3	42.7	12.270	588	82	404
11	1/11	56.7	40.4	11.798	585	69	403
12	1/12	50.9	39.1	11.259	552	51	381
13							
14							

Tree Graphics

On the Tree Form click in the grid to select a tree, then use the right mouse button to activate a local menu and select the **Tree Graphics** command. This opens a window showing a graphical view of the selected tree. Note that the window can be re-sized to change the size of the graphic image.



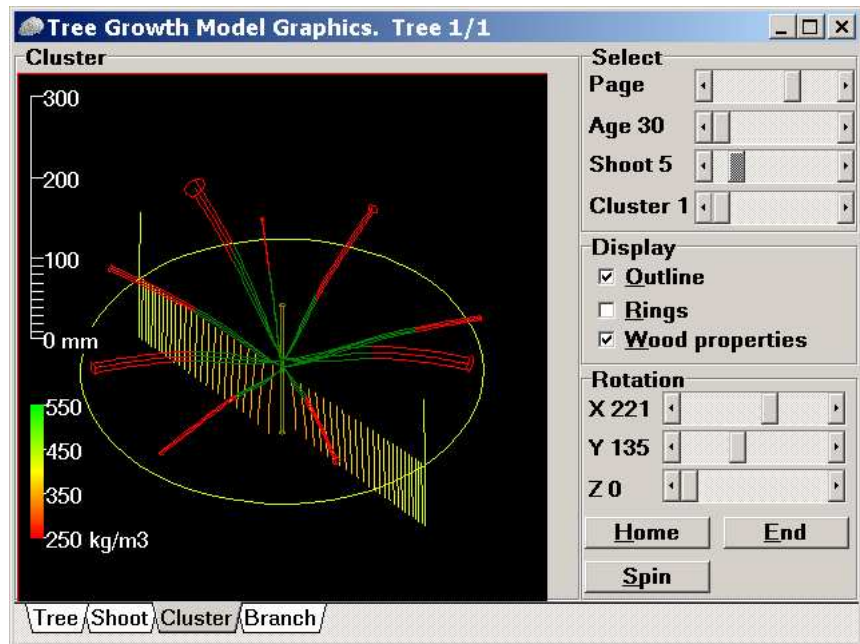
The tabs at the bottom of the window (Tree, Shoot, Cluster, Branch), or the **Page** control can be used to select different views of the tree. The **Shoot** and **Cluster** controls can be used to select the annual shoot and cluster (within an annual shoot) for the **Shoot**, **Cluster** and **Branch** views. In the **Branch** view the largest branch in the selected cluster is shown.

The live portion of each branch is drawn in green, and the dead (bark encased) portion in red. Stem cone holes are drawn in white.

The **Outline** control enables the drawing of an outline of the stem profile. The **Rings** option enables the drawing of individual growth rings within the stem. The **Wood properties** option enables the display of the two wood properties models incorporated in the software. Basic density is displayed as a colour range on the lines representing the annual growth rings.

In the Cluster view spiral grain angle is displayed by extending the annual growth rings below the cluster, and angling those lines according to the grain angle predicted by the model. These two wood properties models are documented in the New Zealand Journal of Forestry Science Volume 25, No. 2, 1995.

Modelling of *Pinus radiata* wood properties. Part 1: Spiral Grain. Xin Tian, D. J. Cown, M. J. F. Lausberg. Modelling of *Pinus radiata* wood properties. Part 2: Basic Density. Xin Tian, D. J. Cown, D. L. McConchie.



Clicking the left mouse button in the graphics window and dragging allows three-dimensional rotation of the image, as do the the **X**, **Y** and **Z** controls in the **Rotation** panel. The **Home** button returns the view to the original orientation and the **End** button orients the view as seen from above. Pressing the **Spin** button rotates the image continuously about the Y axis, and pressing the button again stops the rotation.

Data Export

Predicted growth data can be transferred to other applications for comparisons or further analysis. The simplest way to do this is to use the **File | Export** command to copy the predicted data to a file. The file is written with tab-separated values which is readable by applications such as spreadsheets. The **File | Export** options are **Stand**, **Trees and Branches**, which export stand, tree and branch level time-series information respectively.

Alternatively, the main, Site and Tree forms support a **Copy** command. Use the right mouse button to activate a local menu and select the **Copy** command. This will place the data on the clipboard. Switch tasks (**Alt-Tab**) to the target application and **Edit | Paste (Ctrl-V)** the data at the required location.

Commands

File Commands

New

Use this command to create a new stand (site details and tree list). You will be prompted to save the current stand. If you have altered any information about the current stand and want to save this then press **Yes**.

A file name dialog will then prompt for a *new* file name. The conventional file type (extension) is **STD** (as an abbreviation for stand).

Having entered a new file name the details of the site can be entered in the site form (see Site Form) and the tree list information can be entered in the tree form. The following details are required for each tree: ID, DBH, Height, Stems/Ha. Where tree height has not been measured you will have to calculate estimates. (The data **Import** command will automatically estimate missing height values). Branch data is not required.

Once these forms are completed the current stand parameters (Age, stocking, basal area, mean top height and mean Dbh) will be displayed on the main form.

Open

Use the file dialog to select an existing stand file to **open**. You will first be prompted to save the current stand. If you have altered any information about the current stand and want to save this then press **Yes**.

Once the file has been selected the current stand parameters (Age, stocking, basal area, mean top height and mean Dbh) will be displayed on the main form.

Save

The **save** command saves the current stand (in its initial state) to file.

Save As

The **Save As** command is used to copy the initial state of the open stand to a new file.

Import

The **Import** command is used to import tree lists from MARVL V2, or PSP data files, with the **MARVL V2**, **PSP BIX Data** and **PSP Validation Data** options respectively.

Before import you will first be prompted to save the current stand. If you have altered any information about the current stand and want to save this then press **Yes**.

When the data have been extracted from the file, specify a new file in the file dialog to contain the imported stand with its tree list. At this point the site form will be displayed for entry of the site information that is not available in the import file. Note that past thinnings should be specified to allow better estimation of past branch growth.

Once the site form is completed the current stand parameters (Age, stocking, basal area, mean top height and mean Dbh) will be displayed on the main form. From this point on you can work with the new (STD) file and any alterations will be saved in this file.

MARVL Version 2

The file should be in the correct format (ie. able to be processed by MARVL) and the MARVL dictionary referred to by the inventory file must be present and correct. You will first be prompted to save the current stand. If you have altered any information about the current stand and want to save this then press **Yes**. Use the file dialog to select a MARVL V2 format file. If the file is in the wrong format a message will be displayed and the import will stop.

The resulting tree list is composed of the trees in all the plots found in the first (or only) stratum. The stratum age is retrieved and used in the stand details. When the data have been extracted from the MARVL file, specify a new file in the file dialog to contain the imported stand with its tree list. At this point the site form will be displayed for entry of the site information that is not known by MARVL. The stand thinning and pruning history should be entered, and the branch size limit for each quality code from the MARVL dictionary must be supplied.

Tree identity is composed of plot number and tree number. DBH is read directly from the MARVL data. Tree height is also taken from the data if it is present. If not, an estimate of tree height is made from a DBH / height relationship fitted to the DBH / height data for the stratum. Tree weight is calculated from the plot type, plot area / BAF / line length, tree DBH where appropriate and the number of plots in the stratum. The MARVL stem description is used to configure the branch model.

PSP BIX Data

The file should be in the format output from the PSP program, from the query given in the **File Formats, PSP BIX Query** section. The file should contain all the trees for a single PSP plot, at a single age. Use the file dialog to select a PSP BIX format file. If the file is in the wrong format, a message is displayed and the import will stop.

The resulting tree list is composed of the trees in the file. Region, taper function, height age function and altitude are retrieved from the first tree record and used in the stand details.

When the data have been extracted from the PSP BIX file, specify a new file in the file dialog to contain the imported stand with its tree list.

DBH is read directly from the PSP BIX data. Tree height is also taken from the data if it is present. If not, an estimate of tree height is made from a DBH / height relationship fitted to the DBH / height data for the file. Tree weight is calculated from the PSP plot basal area factor.

PSP Validation Data

The file should be in the format output from the PSP program, from the query given in the **File Formats, PSP Validation Query** section. The file can contain trees for one or more PSP plots, at one or more measurement ages. Use the file dialog to select a PSP Validation format file. If the file is in the wrong format a message will be displayed and the import will stop.

The tree list is not made available to the user. Instead the tree list for each plot is grown forward to each measurement age given in the input file. Simply press the Grow button to start the process. A new tree list is created for each new plot in the input file, and the process is repeated until all records in the input file are processed. Output is automatically saved in a text file named ITGMPSPValidation.txt, in the current directory. This file is comma-separated and contains output of measured and estimated stand and tree level values at each plot measurement age. These data can be used for validating the individual tree growth functions with PSP measurement data.

Export

The **Export** command is used to write stand, tree or branch data to file in comma-separated format. This format can be opened by most spreadsheets. The export options are: **Stand**, **Trees** and **Branches**.

The **Stand** and **Trees** options allow output of the main stand or tree variables for each age the stand has been grown to.

With the **Branches** option you can export branch data for each tree. A dialog allows you to obtain branch data at each age of growth, but note that this option increases the size of the file significantly. Note that branch data is for the year-end at each age, which can differ to the part-year growth supported for tree and stand growth data.

If the option to export annual branch growth data is not selected then only current stem and branch data are output. The first row in the file contains column headings. Each row in the file has a record type identifier in the first column. The identifiers are **Tr**, **Sh**, **Cl**, and **Br**, for Tree, Shoot, Cluster and Branch records. Each type of record contains different data, in the appropriate columns.

Examples of export files are given in the **File Formats** section of this document.

Exit

Use the **Exit** command to leave the program. You will first be prompted to save the current stand. If you have altered any information about the current stand and want to save this then press **Yes**.

Edit Commands

Site

The site / stand information can be altered on this form. The fields are:

Field	Details
Region	Select the growth modelling region from this list. NB. Westland currently uses the Nelson components of the tree growth model. A number of the functions in the branch model use general coefficients until more site-specific functions can be estimated.
^a Breed	Select breed specific branch model coefficients.
Age	Enter the stand age in years
Mortality Adjustment	Can be set to any value between zero (no mortality) and 200%. Full mortality predicted by the model is obtained at 100%. Note that the default value is 0, which effectively disables the mortality functions.
^a Nitrogen score	These scores are defined by Hunter <i>et al</i> in the Atlas of Radiata Pine Nutrition. The scores are 1 - deficient, 2 - marginal (high probability of deficiency), 3 - marginal (medium probability of deficiency), 4 - marginal (low probability of deficiency), 5 - satisfactory (high probability of deficiency), 6 - satisfactory (medium probability of deficiency), 7 - satisfactory (low probability of deficiency).
^a Phosphorus score	Definitions as for Nitrogen
^a Rainfall	Average rainfall is required by month
^a Seed	Initialisation value for pseudo-random number generator, used for stochastic branch functions.
^a Height/Age	Height age function number, used for estimating past height growth for branching
^a Taper	Taper function number for stem profile.
^a Past thinning	Age and stocking after each change in stocking. The first entry should be the planting stocking at age 1.
^a ^s Pruning	Age and pruned height in metres after each pruning.
^a ^s Dictionary	MaxBr is the maximum branch size in mm allowed for branches in a zone coded with the quality code. You must enter 0 for pruned codes, and 999 for codes which have no upper limit on branch size, such as waste or pulp.

* These fields are used for branch growth only. Note that the branch growth functions use common coefficients across some breeds and regions.

^a These fields are shown only when the region to which they apply is selected.

^s These fields are required only when data has been imported from a MARVL file.

Trees

The tree list can be altered on this form. Trees are shown on a scrolling grid, one tree per row, and tree data arranged in columns.

Column	Details
ID	Tree identifier.
DBH	Tree breast height diameter in centimetres.
Height	Tree height in metres.
Stems/ha	Number of stems per hectare represented by this tree.
^a Branches	Total number of branches on this tree. Includes alive and dead branches and excludes cones.
^a Cones	Total number of stem cones on this tree.
^a Dead branches	Total number of dead branches on this tree.
^a Bark inclusion	Total number of branches on this tree predicted to have bark trapped between the stem and the branch.

*These columns are used only if branch growth is enabled.

Help Commands

About

Displays the application title and version number.



File Formats

Stand files

The stand data (site details and tree list) are held in INI file format. These files are simple text files and can be edited if necessary.

There are up to five sections [Site], [Trees], [Thinning], [Pruning] and [Dictionary].

Each variable within a section is specified in the format:
KeyWord=Value

Within the tree list the value is a composite field comprising tree identity, Dbh, height, weighting and optionally the tree description if MARVL data was imported.

Past thinnings can be specified with consecutive numbers, starting from 1, with the prefix "Thin". The two values given for each thinning are: the age of thinning in years and the residual stocking. The first entry should be the planting stocking at age 0. Thinnings after the starting age, or with stocking higher than the current value, are ignored. Thinning is performed simply with a proportional adjustment to tree weight.

An Example of a stand file:

```
[Site]
ID=test_marvl
Region=CNI
Age=15
Breed=Unimproved
Seed=1234567
Taper_Function=237
HeightAgeSite_Function=34
Rain_Jan=68
Rain_Feb=68
Rain_Mar=68
Rain_Apr=68
Rain_May=68
Rain_Jun=68
Rain_Jul=68
Rain_Aug=68
Rain_Sep=68
Rain_Oct=68
Rain_Nov=68
Rain_Dec=68
Mortality_adj=100
N_score=2
P_score=6
[Trees]
[trees]
t1=1/1,37.4,21.963,12.5,B 4 G 9 I 9.1 G
t2=1/2,36.7,21.84,12.5,P 1.5 B 5.3 G 12.2 I 14.9 G
t3=1/3,41.4,22.601,12.5,C 2.4 B 5 I 13.8 G
t4=1/4,42.6,22.774,12.5,B 5 G 8.2 I 9.3 W 9.6 *
t5=1/5,40.8,22.512,12.5,B 5.3 I
t6=1/6,31.4,20.777,12.5,C 4.5 G
t7=1/7,43.2,22.857,12.5,P .4 B 5.9 I 6.1 G
t8=1/8,40.5,22.466,12.5,B 3 C 5.6 G 7.3 I 10.7 G
t9=1/9,36.2,21.75,12.5,B 5.1 G 7.5 I 11.9 G
t10=1/10,40.5,22.466,12.5,B 4.6 D 6 I 11.7 P 11.8 J 15 I
t11=1/11,33.1,21.146,12.5,C 4.1 G
t12=1/12,29.3,20.279,12.5,B 3 D 4.9 G 8 H 10 G
[Thinning]
Thin1=0,1200
```

```

Thin2=5,600
Thin3=9,150
[Pruning]
Prune1=5,3
Prune2=9,6
[Dictionary]
Quality1=A,0,A,pruned           sweep < D/4
Quality2=B,0,B,pruned           sweep D/4 - D/2
Quality3=C,0,C,pruned           sweep D/2 - D
Quality4=D,70,E,branch < 7     sweep < D/4
Quality5=E,100,G,branch 7-10    sweep < D/4
Quality6=G,150,P,branch 10-15   sweep < D/4
Quality7=H,70,I,branch < 7     sweep D/4 - D/2
Quality8=I,100,J,branch 7-10    sweep D/4 - D/2
Quality9=J,150,P,branch 10-15   sweep D/4 - D/2
Quality10=K,70,L,branch < 7    sweep D/2 - D
Quality11=L,100,M,branch 7-10   sweep D/2 - D
Quality12=M,150,P,branch 10-15  sweep D/2 - D
Quality13=P,999,P,pulp   branch > 15 or sweep > D
Quality14=W,999,W,waste (malformation)

```

MARVL V2 files

This is a text file format used by the Marvl V2 inventory system. An example of a file:

```
BB "TEST.DIC" "test_marvl"

\1 11.5 15 V237 T237 B02
374 21.6 [ 1/ 1 ]
414 19.8 [ 1/ 3 ]
314 20.0 [ 1/ 6 ]
293 22.8 [ 1/ 12 ]
397 22.1 [ 2/ 3 ]
530 22.5 [ 2/ 6 ]
613 23.1 [ 2/ 8 ]
456 22.0 [ 2/ 11 ]
482 23.4 [ 3/ 1 ]
480 24.5 [ 3/ 8 ]
443 20.2 [ 4/ 7 ]
351 20.3 [ 4/ 8 ]
557 22.7 [ 4/ 13 ]
542 25.7 [ 4/ 14 ]
507 25.9 [ 5/ 4 ]
443 23.6 [ 5/ 8 ]
503 24.5 [ 6/ 5 ]
496 26.9 [ 6/ 7 ]
517 25.0 [ 6/ 11 ]
463 24.2 [ 6/ 13 ]
463 25.3 [ 6/ 15 ]

#1 0.08 5
1 374 B4G9I9.1G21.6
2 367 P1.5B5.3G12.2I14.9G
3 414 C2.4B5I13.8G19.8
4 426 B5G8.2I9.3W9.6*
5 408 B5.3I
6 314 C4.5G20
7 432 P.4B5.9I6.1G
8 405 B3C5.6G7.3I10.7G
9 362 B5.1G7.5I11.9G
10 405 B4.6D6I11.7P11.8J15I
11 331 C4.1G
12 293 B3D4.9G8H10G22.8
```

PSP BIX Query

The PSP query used to create a text file suitable for import using the **File | Import | PSP BIX Data** is:

```
select P.PLOT_ID, F.REGION, TREE_VOL_TAB"VOL_TAB",
TAPER_TABLE"TAP_TAB", HT_AGE_TABLE"HT_TAB",
HT_ADJ_AGE"AGE", MEAS_DATE, ALTITUDE,
PLOT_SIZE"AREA", TD.TREE_KEY, QUAD_ROW,
TREENO, FORK, DBH, TOTAL_HT, M.STATUS
from PLOT_SUMMARY P, FOREST F,
MEAS_DESC MD, TREE_MEAS M, TREE_DESC TD
where P.PLOT_KEY=M.PLOT_KEY
AND P.PLOT_KEY=MD.PLOT_KEY
AND P.PLOT_KEY=TD.PLOT_KEY
AND F.CODE=P.FOREST
AND M.TREE_KEY=TD.TREE_KEY
AND M.MEAS_KEY=MD.MEAS_KEY
AND P.MEAS_KEY=MD.MEAS_KEY
AND PLOT_ID in (
"RO 2098/ 0 7/11",
"RO 2098/ 0 9/25")
order by PLOT_ID,HT_ADJ_AGE
```

PSP BIX Data

An example of the PSP BIX text import file format is given below. Note that the records have been wrapped to fit on the page in the printed copy of this manual.

PLOT_ID	REGION	VOL_TAB	TAP_TAB	HT_TAB	AGE	MEAS_DATE	ALTITUDE						
AREA	TREE_KEY	QUAD_ROW	TREENO	FORK	DBH	TOTAL_HT							
STATUS													
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	3	1	3
		32.8	A										
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	6	1	6
		29.8	18.4	A									
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	20	4	2
		31.6	A										
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	23	4	5
		35.2	16.4	A									
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	30	5	6
		23.9	16.5	A									
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	33	6	3
		29.5	15.8	A									
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	37	7	1
		30.3	16.7	A									
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	48	8	5
		35.4	A										
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	57	10	1
		31	18.2	A									
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	61	10	5
		28.6	A										
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	65	11	3
		31	17.5	A									
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	74	13	1
		25.8	17.9	A									
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	77	13	4
		31.6	18.7	A									
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	87	15	2
		34.5	A										
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	97	16	5
		28.7	17.7	A									
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	106		18
		2	35.6	18.9	A								
RO 2098/	0	7/11	BP	10	237	34	11	1/6/1986	560	0.2	116		19
		6	28.5	18.7	A								

PSP Validation Query

The PSP query used to create a text file suitable for import using the **File | Import | PSP Validation Data** is:

```
select ps.PLOT_ID, HT_ADJ_AGE, md.PLOT_SIZE, SITE_INDEX, ALTITUDE,
TREENO, QUAD_ROW, FORK, tm.STATUS,
DBH, TOTAL_HT, HD_COEF_B1, HD_COEF_B2,
BA_LIVE, SPH_LIVE, VOL_LIVE, QMEAN_DBH, MTD, MEAN_HT, MTH,
ps.PLANT_DATE, md.MEAS_DATE, ps.AGE_ADJ_TAB, ps.HT_AGE_TABLE
from PLOT_SUMMARY ps, TREE_DESC td, TREE_MEAS tm, MEAS_DESC md
where HT_ADJ_AGE >= 15
and td.SURROUND="N"
and PLOT_STATUS="C"
and ps.PLOT_KEY = tm.PLOT_KEY
and td.PLOT_KEY = ps.PLOT_KEY
and tm.MEAS_KEY = ps.MEAS_KEY
and td.TREE_KEY = tm.TREE_KEY
and md.PLOT_KEY=td.PLOT_KEY
and md.MEAS_KEY=tm.MEAS_KEY
and tm.STATUS = "A"
and HD_COEF_B1 != null
and HD_COEF_B2 != null
and ps.PLOT_ID in (
"RO 2098/ 0 7/11",
"RO 2098/ 0 9/25")
order by PLOT_ID,HT_ADJ_AGE
```

PSP Validation Data

An example of the PSP Validation text import file format is given below. Note that this example contains a single record only, which has been wrapped to fit on the page in the printed copy of this manual.

RO	416/ 0	0/ 0	17	0.2023	33.6	335 154 0	A	36.8		
	0.2442	0.6013	41.2	450	435.1	34.1	42.6	30.4	30.9	
	1/6/1955	1/6/1972	1	34						

Export Data

Stand

An example of the stand data export file format is given below. Column headers are contained in the first row and columns are tab separated.

Age	SPH	BA	MTH	MTD	QMD
15.0000	275.0000	31.3441	22.6899	42.0107	38.0949
16.0000	273.8617	34.0439	24.5467	43.8665	39.7840
17.0000	272.6581	36.6464	26.3264	45.6083	41.3677
18.0000	271.3925	39.1373	28.0237	47.2318	42.8501
19.0000	270.0742	41.5368	29.6371	48.7685	44.2517
20.0000	268.7054	43.8427	31.1673	50.2302	45.5791

Trees

An example of the tree data export file format is given below. Column headers are contained in the first row and columns are tab separated. The example has data for two ages.

Age	Tree	DBH	Height	Weight
15.0000	1/1	37.4000	21.9630	12.5000
15.0000	1/2	36.7000	21.8400	12.5000
15.0000	1/3	41.4000	22.6010	12.5000
15.0000	1/4	42.6000	22.7740	12.5000
15.0000	1/5	40.8000	22.5120	12.5000
15.0000	1/6	31.4000	20.7770	12.5000
15.0000	1/7	43.2000	22.8570	12.5000
15.0000	1/8	40.5000	22.4660	12.5000
15.0000	1/9	36.2000	21.7500	12.5000
15.0000	1/10	40.5000	22.4660	12.5000
15.0000	1/11	33.1000	21.1460	12.5000
15.0000	1/12	29.3000	20.2790	12.5000
15.0000	2/3	41.4000	22.6010	12.5000
15.0000	2/4	42.6000	22.7740	12.5000
15.0000	2/5	40.8000	22.5120	12.5000
15.0000	2/6	31.4000	20.7770	12.5000
15.0000	2/7	43.2000	22.8570	12.5000
15.0000	2/8	40.5000	22.4660	12.5000
15.0000	2/9	36.2000	21.7500	12.5000
15.0000	2/10	40.5000	22.4660	12.5000
15.0000	2/11	33.1000	21.1460	12.5000
15.0000	2/12	29.3000	20.2790	12.5000
16.0000	1/1	39.0625	23.7203	12.4587
16.0000	1/2	38.3393	23.5819	12.4537
16.0000	1/3	43.2291	24.4511	12.4787
16.0000	1/4	44.4914	24.6499	12.4826
16.0000	1/5	42.6112	24.3463	12.4765
16.0000	1/6	32.7440	22.4018	12.3900
16.0000	1/7	45.0985	24.7487	12.4843
16.0000	1/8	42.2909	24.2897	12.4753
16.0000	1/9	37.7745	23.4801	12.4497
16.0000	1/10	42.2909	24.2897	12.4753
16.0000	1/11	34.5502	22.8103	12.4165
16.0000	1/12	30.5240	21.8538	12.3459

Branches

An example of the branch data export file format is given below. Column headers are contained in the first row and columns are tab separated. Note that the

records have been wrapped to fit on the page in the printed copy of this manual.
Data for the first 3 annual shoots at the current age are shown.

Code	Tree Weight YVal	Tree Base LiveYears	Shoot Top	Cluster BaseDiam BarkInclusion	Branch TopDiam	RingFromPith Density	DBH BDiam	Height Azimuth
Tr	1/1		30	54.757		41.155	11.710	
Sh	1/1 1		30			0.000	0.344	57.673
	53.071							
Cl	1/1 1	1	30			0.326	53.249	
Br	1/1 1	1 1	30			0.344		43.9
	220.5	11.952	9	2				
Br	1/1 1	1 2	30			0.341		34.8
	358.0	10.270	11	1				
Br	1/1 1	1 3	30			0.338		28.5
	135.5	9.001	9	0				
Br	1/1 1	1 4	30			0.335		23.6
	273.0	7.940	7	0				
Br	1/1 1	1 5	30			0.332		19.7
	50.5	7.033	6	0				
Br	1/1 1	1 6	30			0.329		16.5
	188.0	6.248	11	0				
Br	1/1 1	1 7	30			0.326		14.0
	325.5	5.563	10	0				
Sh	1/1 2		29			0.344	1.119	53.071
	48.833							
Cl	1/1 2	1	29			1.104	48.876	
Br	1/1 2	1 1	29			1.119		26.1
	269.1	8.463	11	0				
Br	1/1 2	1 2	29			1.116		20.8
	46.6	7.273	8	0				
Br	1/1 2	1 3	29			1.113		17.1
	184.1	6.374	10	0				
Br	1/1 2	1 4	29			1.110		14.2
	321.6	5.623	7	0				
Br	1/1 2	1 5	29			1.107		11.9
	99.1	4.981	7	0				
Br	1/1 2	1 6	29			1.104		10.0
	236.6	4.425	6	1				
Sh	1/1 3		28			1.119	2.187	48.833
	46.919							
Cl	1/1 3	1	28			2.154	46.961	
Br	1/1 3	1 1	28			2.187		26.5
	24.8	8.527	7	0				
Br	1/1 3	1 2	28			2.184		21.1
	162.3	7.327	11	0				
Br	1/1 3	1 3	28			2.181		17.4
	299.8	6.422	9	0				
Br	1/1 3	1 4	28			2.178		14.4
	77.3	5.665	5	0				
Br	1/1 3	1 5	28			2.175		12.1
	214.8	5.018	10	0				
Br	1/1 3	1 6	28			2.172		10.2
	352.3	4.458	6	0				
Br	1/1 3	1 7	28			2.169		8.6
	129.8	3.969	15	0				
Br	1/1 3	1 8	28			2.166		7.3
	267.3	3.541	10	0				
Co	1/1 3	1 1	28			2.163		10.0
	44.8	0.000	3	0				
Co	1/1 3	1 2	28			2.160		10.0
	182.3	0.000	3	0				
Co	1/1 3	1 3	28			2.157		10.0
	319.8	0.000	3	0				
Co	1/1 3	1 4	28			2.154		10.0
	97.3	0.000	3	0				