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MANAGEMENT OF EUCALYPTS COOPERATIVE

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*"Nitens": A program to predict *Eucalyptus nitens*
growth in New Zealand and Tasmania.*

C.M. MacLean and A. van Zyl

NZFRI

Report No. 30

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1.0 Introduction

Nitens implements the *Eucalyptus nitens* growth model developed by Mr. Steve Candy of Forestry Tasmania. Full documentation of this model, including caveats can be found in:

Candy, S.G. (1997) Growth and yield models for *Eucalyptus nitens* plantations in Tasmania and New Zealand. Tasforests 9 (in press)

The functions in the Candy growth model have been incorporated in a fully executable application that includes a screen display of results in both tabular and graphical form. A batch processing option to facilitate multiple runs is also available.

2.0 Copyright Statement

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IMPORTANT NOTICE

“*Nitens*”, based on a model supplied by Forestry Tasmania, is a research prototype and is provided by FRI to members of the FRI/Industry Eucalypt Management Cooperative for their own use under a user licence, without payment of a licence fee, on the understanding that FRI shall not be liable on any ground for user support, loss, damage or liability incurred as a direct or indirect result of its use. Members are not permitted to provide copies of this program to other persons or organisations without the express permission of FRI.

3.0 Installation

To install *Nitens* in the default location, insert the disk provided into drive A, and type

A:\Install

This will create the following directory on your hard disk if it does not already exist:

For Windows 95 users

c:\program files\nitens

For Win 3.1 users
c:\nitens

and will copy the application to the nitens directory. To install *Nitens* to a directory other than the default, you can supply your own path name to an existing directory.

On some systems the following error may occur:

“the file c:\win 95\system\CTL3D.DLL is in use and cannot be installed. Please exit all other applications and retry. Press ignore to not install the file and abort to cancel the installation.”

Choose the “IGNORE” option and continue.

The setup program will then create icons in either the program manager (Win 3.1) or the Start Menu (Win 95). You will also be given the option to include *Nitens* on your quick start menu (Win 95).

Included in the directory is the program **UNWISE**. This will uninstall *Nitens* from your hard drive.

You do not need to restart your computer following installation of Nitens.

4.0 General

Nitens will run successfully under Windows 3.1 and Windows 95.
The window can be re sized to accommodate a range of screen sizes.

5.0 Running Nitens

On starting the *Nitens* application a flash screen will appear containing the copyright notice displayed above. This screen will remain active for approximately 5 seconds before moving to the main form (Fig. 1).

Figure 1: Main form for *Nitens* growth model.

The screenshot displays the NITENS software window. At the top is a menu bar with "File". Below it are icons for file operations and tabs for BA, SPH, MTH, MAI, ESV, and DBH. The main area contains input fields for PlotID (5), AGE (13.2), MTH (15.53), and SPH (200). To the right are "Grow to" (10) and "Year step" (1) controls. A checkbox labeled "Thin stand" is present. On the far right is a tree icon. Two tabs at the bottom are "Tabulated results" (selected) and "Results graphs". Below the tabs is a large grid with columns: Age, Site Ind, BA, MTH, ESV, SPH, MAI, and DBH. The first row of the grid has its "Age" column highlighted.

5.1 User Input

5.11 Starting Values

Enter starting values for the model in the boxes on the top left hand side of the screen (Fig.2). PlotID contains plot descriptive information and is limited to 255 characters, therefore a great deal of information can be stored here if necessary.

Figure 2: User input

Figure 1 shows the 'New Plot' window. The window contains the following elements:

- Title Bar:** New Plot
- Menu Bar:** File, Edit, Help, About
- Toolbar:** Icons for file operations (New, Open, Save, Print, etc.) and a 'calculate' button.
- Main Input Area:**
 - PlotID:** A text box containing '1'.
 - AGE:** A text box containing '5'.
 - MTH:** A text box containing '13.2'.
 - BA:** A text box containing '15.53'.
 - SPH:** A text box containing '200'.
 - Thin Stand:** A checkbox that is currently unchecked.
- Projection Settings:**
 - Grow to:** A text box containing '10'.
 - Year step:** A text box containing '1'.
- Buttons:** A 'calculate' button at the bottom right.
- Icon:** A tree icon in the bottom right corner.

Arrows indicate the following labels:

- starting values:** Points to the 'PlotID', 'AGE', 'MTH', 'BA', and 'SPH' fields.
- projection age:** Points to the 'Grow to' field.
- increment:** Points to the 'Year step' field.

5.12 Projection Age

Age the user wants the model to predict results to.

5.13 Increment

This enables the user to specify the time increment for which model output will be displayed ie an increment of 2 will display results from every second year from initiation.

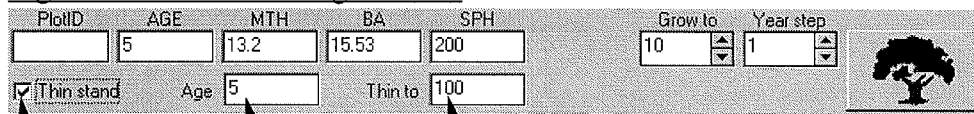
5.14 Calculate

Displayed with the growing tree. “Click” to calculate results of model from starting values.

5.2 Thinning?

A reduction in stocking due to thinning can be incorporated into the model, however only one thinning operation per run is currently possible. To enable this feature, the thinning “check box” must be depressed (fig.3).

Figure 3: Enable thinning function



The screenshot shows a software interface with several input fields and a checkbox. The fields are labeled: PlotID, AGE, MTH, BA, SPH, Grow to, and Year step. The values entered are: PlotID (empty), AGE (5), MTH (13.2), BA (15.53), SPH (200), Grow to (10), and Year step (1). Below these fields, there is a checkbox labeled 'Thin stand' which is checked. To the right of the checkbox, there are two more fields: 'Age' (with value 5) and 'Thin to' (with value 100). A tree icon is visible on the right side of the interface. Arrows point from the labels 'thinning check box', 'thinning age', and 'residual stocking' to the 'Thin stand' checkbox, the 'Age' field, and the 'Thin to' field respectively.

PlotID	AGE	MTH	BA	SPH	Grow to	Year step
	5	13.2	15.53	200	10	1

☒ Thin stand Age: 5 Thin to: 100

thinning check box thinning age residual stocking

The user will then be prompted for information on the age the plot will be thinned, and the number of stems remaining after the thinning operation. Results, including basal area and volume removed will be visible at the base of the main window.

The thinning option can also be accessed when batching files (see Batch processing option, below).

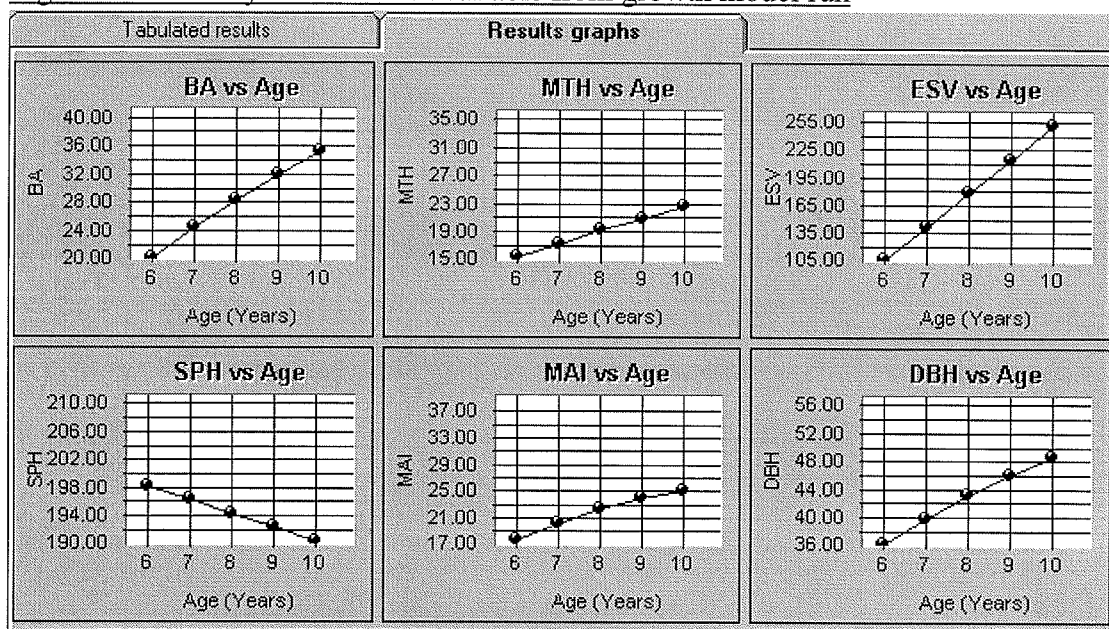
5.3 Tabulated Results

Displays tabular results from the growth model run. Output can be saved to a *.dat (comma delimited file) that can be read into other applications for further manipulation. “Print” will only print the charts visible in the *Results Graphs* window.

5.4 Results Graphs

Displays basal area vs age, MTH vs age, estimated stem volume (ESV) vs age, mean annual increment vs age, and diameter at breast height vs age (fig.4). To view a number of charts at the same time, hold the shift key while selecting the chart to view. To view only one chart, select the chart required from the *quick chart buttons* in the main form.

Figure 4: Summary of all charts available from growth model run



To print charts, use the print button  found in the main window. This will only print charts that are visible in the *Results Graphs* window.

5.5 Batching Processing

To batch run a number of files within *Nitens*, starting value data needs to be stored as a *comma delimited text file* (can be created using Notepad, MS Excel or other spreadsheet applications) that does not contain a header row ie:


Using Notepad:

[plot identifier],[starting age],[mth],[ba],[sph],[end age],[increment]
etc.

Using this application data will be saved as a *.txt file (which can be read by *Nitens*).

Using a spreadsheet package such as MS Excel:

Enter data into separate columns. Ensure that when you save you specify saving as a comma delimited file type (ie *.csv in excel).

The batching option is accessed through either file\batch processing [CTRL B] on the file menu, or using the batching button  on the main form.

The user is asked to provide the input file, and specify a name for the output file (also stored as comma delimited). The default file type that is requested is *.NBF (*Nitens* batch file), however any format description (ie *.dat, *.txt) will be accepted.

After the application finishes processing each line of the batch file, a confirmation request will appear requiring a positive response for the run to write to the output file.

To include thinning in batch runs, include thinning age and number of stems remaining after thinning to the end of each line in the input file.
ie...


in Notepad

....,[thin age],[number of stems remaining]

in MS Excel

place thinning age and number of stems in columns at the end of the data

5.6 Saving

Data is stored in a comma delimited *.dat file, and includes starting values and tabulated results. Charts are not saved. Saving can be undertaken either through file\save results on the file menu, CTRL S, or the  button on the main form.

6.0 Acknowledgements

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