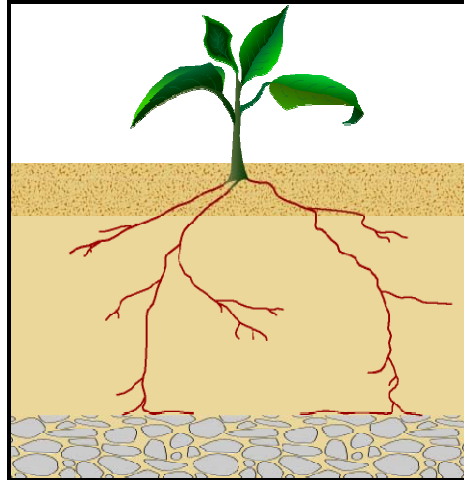# PlantGro™

**Matching plants to
soils and climates**

Version 4.0 for Windows

*P.O. Box 47
Coffs Harbour 2450
Australia*

*P.O. Box 638
Hamilton 2001
New Zealand*

PlantGro™ Version 4.0 for Windows

Based on Versions 1.0, 2.0, 2.1 as developed by Clive Hackett and Geoff Harris.

Windows versions 3.0 and 4.0 developed by Dr. Wei Ye, International Global Change Institute, Hamilton New Zealand and Gary Hutchinson, Topoclimate Services, Coffs Harbour, Australia

Address for correspondence:

Gary Hutchinson
Topoclimate Services Pty Ltd
P.O. Box 47
Coffs Harbour 2450
Australia

This program is designed to be compatible with the following operating systems:

Windows 98, Windows ME, Windows NT,

Windows 2000, Windows XP

Layer A	Organic Layer (sometimes absent)
Layer B	Mineral Layer
Layer I	Infiltration zone (sometimes absent)
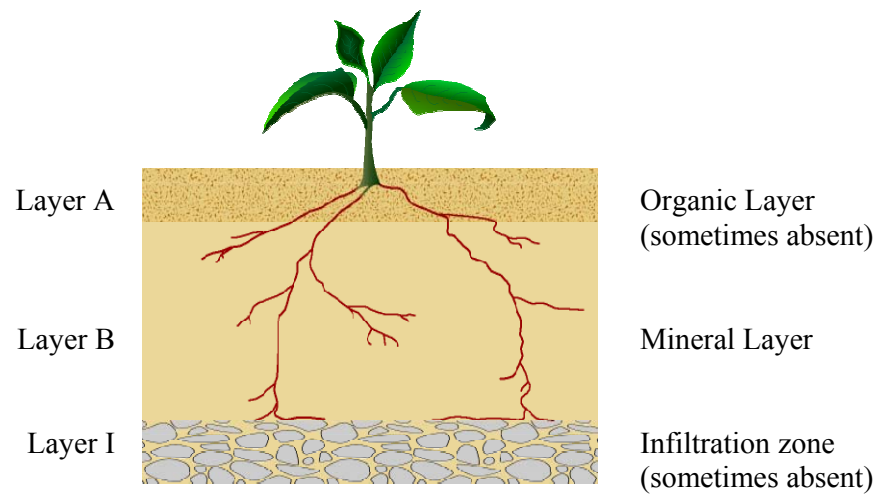
Sketch of how PlantGro views the soil.

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FOREWORD

Human beings have had an interest in plants for thousands of years—what plants can be used for, what they need, and how they can be protected from insects and diseases. From about 1850, when modern plant science began to develop, two levels of knowledge started to appear—one which was specialist, formal, and often very detailed; and the other communal and general.

For many decades these levels of knowledge were so different that extension personnel were often needed to explain the scientific understanding to the scientists' clients. However, due to the recent increase in public interest in environmental matters and wider scientific training in schools and colleges, the knowledge gap between the public and plant scientists has been reducing, especially at the whole-plant level.

One consequence of this development is that in certain societies information about plants often moves from the public to the plant scientists as well as from these scientists to the public—for example, within land care groups. It follows therefore that anyone involved in creating computerised systems about plants which are not based on highly specialist subjects should try to make them as generic and friendly as possible so as to maximise this two-way movement of information.

A novel product of this type of thinking was a land evaluation system for Papua New Guinea (Hackett 1988), in which an expert system was used to gather information on the environmental requirements of subsistence crops. This led to the development of the first version of PlantGro (Hackett 1991a), which offered a range of expert systems, provided 60 plant files covering both crops and forest trees, supplied improved methods of making predictions, and encouraged participation by users in adding to the store of plant data.

These developments were widely welcomed and led to the creation by Clive Hackett and Geoff Harris and others of an enhanced version for MS-DOS, the aim of which was to increase the friendliness of the package, double the number of plants covered, supply connections to geographic information systems (GIS's), and start evaluating multi-specie systems.

The latest version of PlantGro has brought the core developments of Clive Hackett and Geoff Harris into the world of the Windows operating system. Thus PlantGro 4.0 for Windows is much more user friendly with drop down menus and new and improved options for importing and exporting data, running batch files, and interfacing with compatible programs such as SimCLIM™ that provides the option of viewing outputs spatially and with consideration to future changes in climate extremes and variability.

From Topclimate Sevices Pty Ltd and CLIMsystems Ltd we wish you all the best in your PlantGro-inspired endeavours.

A Tribute to

Dr. Clive Hackett

"The Father of "PlantGro"
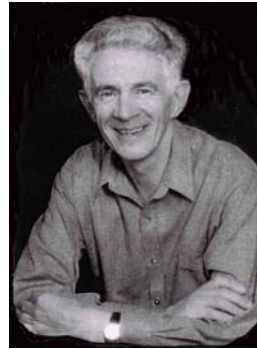
Clive Hackett was born on 22nd March 1938 and spent his early years at Highcliffe near Southampton on the southern coast of England. He attended Bounds Green Junior School and was later given a scholarship to attend the City of London School for Boys (a top private school in London). He attended Imperial College, University of London where he studied science, mainly botany, and finished his PhD in plant ecology in 1962. He then moved to Kent to do post- doctoral research at Wye College. Clive initially started his working career at the Agriculture Research Station at Letcombe Regis, and then decided to emigrate to Australia to work for CSIRO initially under a three year contract. He started his Australian Research career by working on tobacco research. He then developed computer models to simulate potato growth and eventually evolved his work to modelling a wider range of plants and predicting growth. He worked for some years at CSIRO and also at the Cunningham Laboratory in Brisbane, but travelled extensively.

In 1983, Clive was asked to find a way to predict the growth of subsistence crops in Papua New Guinea and eventually developed "Plantgro" which enables people from a wide range of backgrounds and educational experience to use their natural methods of crop assessment more productively.

Clive published extensively, producing many professional publications Books and journal papers but the crowning glory of his career was "PlantGro". As Professor Martin Parry, Director of the Environmental Change unit at Oxford University commented in a letter of Recommendation for Clive:

> *"What is most impressive is that Dr. Hackett has put considerable effort into applying his knowledge and experience in a very effective way. He has translated a concept that many people would have difficulty coming to terms with into a tool that has the potential to be used by a layperson for farm-level decision-making as well as the potential to be used in a much more analytical sense by a scientist. In realising this goal, he has shown a unique ability to communicate, not just across disciplines but in a way that bridges the gap between the specialist and non-specialist."*

In 1993 he took a retirement package from CSIRO and worked on "Plantgro" as a private consultant in Canberra until eventual retirement when his health started to fail. Clive passed away on 24th May 2005. Clive is remembered fondly by his wife, Pat, his three children (Sean, Andrew and Wendy) and many friends and associates as a kind, engaging and creative person never afraid to follow his own beliefs.

Clive's work is highly likely to be influential for many years to come. The techniques he has developed are universally applicable and can be adapted to assist with many current tasks e.g. choosing plants for land care projects, assessing possible new crop rotations, enhancing the value of international tree databases, recording personal knowledge of economically useful plants and improving on-farm decision-support systems and climate change. His work has had and is continuing to have a major influence on approaches to a wide variety of plant-related problems, both in Australia and overseas.

ACKNOWLEDGMENTS

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The Manufacturers warrant that the PlantGro™ Software will perform substantially in accordance with the on-line manual for a period of 90 days from the date of receipt. The program has been designed to operate with the Windows™ Suite of operating systems. To the maximum extent permitted under applicable law, the manufacturer's entire liability and your exclusive remedy under the express warranty is, at the manufacturer's option, limited to either (1) return of the price paid (2) repair or replacement of software if returned to the manufacturer with a copy of your receipt. The warranty is void if failure of the software has resulted from accident, abuse or misapplication.

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CHAPTER 1
INTRODUCTION

PlantGro

Welcome to PlantGro—a generic system for predicting the growth of plants. The aim of this handbook is to help you get the most out of the system and to learn about it as enjoyably as possible.

In a few pages time you will be invited to perform a trial run with PlantGro—this will tell you more about PlantGro than hundreds of introductory words. The role of the present chapter is to give you some preliminary explanation—so you can get full value from the trial run.

PlantGro's primary functions can be illustrated in a simple diagram (Figure 1). As you will see, PlantGro stores information about plants, soils, and climates and uses that information to predict plant growth performance.
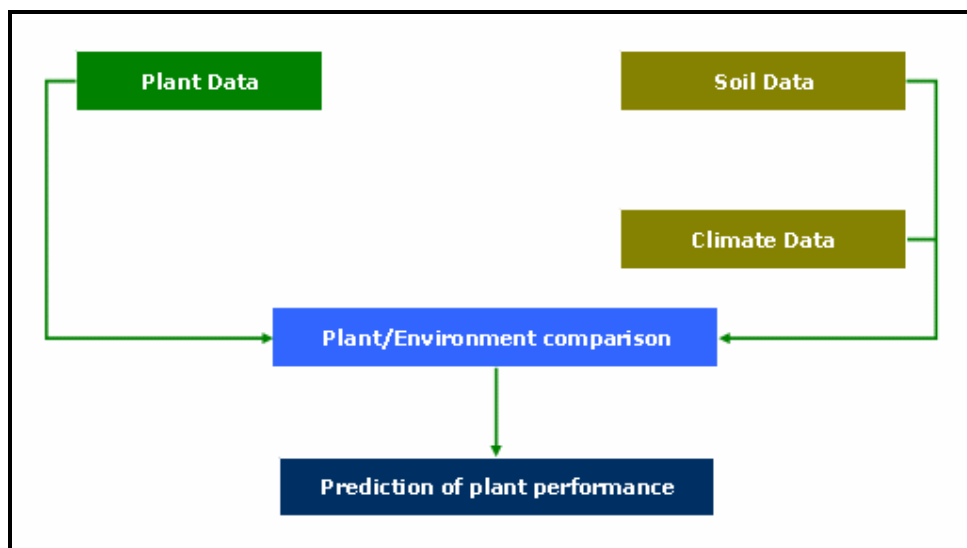
Figure 1. General view of PlantGro's functions

These operations are the same as those you do in your head when you choose a plant for a field or your garden. On those occasions you have, in your mind, information about the soil and climate the plant will experience. You then try to match a plant with that soil and climate. In some circumstances PlantGro can be better than you because it allows the consideration of plants and places for which you have no experience. Also, PlantGro doesn't get tired when there are lots of plants and places to think about!

As shown in Figure 2, the effects of environmental factors on plants are described using simple graphs which we call notional relationships. The word 'notional' emphasises that people can record what they *think* the relationship is - they don't have to have lots of data. (This is not as

dangerous as it sounds because PlantGro makes it very easy to test and improve such relationships.)
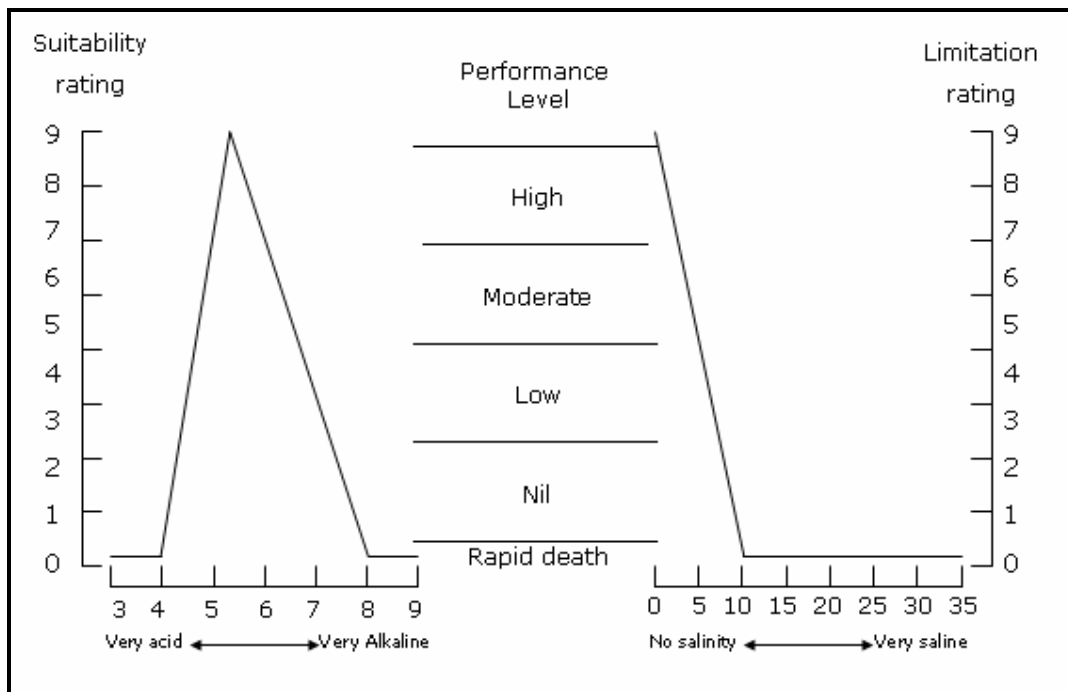
Figure 1. Examples of notional relationships: impressions of the effects of soil pH and soil salinity on Irish Potato.

To describe the relationships, a simple 0 to 9 rating system is used. Decimal portions are not permitted because greater accuracy is virtually impossible for lesser-known plants.

For descriptive purposes, plant responses are described in a positive sense because that is how most of us would draw the responses if asked. So the ratings 0 to 9, for this purpose, are given the positive name of suitability ratings (SR's).

When performance is predicted, PlantGro turns over to a negative way of thinking and looks for the biggest problem. For this work the 0 to 9 scale is inverted (see the right-hand side of Figure 2) and these ratings are called limitation ratings (LR's).

You may think that this change from positive to negative thinking in mid-stream is strange, but this is how most people's minds work. It also relates to how plants react. To them, having plenty of light, water and nitrogen is of no significance if they've been planted in a soil which lacks a vital factor such as phosphorus or potassium.

To help emphasise that the relationships really can be notional, the Figures are always created from straight-line segments. This is useful in other ways too. It encourages people to change the Figure if they have better information. It also makes it possible to record the relationship in simple numerical terms. The curves that the 'scientific' method produces are often described by complicated equations and give the feeling that

they can't be touched. In PlantGro, you are most certainly allowed to 'touch' the figure, and when you want to, you will find that PlantGro merely stores the horizontal and vertical values for the ends of the segments.

Installation

General instructions

Load the PlantGro CD into your CD-Drive. The program should then Auto-load and you should copy the operating files to a suitable directory on your hard disk. The program requires 100 MB of space to store all operating files.

If you have difficulty loading or starting the program then copy all files to c: /program files/Plantgro on your hard drive and then double click the left-hand mouse on the setup.exe file.

If you are still experiencing difficulty loading this program, please email plantgro@topoclimate.com with your contact details and outline clearly what the problem is. We will get back to you as soon as possible.

Don't forget to register your copy of PlantGro at http://www.climsystems.com/site/registration/ to become a member of the PlantGro Users group and share plant, climate and soils files with other users.

Upgrading from Version 2.1

It is recommended that you install PlantGro Version 4.0 to a new subdirectory, not the one you are currently using, eg. C:\NEWPGRO. Then copy across the data files you have modified or created from the old subdirectories. You could install the new version "over the top" of your current version, but this would overwrite any changes you have made to any of the existing data files on your system. However, totally new files that you have created would be left unchanged. Version 2.0 and 2.1 data files are fully compatible. They should be saved in a separate folder prior to the installation of Version 4.0 and then copied into the appropriate folder after installation of Version 4.0 software.

Starting PlantGro

To run the PlantGro program, click on the in your Windows toolbar and click on the icon and then scroll to the PlanGro icon and click.

You may also create a shortcut to PlantGro and place it on your Desktop for quicker access.

In either case, the main screen will be displayed, as shown in Figure 4 below.
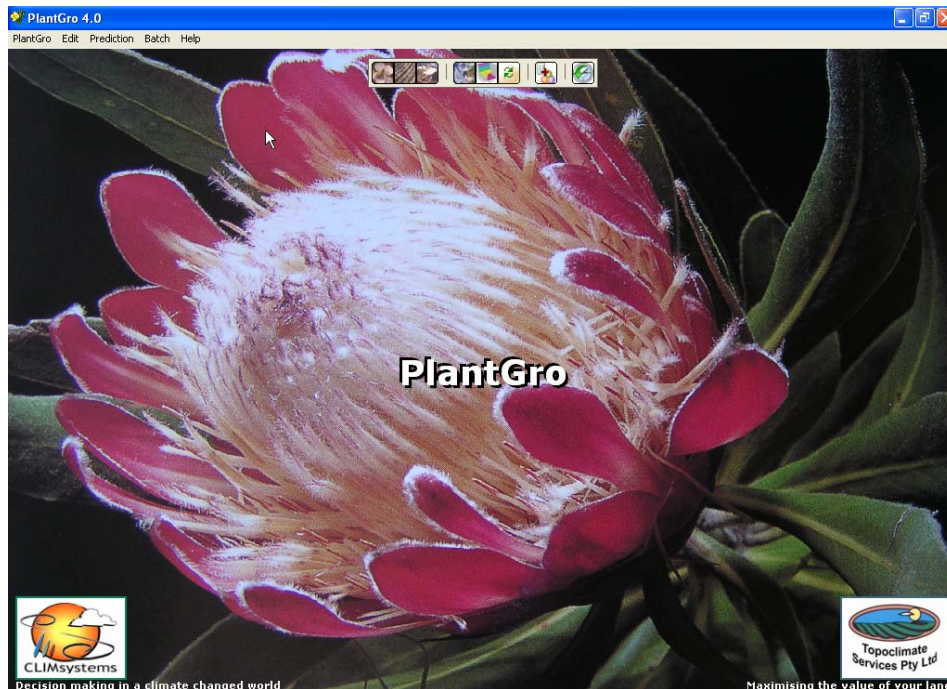
Figure 4. The PlantGro Version 4.0 for Windows main menu.

PlantGro Data Files

Most users will want to create their own Plant, Climate and Soil files at some stage, but they will want to experiment with the package first. For this reason a set of Plant, Climate and Soil files has been included with the package to help users to learn about the capabilities of the system, to familiarise themselves with the data required, or use the files as a base from which to build their own files. The location of all types of files used by PlantGro is shown in Figure 5. While it is beneficial to know the location of the files that you will be working with, typically you will access these files via the dropdown menus across the top of the PlantGro main page (Figure 4).
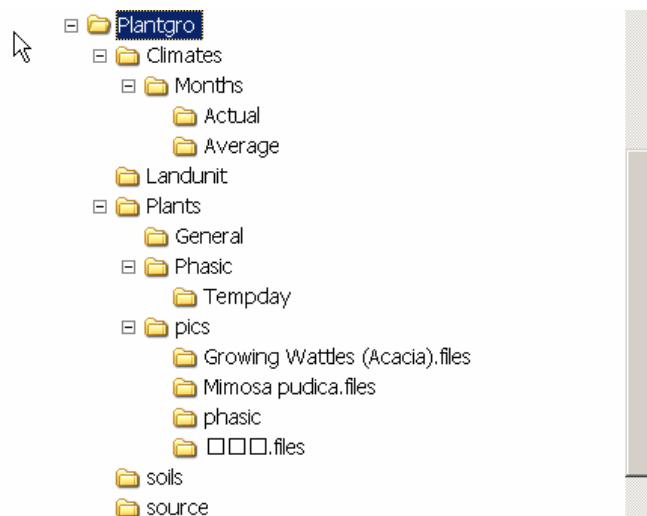
Figure 5. PlantGro's directory tree within the Program Files directory in Explorer.

CHAPTER 2 SOFTWARE OVERVIEW

Getting Started

This chapter assumes that you have installed PlantGro onto your computer and have seen the drop down menu system appear on the screen. If PlantGro has not been installed yet, please do so now. To do this, follow the instructions in Chapter 1. If you don't have access to a printer at the moment, you can use the menu system to display your output on the screen.

This chapter gives you the chance to have a trial run with PlantGro and we ask all users to work through it. If you have little or no training in computing, don't let that worry you. All you need is a little will-power—that will cause you to learn as you go, and it will prompt you to get help when needed. Soon you will find that you are doing things on your own and understand more.

Menus, Screens & Key Functions
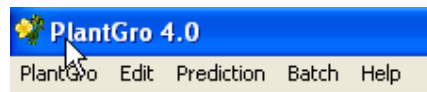
Figure 6. The PlantGro main menu.

The Main Menu bar will appear across the top of the screen when PlantGro is started. The mouse can be used to move the cursor across the main menu bar. As the cursor highlights a main menu item such as Edit Plant the icon is highlighted and you must click to proceed to that specific function. Only the Prediction and Help main menu bar options include a list of items in a drop down menu.

Data Edit Menus

Data entered into files within the PlantGro package are entered through the screens displayed when one clicks on Edit Plant or Edit Climate or Edit Soil menus. Each of the data entry screens is comprehensive in the data categories presented; in essence a one stop shop for entering data regarding a plant, climate or soil. The Edit Plant screen is depicted below.
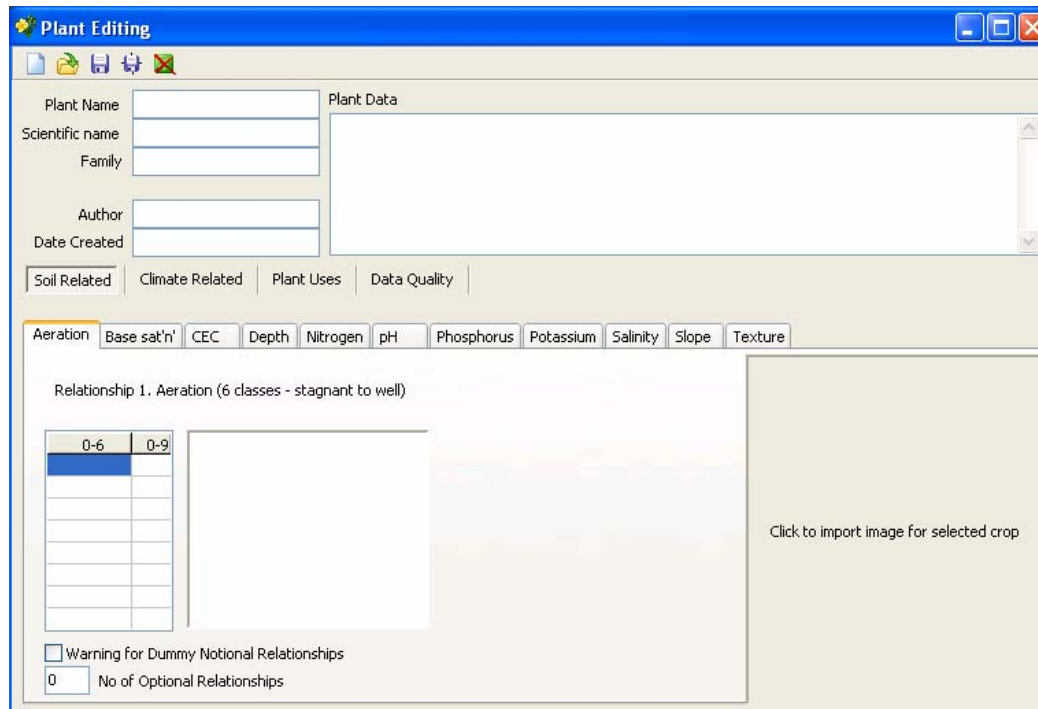
Figure 7: Plant Editing dialogue box prior to opening a file. At this level data on a new plant can be inputted.

As you will see, this screen is currently blank (no data). Two options are available at this point: open a file currently within the PlantGro system or enter data for a new crop currently not saved to the PlantGro program. To open a current plant file click on the drop down menu and choose Open.

Figure 8: Menu for working with plant files

A new window will open which lists the general plant files that come as part of the PlantGro program. Either double click on the plant file you wish to edit or click once on the file and click on to view the file in the edit Window.
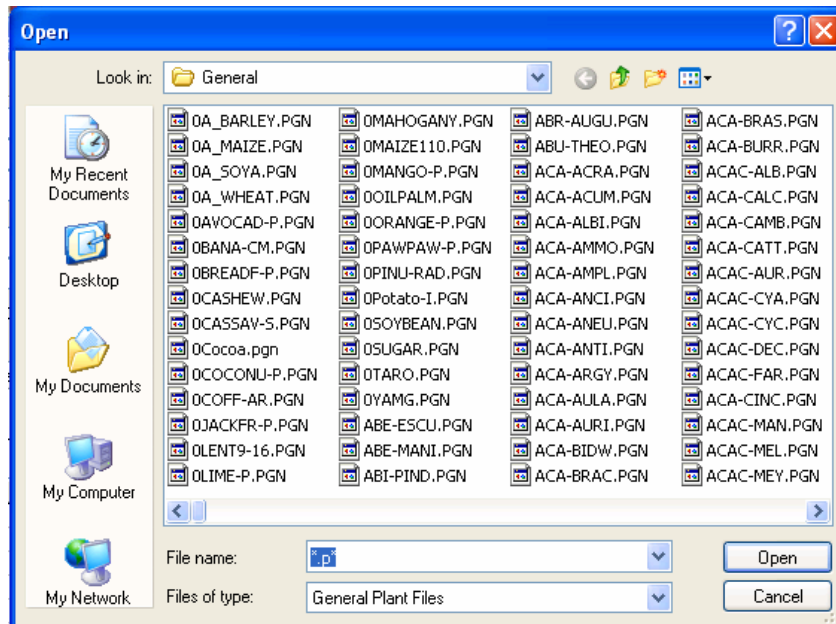
Figure 9: Plant file dialogue box where the choice of plant files for viewing or editing takes place.

The file for bananas has been opened below (Figure 10) to illustrate the type of data held in the plant file. Each parameter can be edited to suit local conditions and varietal variations. When you have completed the alterations to the plant file it is advisable to rename the file to reflect the changes and perhaps the local characteristics of the new plant file rather than replacing the file preloaded in PlantGro.
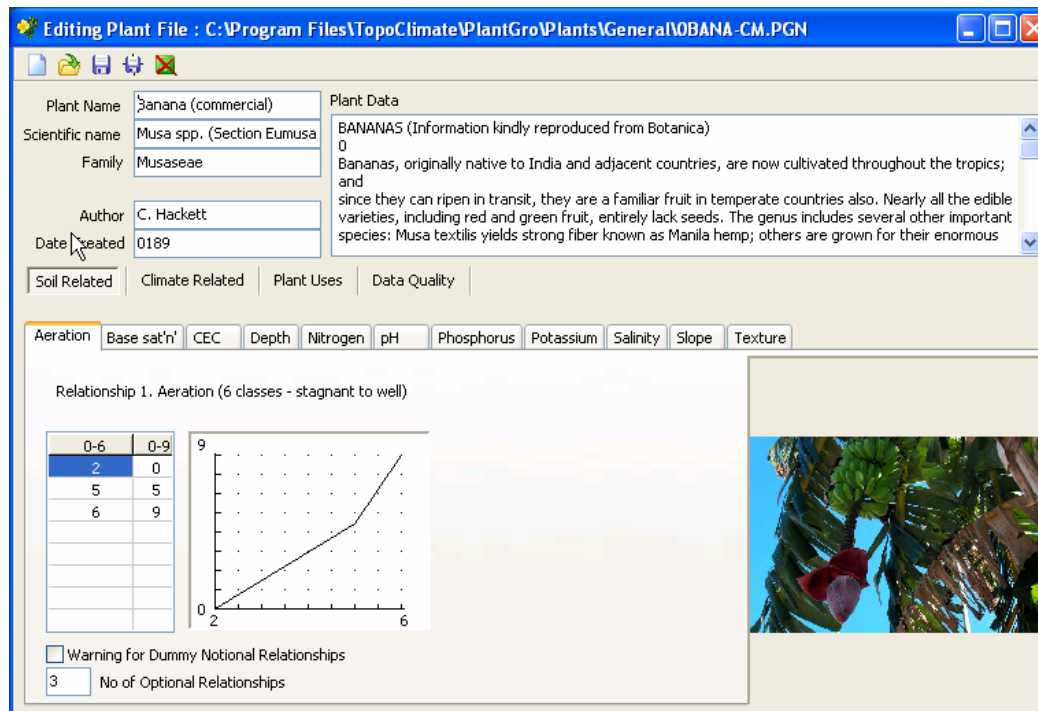
Figure 10. An example of a typical Plant Edit screen.

If the plant data file you are interested in exploring is not currently within the PlantGro suite of plants you can do one of two things. It is advisable to first search the Topoclimate Services webpage for PlantGro files made available by other users of PlantGro (http://www.topoclimateservices.com). This is one the community aspects of PlantGro whereby a growing number of plant files will become available to licensed users of PlantGro via the Users' Group. If the plant file can not be located on the Topoclimate Services webpage you will need to develop the parameters yourself from your experience and available literature. If you require assistance in completing this task contact Topoclimate Services at *plantgro@topoclimate.com* and staff will work with you to develop the required plant file.

Adding Additional Information to Plant Files

We encourage the users of PlantGro to customise the plant files that they use regularly. Depicted below is a standard Plant File for avocado, as provided with the PlantGro program. As you become more familiar with the program and its attributes and as your knowledge of the plants that you are working with increases, additional information can be added to you plant files. Having this information at hand, quickly and easily, when running predictions will speed and improve your decision-making. The red box highlighted below is an excellent place to load additional information on individual plants. It is just a matter of typing the information in or copying (ctrl c) and pasting (ctrl v) it from another electronic source.
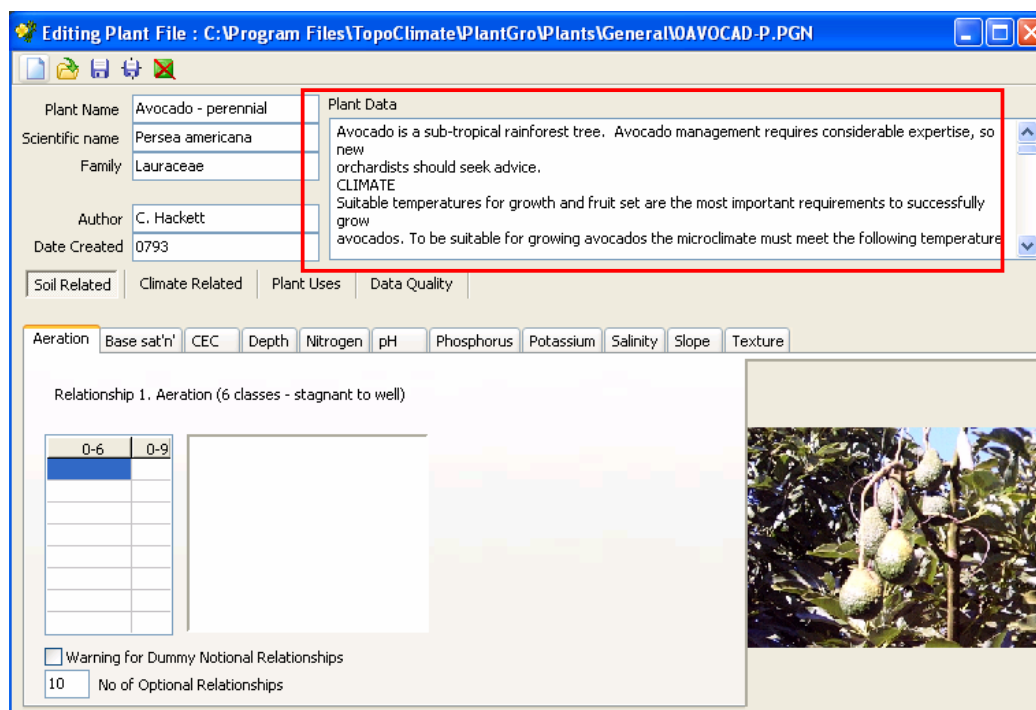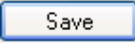
Figure 11: Editing a Plant File dialogue box with Plant Data
entry box highlighted.

The figure below shows the same part of the Edit Plant File for avocado but with additional information added to the plant file window. Other parts of the file can also be improved. A new photo can be added to reflect conditions in your area or other uses for the crop may be entered in the

tag **Plant Uses** . For example, avocado can be used for fruit and/or oil. Be sure to consider if it is of value to change the file name once you have added additional information to the Plant File. It is suggested that a new file name be chosen when you save the additional information. The program will ask you if you wish to save the file if you attempt to close the file after making alterations. Note: the program will not prompt you to enter a new file name when you are asked if you wish to save changes. If you wish to rename the changed file you MUST got to the **toolbar** and click on and then confirm that you are in the general plant files directory (if that is indeed where you wish to save the file), type in the new name for the file and click **Save** .

Plant Data
```
Avocado is a sub-tropical rainforest tree.  Avocado management requires considerable expertise, so
new
orchardists should seek advice.
CLIMATE
Suitable temperatures for growth and fruit set are the most important requirements to successfully
grow
avocados. To be suitable for growing avocados the microclimate must meet the following temperature
```

Figure 12: Plant Data dialogue box where additional information on individual plants can be added and edited.

Windows similar to Plant Data are also available in the Edit Climate and Edit Soil dialogue boxes but are termed things like Special Reasons for Interest, Remarks and Brief Description. They all function in the same way as the Plant Data dialogue box. We suggest that they all be used extensively as you customise the PlantGro program to your specific needs.

Edit Climate

As with the Edit Plant menu, clicking on the Edit Climate main menu tool opens the following comprehensive climate editing and climate data entry screen.

Figure 13: Climate Editing dialogue box for entering new climate site data.

The toolbar provides the user with access to a range of options from modifying data files already preloaded in the PlantGro program to the loading of data for your particular local.

Figure 14: Toolbar menu for opening preloaded climate files, saving changes to files and creating new files among other standard operations.

The following file is derived from the PlantGro data file folder and represents the range of data variables that may be required for predicting the adoptability of a particular plant to an environment.

Editing Climate File : C:\Program Files\TopoClimate\PlantGro\Climates\Months\Average\BANGKOK.CMV

Climate Site: Bangkok
Country: Thailand
Latitude: 13
Longitude: 100 E

Elevation: 2
Met Station Name and No:
Soil Link Files:
Author: Anne Bennett

Date: 0291
Providers Name: self
Printed source of Data: FAO Asia 1987

Special Reasons for Interest:
PGRO

Remarks:
Climate classification "Aw"
Tropical Savanna.
Rainy climate with distinct dry season.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall - av mean mthly (mm)	9	28	29	79	176	159	163	182	312	218	50	11
Evaporation - av mn mtly (mm)	140	154	194	199	186	172	166	163	148	150	140	131
Irrigation/other water (mm)	0	0	0	0	0	0	0	0	0	0	0	0
Flooding (1/0)	0	0	0	0	0	0	0	0	0	0	0	0
Day Length ave daily (hrs)	12	13	13	13	14	14	13	13	13	12	12	12
Solar Radiation (MJ/m^2/day)	19	20	22	22	20	19	18	18	17	18	19	18
Temp - av mn mtly max (°C)	28	29	31	32	31	30	30	30	30	29	28	28
Temp - av mn mtly min (°C)	24	26	28	29	28	27	27	27	27	26	25	24
Temp - brief cold (°C)	20	23	24	26	25	25	25	25	24	24	23	21
Wind - average (km/hr)	4	7	7	7	7	7	7	7	4	4	4	4
Wind - extreem (km/hr)	0	0	0	0	0	0	0	0	0	0	0	0

Figure 15: Data from a climate file loaded in the Edit Climate dialogue box.

Files and Data Storage

Data files used within PlantGro are stored under separate directories depending on their type and content. It is necessary for users to adhere to the directory structure if files are to be moved in or out of the package using Explorer or a File Management system.

Any number of files may be stored in each directory. They are stored in alphabetical order and can be rapidly found if you type the first letter of the file you wish to find with the directory open (Figure 16). A scrollable list of files starting with that letter will appear in the file name dialogue box and you can then scroll and double click on the file you wish to open.
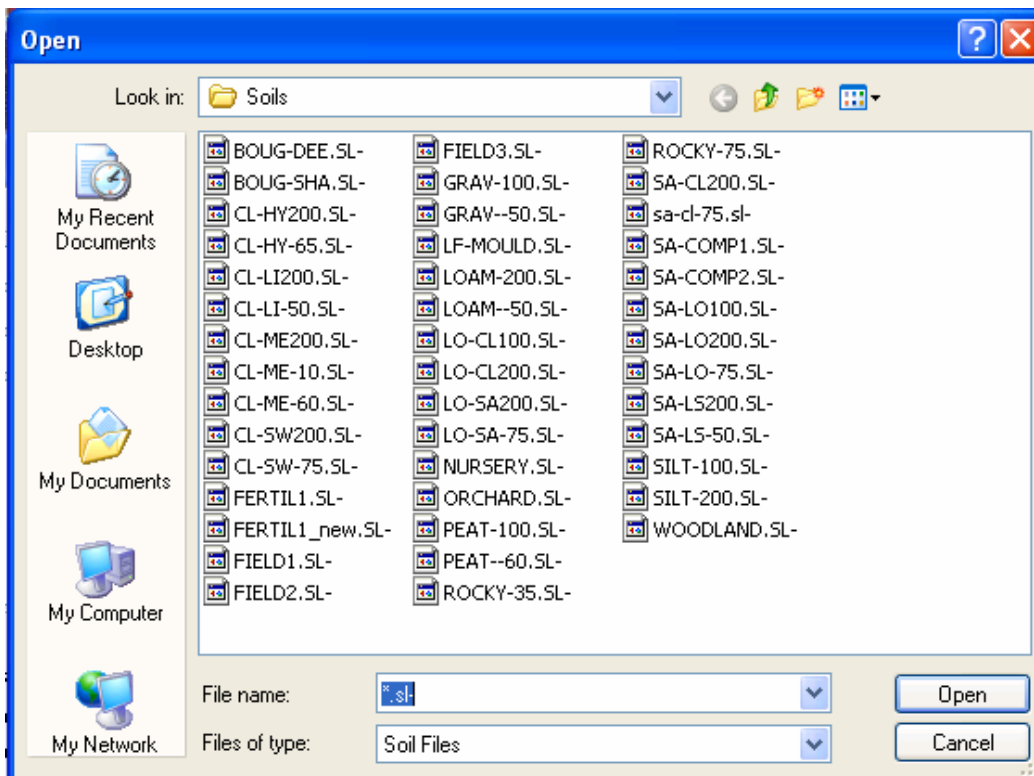
Figure 16: Soil file directory.

Any excess files should be managed within Explorer or your file management software and deleted if not required.

File Names

File names are not limited in terms of length, but they must not contain any blank spaces or full stops. It is best to make them as descriptive as possible so that you are readily aware of what any new files pertain to.

For Phasic Plant Files, users should follow the established file-naming pattern to ensure that the files are listed within the package in their natural order. This pattern requires the last character of each Phasic file name to be a numeral such that the initial phase of each plant is numbered with a "1", the second phase with a "2" and so on. When a listing of the files is called up within the system, it will then be displayed in order of the plant's life cycle, instead of in the usual alphabetic ordering style.

File name extensions are added automatically when a file is created according to the file type, contents and location. The Extensions used within PlantGro and the file type to which each extension relates are depicted in Figure 17.

Extension	File type and contents
CML	Climate with Monthly Actual Data
CMV	Climate with Monthly Average Data
CTL	Climate with Ten day Actual Data
CTV	Climate with Ten day Average Data
CWL	Climate with Weekly Actual Data
CWV	Climate with Weekly Average Data
GIS	Plant File which has been converted to a format suitable for providing data for a Geographical Information System (GIS) or plant database
GRO	Prediction File Output
PGN	General Plant File
PTD	Phasic Plant File
SL	Soil File
PGB	Batch File

Figure 17: File name Extensions and the file type to which they correspond, as used in PlantGro.

General Purpose Names

Upon creating a file, the user is asked to supply either a Common, General Purpose or Scientific name. This name is used to order and present file lists alphabetically when the system requires selection of a file by the user.

The use-of General Purpose or Scientific names is intended to overcome the difficulties involved in identifying files by their file names. It is strongly recommended that users give all files created a uniquely identifiable name of this type and make the first two or three letters in the name the same as in the file name.

Prediction

There are three levels of prediction incorporated in the PlantGro systems.
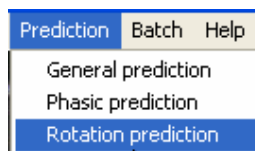
Figure 18: Dropdown menu for choosing the type of prediction to be accomplished.

The most basic is the general prediction and is first described before the more detailed Phasic and Rotation prediction.

Making a First Prediction

Program steps

The process of generating a general prediction is fairly straight forward. An example for Irish potato grown in Canberra will be demonstrated.

Open the Prediction dialogue box and click on the General prediction to reveal the CalcSinglePLantForm dialogue box for browsing to the data sets required.
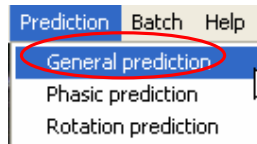
Figure 19: Click on the General prediction option to begin.
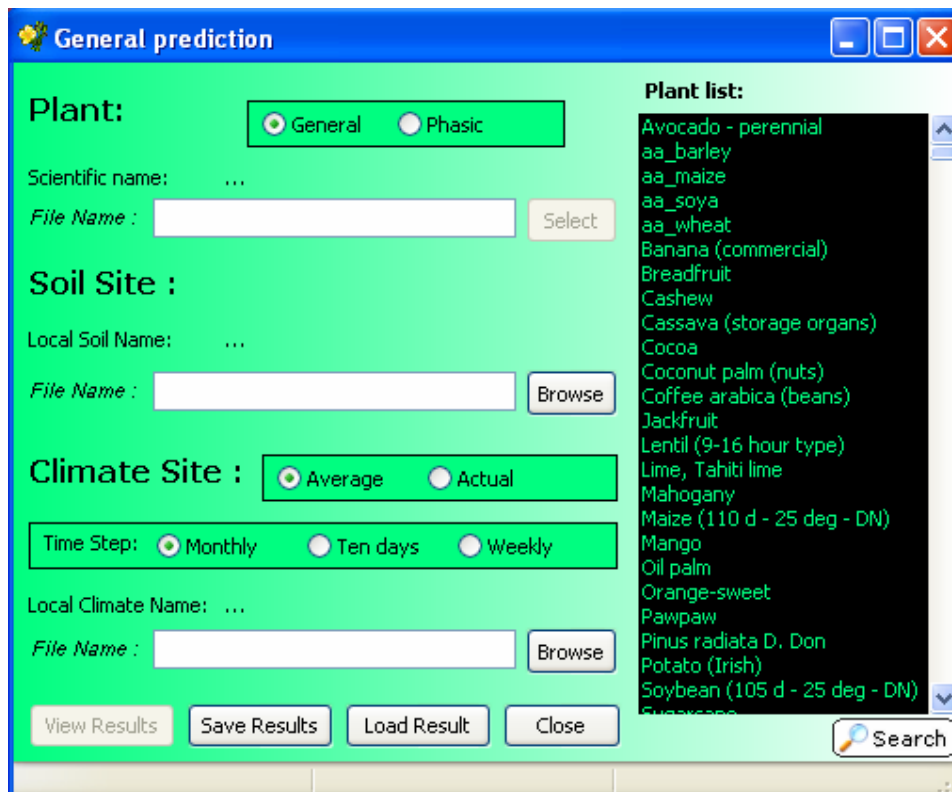
Figure 20: General prediction dialogue box listing plant, soil and climate site variables.

Plant files (by scientific name) held in the plant file folder are displayed in the column to the right. Simply click on the plant you are interested in investigating or highlight it and click on [Select]. Appendix One of this manual includes a complete list of cross referenced plants with their scientific and common names. Refer to the list if you are unsure of the name associated with the plant you wish to run a prediction for.
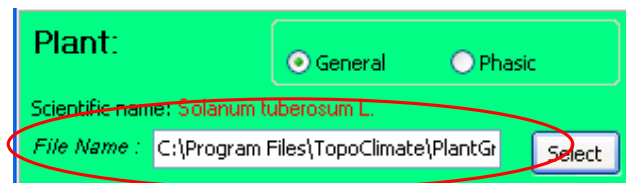
Figure 21: Plant option dialogue box.

Select the Potato (Irish) from the list by double clicking. It will now be entered on the File Name dialogue box circled in red above. Scroll along the dialogue box to confirm that the appropriate file has been loaded in the Prediction dialogue box.

Next click on Browse within the Soil Site dialogue box to display the range of soil types available. Select the Loam + sand (75 cm) soil file.
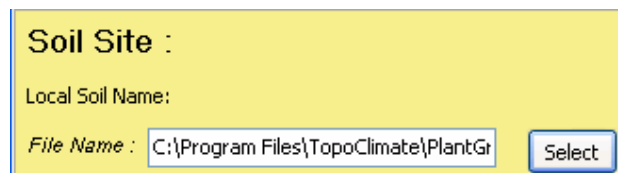
Figure 22: Soil Site option dialogue box.

The final data set to load is that for Climate Site. Again, click on the Browse icon and then select the file of your choice. In this case, find the Canberra Garden data set and double click on it or click on it once, then click on the Select icon.
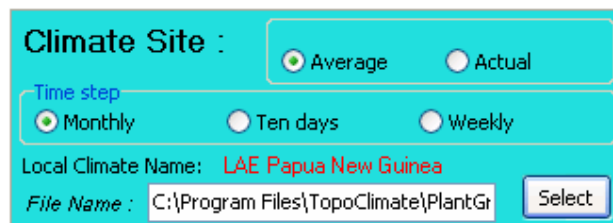
Figure 23: Climate site dialogue box.

The final selection is for the graphic depiction of results, display of the prediction details or both. Click on View Results .
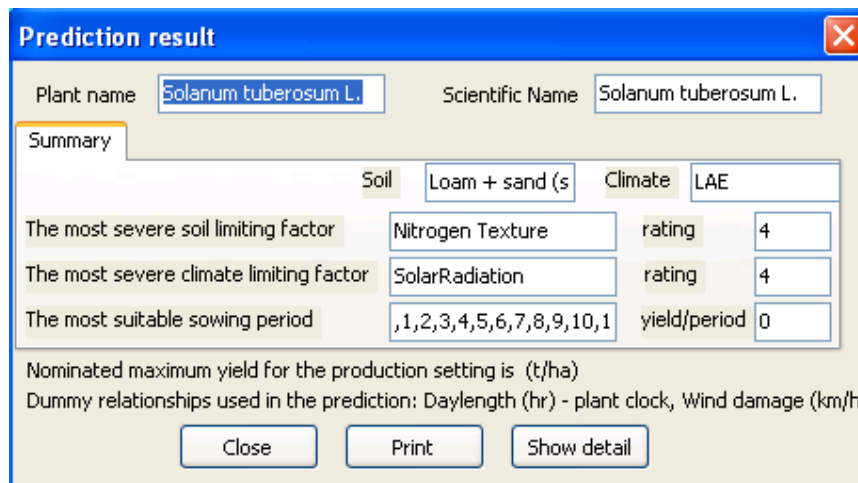
Figure 24: Summary prediction results dialogue box.

A summary of the prediction results is then displayed which includes a definition of the most severe soil limiting factor, the most severe climate limiting factor and the most suitable sowing period. The ratings for the limiting factors are also provided as detailed in Chapter 4. In this case the soil limiting factor could reduce yield by as much as 40 percent while the severe climate limiting factor of brief cold could be fatal to the plant.

It is worth while exploring the detailed file for the Irish potato in Canberra. To do this simply click on the Show detail icon at the bottom right of the prediction results dialogue box and the following details will be displayed.
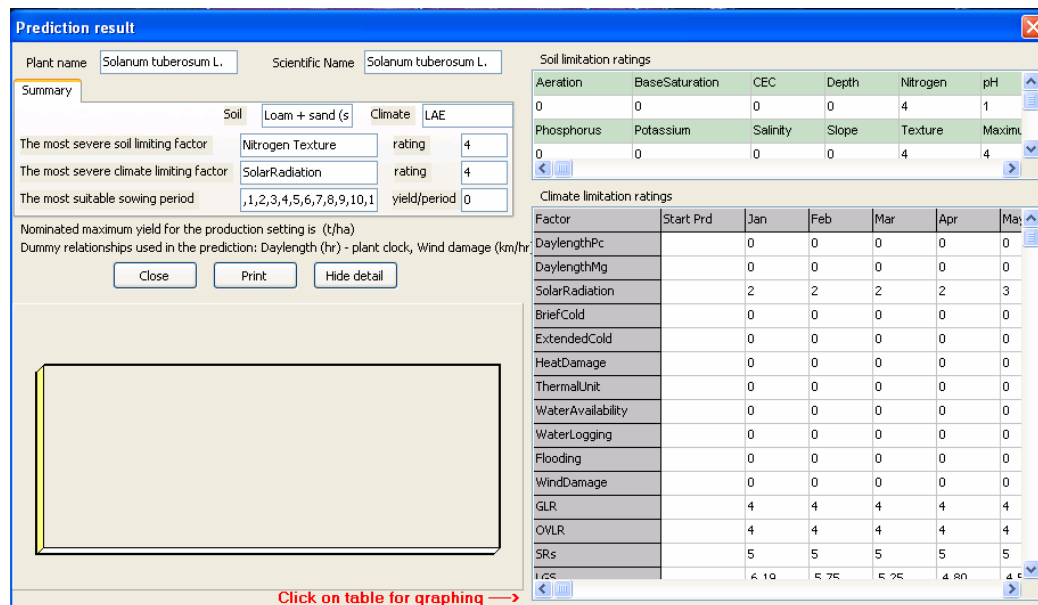
Figure 25: Detailed Prediction Results dialogue box.

It is useful to look at the climate limitation factors in graphic form. To do this simply click anywhere within the line of the chart, for example in the line for brief cold and a graphic will be displayed in the window to the left that depicts the rating for this particular variable. In this case the cold of

Canberra in June, July, August is fatal to the Irish potato. The months of April and October are marginal while the remainder of the year cold weather is of no risk. You can choose to print these graphs for future referral.
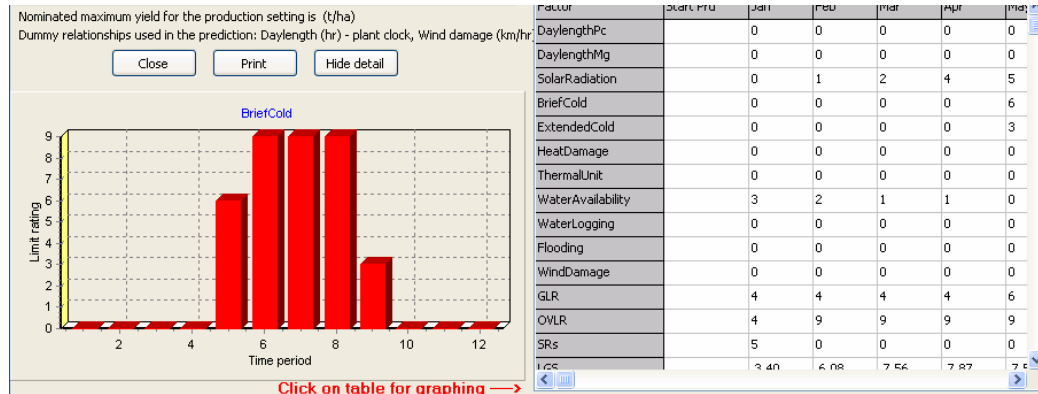
Figure 26: Graphic display of individual Climate limitation ratings.

The horizontal scale represents time and the vertical axis the limit rating for each variable defined in the detailed listing of the Canberra garden's soil and climate for potato. These graphs are not stored as yet in PlantGro but give an initial impression of the overall results.

Prior to making another selection you may wish to print the output from the general prediction for comparison with future predictions. Simply click on the print icon in any of the dialogue boxes displaying results and the results will be printed on the nominated printer. The view of what will be printed will be generated as depicted below:
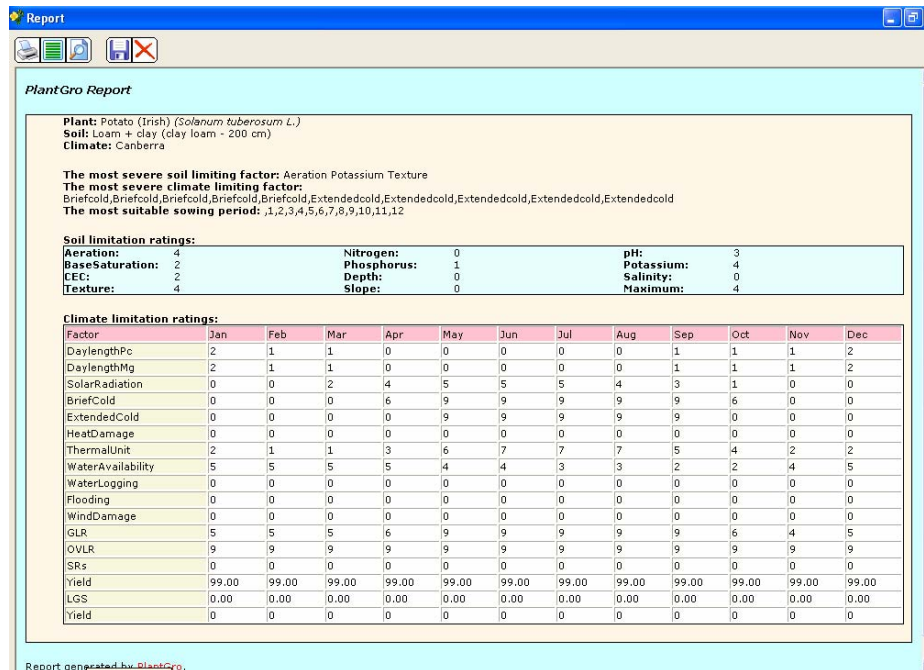
Figure 27: Summary of Limiting Factors for Irish potato cultivation in Canberra.

If you wish to proceed to print the page click on the printer icon ⎙ on the top left of the dialogue box. The other icons at the top of the page allow you to zoom 🔍in on the data sheet, and adjust the page setup.

Detailed data for this prediction may be viewed or printed at any time in the future. To save the prediction file click on the 💾 icon and direct it into a directory of your choice. You may wish to name the directory in relation to the project currently being worked on so as to easily identify it in the future.

Interpreting the Printout

If you don't have any formal training in plant science, don't let yourself get worried by the amount of information contained in the printout. Just concentrate on the main components. Get an impression of what they do and try to relate the output to the work you have in mind for PlantGro.

Soil limitation ratings					
Aeration	BaseSaturation	CEC	Depth	Nitrogen	pH
6	2	1	0	0	2
Phosphorus	Potassium	Salinity	Slope	Texture	Maximu
0	0	0	0	4	6

Figure 28: Soil limitation ratings dialogue box.

Climate limitation ratings						
Factor	Start Prd	Jan	Feb	Mar	Apr	N
DaylengthPc		0	0	0	0	0
DaylengthMg		0	0	0	0	0
SolarRadiation		0	1	2	4	5
BriefCold		0	0	0	0	6
ExtendedCold		0	0	0	0	3
HeatDamage		0	0	0	0	0
DevelopmentUnit		1	1	0	3	6
WaterAvailability		3	2	1	1	1
WaterLogging		0	0	0	0	0
Flooding		0	0	0	0	0
WindDamage		0	0	0	0	0
GLR		6	6	6	6	6
OVLR		9	9	9	9	9
SRs		0	0	0	0	0
LGS		99 00	99 00	99 00	99 00	0

Figure 29: Climate limitation ratings dialogue box.

Figure 30 tells you who made the plant-file, what sources were used, and what its current quality is. This page helps you to check that you have

used the file you intended to and tells you how far you can trust the file. Because this page lists key data in the plant file, it can also help you to understand why results from the prediction turned out as they did.

Prediction result

Plant name: Solanum tuberosum L. Scientific Name: Solanum tuberosum L.

Summary

Soil: Loam + clay (cl Climate: Canberra

The most severe soil limiting factor	Aeration	rating 6
The most severe climate limiting factor	Briefcold,Briefcold,Briefc	rating 9
The most suitable sowing period	,1,2,3,4,5,6,7,8,9,10,1	yield/period 0

Nominated maximum yield for the production setting is (t/ha)
Dummy relationships used in the prediction: Daylength (hr) - plant clock, Wind damage (km/hr)

Close   Report   Hide detail

Water Availability (graph, Limit rating vs Time period)

Click on table for graphing ⟶

Soil limitation ratings

Aeration	BaseSaturation	CEC	Depth	Nitrogen	pH
6	2	1	0	0	2
Phosphorus	Potassium	Salinity	Slope	Texture	Maximu
0	0	0	0	4	6

Climate limitation ratings

Factor	Start Prd	Jan	Feb	Mar	Apr	M
DaylengthPc		0	0	0	0	0
DaylengthMg		0	0	0	0	0
SolarRadiation		0	1	2	4	5
BriefCold		0	0	0	0	6
ExtendedCold		0	0	0	0	3
HeatDamage		0	0	0	0	0
DevelopmentUnit		1	1	0	3	6
WaterAvailability		3	2	1	1	1
WaterLogging		0	0	0	0	0
Flooding		0	0	0	0	0
WindDamage		0	0	0	0	0
GLR		6	6	6	6	6
OVLR		9	9	9	9	9
SRs		0	0	0	0	0
LGS		99.00	99.00	99.00	99.00	9

Figure 30: Dialogue box displaying all the details of a general prediction.

In Figure 30 the upper panel deals with the soil characteristics and the plant's responses to them. You may not understand all the terms and units at this stage, but you can see that a wide range of soil factors is covered. You can see too that the soil data are printed out, which means that you can check that you used the soil file you intended to and can see what the soil was like.

One entry on the top left panel contains the greatest soil limitation ratings. These show the difficulties the plant would have with the soil. In this case aeration and potassium are the greatest soil limiting factors. The detailed results dialogue box makes it obvious when there *are* difficulties and it shows how serious they might be.

Now have a look at the lower right panel—Climate limitation rating. Again there may be things you don't understand, but three things are apparent:

(i)   like the soil data, the climate data are displayed for checking purposes;

(ii) light (called DaylengthPc, DaylengthMg and Solar radiation in the output), temperature and water are covered fairly comprehensively;

(iii) several of the rows of data are immediately interpretable. Even though the lower panel looks a bit 'heavy' at first sight, it is obvious that it describes the seasonal conditions the plant will have to contend with and presents that information in an honest and friendly way.

Climate limitation ratings

Factor	Start Prd	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	(
SolarRadiation		0	0	2	4	5	5	5	4	3	1
BriefCold		0	0	0	6	9	9	9	9	9	6
ExtendedCold		0	0	0	0	9	9	9	9	9	0
HeatDamage		0	0	0	0	0	0	0	0	0	0
ThermalUnit		0	0	0	0	0	0	0	0	0	0
WaterAvailability		6	5	5	4	2	1	2	3	4	4
WaterLogging		0	0	0	0	0	0	0	0	0	0
Flooding		0	0	0	0	0	0	0	0	0	0
WindDamage		0	0	0	0	0	0	0	0	0	0
GLR		6	5	5	6	9	9	9	9	9	6
OVLR		5	9	9	9	9	9	9	9	9	5
SRs		4	0	0	0	0	0	0	0	0	4
LGS		3.07	4.40	7.22	7.62	99.00	99.00	99.00	99.00	99.00	
Yield		17.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1

Figure 31: The red box highlights the overall results.

The first item in the highlighted box is *greatest limitation rating* which summarises the greatest limitation of all the factors above and permits the viewer to determine months when the limitation factor is not fatal to the plant (9). However, even if a fatal reading is determined it does not mean that the crop can not be cultivated. It may simply mean that a management regime must be instituted to overcome the limitation.

The OVLR or *overall limitation rating* (0 to 9) represents a rating for that phase of plant development. It is based on the lethal limitation if there is such or on the average of the limitations for the particular plant and its phase of development.

The SR or suitability rating is ranked between 0 and 9 with 0 being unsuitable and 9 being highly suitable. Again, the suitability can be modified by management so this number must be looked at in conjunction with all the others in the summary section.

The LGs or length of growing season reflects how long it would take for the plant to mature to harvestable age under conditions prevalent during that month. This is an important consideration. Management can overcome some soil limitations but climate can limit plant development and ultimately yield and quality of the crop.

The final data row is for potential yield. Not all crops have enough information within the data file to make an assessment of this type. It is only indicative but studies with some crops have found these yield predictions to be highly reliable (CSIRO 1996).

If death is predicted to occur before the end of the growing season, the LGS will be printed as 99.

When you feel you understand the basics of the prediction output, make a prediction for potato again but with a different climate. You are likely to see considerable changes in the output data, which will help you understand what PlantGro is doing.   Then do a similar exercise by choosing a contrasting soil.

Finally, before you go to the next chapter, please notice one more thing about the outputs you have produced. This is that the graphs and charts of limitation ratings show whether or not you might be able to improve the plant's performance by alleviating the predicted problems.   For example, if the main problem is lack of nutrients, it might be cheap and easy to add some fertiliser. You can then work out by eye what effect this might have on overall performance.   If, however, the main problem is poor aeration, you may feel that too much money or labour would be needed.   It would then be wise to choose another site where the soil's aeration is more favourable.

CHAPTER 3
UNDERSTANDING THE
DATA FILES

Introduction to the Data Inputs

Figure 32 shows the subdirectories used by PlantGro to store its programs, inputs, and outputs. You can think of the subdirectories as filing boxes. Those which have something in them are hatched. The others are merely junction boxes.
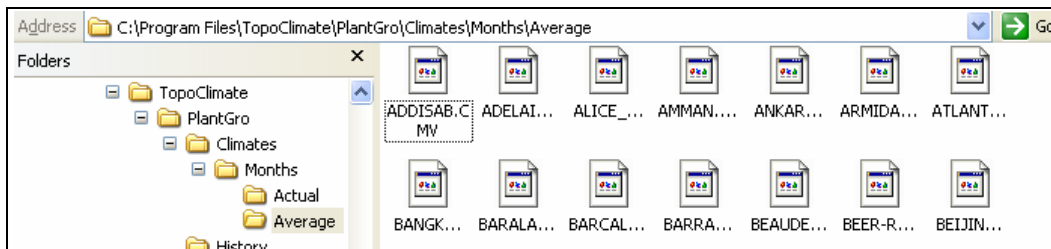
Figure 32. The subdirectory structure of the PlantGro system using the sample of Plantgro\Climates\Months\Average.

Both this chapter and the next deal with the subdirectories called CLIMATES, SOILS, and PLANTS. PlantGro provides a range of methods for handling the data in the subdirectories, but if you want to move a file from one subdirectory to another, which will rarely happen, you can simply drag and drop the files from one directory to another.

What you do from here on is entirely up to you. The handbook continues in a logical sequence, but if you know a lot about plants already or are a lateral learner, feel free to move about the menu system as you like.

For those, however, who prefer a more linear process of learning, we next explain the data inputs which PlantGro uses, beginning with the soil inputs. Don't worry at this stage about how you are going to get the data you need. Just concentrate on its nature. You'll find later that getting the data will often be easier than you imagine.

Before we go on now, there are a few general things to say. One of these is that PlantGro is based solely on the plant's view of the world. For example, if you find that PlantGro says that a crop can be grown on a 35 degree slope, it only means that all will be well from the *plant's* point of view. What you think about the slope in relation to the use of machinery is a management matter, not a growth matter. The current version of PlantGro cannot help in any formal way with that judgement.

We have made this distinction between the plant's view and your view because it is the only way to make PlantGro universal. If we had tried to allow for human views, we would have needed overlays for each human culture and each level of economic resources. Another thing you need to know is that there is a major difference in PlantGro between:

(a) the way of estimating the stresses the plant has to face, eg. water stress; and,

(b) the way of estimating the plant's responses.

In the first case, PlantGro often considers several factors when estimating a stress, eg. rainfall, evaporation, soil depth, and soil texture are considered when estimating water stress. In the second case, it usually deals with factors individually.

This contrast is possible because the environment and the plant are totally different things. In the environment, the soil, the rain, and evaporation have no organised connection with each other. Within the plant there are control systems. At the PlantGro level of description, we can often think about factors individually because the plant's growth is mostly determined at that level - by the greatest limiting factor. (Chapter 10 in Hackett 1988 gives more background information on this subject.)

We must also mention that absolute units (eg. tonnes per hectare) are not always used in PlantGro when describing performance. This is because PlantGro has to cater for many plants for which this might be difficult—eg. weeds, garden-plants, and isolated timber trees.

If you do need absolute units where they haven't been provided, PlantGro enables you to provide them yourself. PlantGro's predictions are made in terms of limitation ratings 0 to 9, where 8 means 'slow death,' eg. due to shortage of nutrients, and 9 means 'rapid death,' eg. the effect of an overnight frost.

PlantGro's yield scale therefore has 8 steps, with LR 0 relating to 100% performance, LR 2 to 75%, LR 4 to 50%, LR 6 to 25%, and both LR 8 and LR 9 to 0%. If you think that 16 t/ha is the best yield obtainable from a particular production system, you can work out that LR 0 = 16 t/ha, LR 2 = 12, LR 4 = 8, LR 6 = 4, and LR 8 and 9 = 0 t/ha.

Plant Files

General Information

Plant data files mainly hold sets of notional relationships which represent an individual plant's expected responses to selected environmental factors. Predictions in PlantGro are largely centred around comparison of these relationships with nominated soil and climate conditions. Thus, PlantGro decides whether the conditions are likely to be favourable or not.

A set of standard plant data files is packaged with PlantGro. The Plant Files are placed in one of two sub-directories according to whether they are classed as General or Phasic.

If a great deal is known about a plant, a Plant File can be made for each phase of its life cycle. These files are referred to within the PlantGro system as Phasic Plant Files and are stored in the \Plants\Phasic\Tempday directory.

If less is known about a plant, then General files are made. These are then stored in the Plants\General directory. They constitute the majority of Plant Files for use in predictions.

Occasionally there is a need to use a Phasic file in the General Directory. This can be arranged. The file extension .PTD must be changed to .PGN.

Plant Data

A wide range of data is contained within a Plant File, but the type of data required for the General and Phasic file types is identical. Each factor considered in the Plant File will now be described in general terms.

Notional relationships are stored in PlantGro by recording the x,y co-ordinates of the ends of the segments in each relationship. You will notice, too, that the numbers 111 and 999 appear in the file. These are used to mark the end of each set of x,y entries. They also help to keep the file structure constant, which makes editing more reliable.
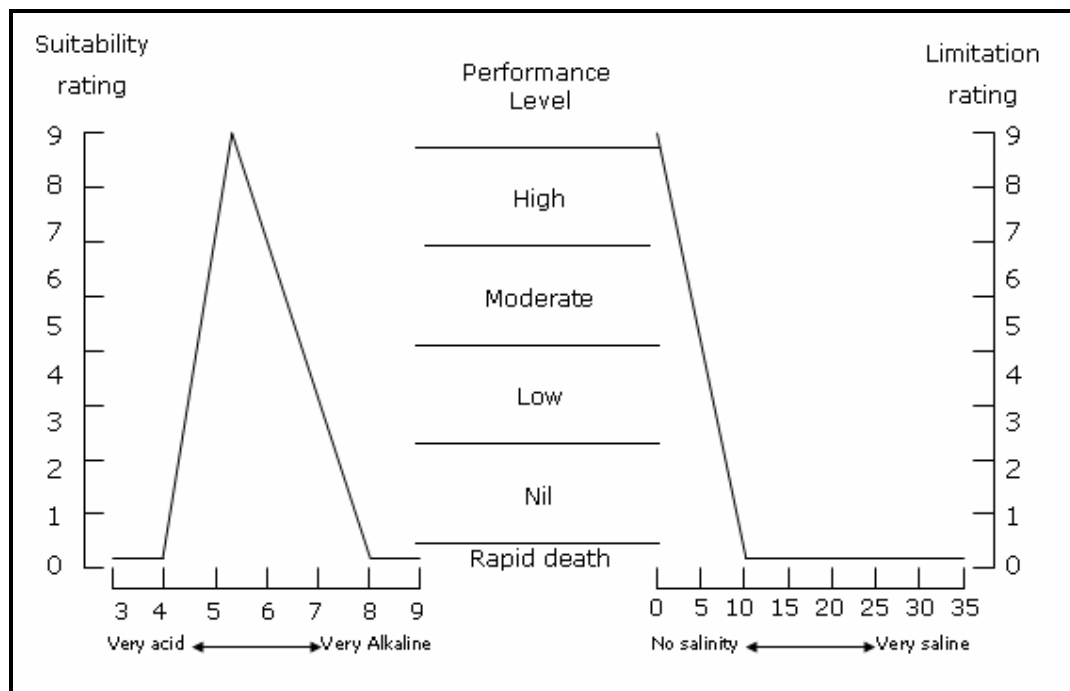
Figure 33. Examples of notional relationships: impressions of the effects of soil pH and soil salinity on Irish potato.

To help emphasise that the relationships really can be notional, they are always drawn using straight line segments, see Figure 33 above. This is useful in other ways too. It encourages users to change a relationship if they have better information, and it is possible to record the relationship in simple numerical terms. To do so, remember that the Plant Files are made up of sets of relationships like those shown in Figure 34.

Factors Dealt with in the Plant Files

1 Aeration.

Aeration relates to the availability of oxygen to the root system and is mostly associated with the size of soil pores and the proportion of pores filled with water. PlantGro deals with soil aeration classes, using six classes from swampy-stagnant to well aerated. The soil medium's natural aeration characteristics are to be considered here, regardless of seasonal fluctuations. The influence of rainfall on oxygen supply is considered under "Seasonal Waterlogging."

2 Base Saturation.

Base saturation is expressed as a percentage of Cation Exchange Capacity (CEC) and indicates the proportion of exchangeable positive ions in the soil which are of value for plant growth. Very favourable values are c.70%. Very unfavourable values are c.15%. Plants do not respond directly to base saturation. For this reason, none of the three options available in PlantGro are allowed to kill the plant.

3 Cation Exchange Capacity (CEC)

Cation Exchange Capacity (CEC) is a measure of the ability of a soil to retain positive ions such as calcium and potassium against leaching. The units used in PlantGro are meq/l00g soil (q.v.). CEC estimates usually include positive ions (cations) which are not required by plants or are harmful to them. Base saturation indicates the proportion of CEC which is beneficial to plants. Very favourable values are c.35 meq/l00g soil. Unfavourable values are c.8 meq/l00g soil. As with "Base Saturation", plants do not respond directly to CEC. Therefore no option is allowed to kill the plant.

4 Depth - Potential Rooting Depth (PRD) & Non-Limiting Root Depth (NLD)

Depth of soil

In PlantGro, this means the depth of soil which could be penetrated by roots, were they long enough. It is also called the overall depth of soil. PlantGro recognises up to two layers of root-penetrable soil and beneath them there can be an infiltration zone which roots cannot enter but water can.

PRD & NLD

Potential Rooting Depth (PRD) must be equal to or greater than Non Limiting Rooting Depth (NLD). NLD is that depth which allows a nominated plant to function effectively in physiological terms - eg. so that the relationships between the shoot system and the root system work well. This is a fuzzy concept but most people can make a fair judgement.

PRD is the maximum depth the nominated plant's root system can reach if there are no physical limitations to growth. Note that NLD and PRD should sometimes be different for different phases of development if Phasic Files are being made.

5 Nitrogen

% Nitrogen (N) in the soil is the measure used here because data for %N are relatively easy to obtain. Plant scientists have taken little interest in recent decades in correlations between %N and performance. Therefore rules of thumb have to be used for PlantGro. These are based initially on vigour because growing tissue in all species has much the same N content and hence much the same demand for N per unit of tissue.

6 pH

This is the standard measure of acidity and alkalinity. Most soils fall within the pH range from 3 to 9, but there are exceptions, particularly at the higher end. One pH unit represents a ten-fold change in acidity or alkalinity. pH is used in PlantGro as a summarising indicator which covers the chemical phenomena associated with soil acidity and alkalinity.

7 Phosphorus

Phosphorus is a major nutrient for plant growth, which is often in short supply in acid soils. The measure used here is ppm available, as measured by the Olsen process. PA is pre-set at zero.

8 Potassium

Potassium is a major nutrient for plant growth which has particular influence on translocation of carbohydrate in plants. The measure used here is meq/100 g of soil.

9 Salinity

There are a variety of forms of soil salinity; for example that due mostly to sodium ions and that due mostly to chloride ions. Plants can respond differently to these different forms. PLANTGRO deals with salinity in very general terms, using an estimate based on the units now called dS/m (q.v.). Maas, E. V. (1986) Appl. Agric. Res. 1, p. 12, provides data on salt tolerance for crops and ornamentals. The following units are numerically identical: dS/m, mS/cm, mmhos/cm.

10 Slope

Slope is only considered in relation to the plant falling over or forcing underground organs out through the side of a hill. Access by humans or machinery is not considered. There are three x-axis values for slope: SLA, SLB, and SLC. SLA is preset at zero degrees. For spreading plants such as sweet potato, SLB is likely to be as high as 40, with SLC perhaps 60 or 65.

11 Texture

Texture is considered here solely in relation to the resistance the soil provides to the growth of the plant's underground organs. Effects of texture on water supply and drainage are dealt with elsewhere. For this factor only, the notional relationship format is not used. A suitability rating has to be entered against each of the following texture classes.

12 Daylength-Plant Clock

Daylength can strongly influence a plant's flower development and also sometimes tuber development. PlantGro therefore takes daylength into consideration.

In PlantGro, daylength includes civil twilight because plant processes which respond strongly to daylength are sensitive to quite low levels of light. "Plant clock" reminds users that the focus here is on the plant's view of the effects of daylength. The management view, eg. in relation to bolting in vegetables, can be different. (See the next factor for management view of Daylength).

The options given cover the following types of sensitivity to daylength: (1) neutral, (2) weakly long-day, (3) strongly long-day, (4) strongly short-day and (5) weakly short-day. It can take some time to arrive at a suitable estimate for the daylength relationship because of the interaction with temperature. This interaction is the most sensitive part of PlantGro. The effect is seen in the values reported for Thermal Units (TU's) and Development Units (DU's).

13 Daylength-Management View

This factor is essentially the same as 12 but is included to describe the management's view of daylength instead of the plant's view. Entries here are for guidance and do not affect predictions. Entries can be exactly the same as for the plant view or may contrast if desired.

14 Solar Radiation

This is the solar energy factor and is different from sunshine hours. PlantGro uses mega-joules per square metre per day (MJ/m2/day) as the units of solar radiation. Only about half of this energy is useful for photosynthesis and usually only a small part of that half is trapped by plants. The description and interpretation of solar radiation is complex and many different units have been used in recent years.

15 Brief Cold

Relates to snap cold and is taken to be equivalent to the lowest daily minimum temperature likely in a period. Focus is on the temperature of the plant part considered to be most affected by this factor. The plant part considered here is automatically applied to extended cold as well.

16 Extended Cold

Relates to enduring cold and is taken to be equivalent to the average of the daily minimum temperature over a period. Refer to Brief Cold for more information.

17 Heat Damage

This may be focused either on air temperature or soil temperature for a particular plant part. The indicator for soil temperature is the mean of the maximum + minimum temperatures. The indicator for air temperature is the maximum temperature alone.

18 Thermal Units

These units are calculated from temperature without reference to daylength. They represent parcels of energy which drive the plant's development clock along. Their value can be reduced if the plant is sensitive to daylength and the daylength is unfavourable in a time-period. More familiar terms for TU's are heat units, day-degrees, and growing day-degrees. Calculation of these units is often done by taking the mean of the maximum and minimum temperature and deducting a base temperature. Whilst convenient, this method can produce misleading results if daytime temperatures often exceed the optimum for a plant.

19 Water Availability

This factor compares Actual Evapotranspiration (AET) and Potential Evapotranspiration (PET as a percentage. 100% roughly equates to field capacity; that is the water content of a soil after it has been watered and the large pores have drained. There is also an adjustment factor called PETCF, which is an indication of evaporation from a plant/soil system. (See PETCF and Evaporation in Glossary for further information)

20 Seasonal Waterlogging

This refers to situations where the large soil pores are full of water and oxygen supply to the roots is very poor. This is the water which will freely drain out of the soil if allowed to.

21 Flooding

There is no estimate here for the degree of flooding, only presence or absence of flooding. Presence of flooding is assumed to mean 30 cm depth of water above the soil surface, with the water moving slowly.

22 Wind Damage

The Climate Files record both average and extreme wind speeds. Average wind speed is used in the calculation of frost damage and does not have a corresponding Notional Relationship. For wind damage, extreme wind speed is used. Difficulties in estimating wind damage arise from variations in length of the blast, duration, twisting effects and degrees of protection of the plant. None of these can currently be accounted for within PlantGro, but this factor has been included to remind users not to overlook it. Note that if the Climate File contains no wind data, PlantGro will state that there are no limitations due to wind damage.

23 Quality

Plant Files allow for plant quality to be related to one factor, eg. suitability of a grain for baking or suitability for the taste of a fruit. A relationship which describes the effect of that factor on quality can be entered. Where the effect on quality acts directly through the effect on yield, this provision should not be used.

Climate Files

General Information

Climate Files contain data on climatic conditions for specific locations. The files are based on either actual data or average data, and may refer to twelve monthly, weekly or ten day periods. Each Climate File is placed into a 'data set' according to the type of data it contains. For example, a file that was made for monthly averages would be placed in a different data set from a file holding actual monthly figures.

PlantGro allows users to create their own Climatic Files and to edit existing files in order to customise them. Since the information contained in the Climate File will be compared with information in Plant Files for predicting growth, it is essential to make Climate Files as accurate as possible.

Climate data for 183 locations is provided with the PlantGro program and additional site data is available from various sources. We suggest the following sites as points of departure for securing data as relevant to your location as possible. Be sure to check the format of the data and adjust it accordingly for use within the PlantGro program. You might begin your search for data by visiting the following sites:

ftp://ftp.ncdc.noaa.gov/pub/data/normals/ (These files contain monthly mean precipitation, temperature, and degree days)

http://www.worldclimate.com/ (This site is being updated very soon with more places to be added)

http://www.ncdc.noaa.gov/oa/pub/data/ghcn/v2/ghcnftp.html (Data frm over 20,000 stations, including monthly maximum and minimum temperature as well as mean temperature and precipitation data)

Be warned that many of the data files are very large. A high speed internet connection is advisable as well as a computer with adequate hard drive capacity and high processor speed for manipulating the data.

Climate Data

The data contained within a PlantGro Climate File can be divided between fixed identification data and variable recorded data. The fixed entries include factors such as Longitude, Latitude, Elevation and other identifiers. If several files are required for the same place, eg. for different years of weather, these entries will be the same.

The variable information consists of the entries for twelve climate factors over twelve periods. The twelve climate factors are as follows :

1. Rainfall -   measured in millimetres with no decimal places.

2. Evaporation - measured as for rainfall.

3. Irrigation -   measured as for rainfall.

4. Flooding -   records as 1 or 0 the presence or absence of flooding, not the frequency or size of any flood.

5. Daylength -   records the average daylength in hours to one decimal place. As indicated above, this influences the initiation of plant organs, especially flowering parts. It often interacts strongly with temperature in this respect and is automatically calculated from latitude. Also referred to as Photoperiod.

6. Solar Radiation -   measured in Megajoules per square metre per day with no decimal places. This is a light energy factor. It is different from sunshine hours, which relate mainly to cloud-free hours. Solar radiation is reduced by clouds but passes through them. The average daily value for the time period is used in PlantGro. Example values are:

Mid-summer	dry subtropics	28
Mid-summer	humid subtropics	19
Mid-winter	dry temperate	8
Mid-winter	wet temperate	2

7. Temperature - mean of the Daily Maxima - recorded as degrees Celsius with no decimal places.

8. Temperature -   mean of the Daily Minima - recorded as above.

9. Temperature -   Brief Cold - recorded as above.

10. Wind -   average speed - recorded in kilometres per hour with no decimal places. (See chapter 6 for a guide to estimating wind speed.)

11. Wind -   extreme speed - recorded as above.

12. Humidity -   % Relative Humidity - preferably at 9.00 am. but other times are acceptable.

Data on humidity are not currently used by PlantGro predictions, but should be recorded whenever possible because humidity is likely to be introduced as a factor in the future.

It should be noted that low-growing plants often experience colder temperatures than those recorded in meteorological screens, while taller plants often experience warmer temperatures. The Plant Files therefore contain height indications which are used in the calculation of cold damage. It is therefore recommended that users attempt to use screen temperatures in the Climate Files.

A wrap-around occurs in the monthly average files. This does not occur for the other types of files. It is important to be aware of this special case - with monthly average data, the water balance calculations in January are reconciled with those for December. For obvious reasons, reconciliation is not allowed for the other five types of Climate Files.

Another point to note is the general tendency for the monthly time unit to have a greater averaging effect-upon climate data than the shorter time periods. For short season plants, or to highlight weather variations, files recorded for shorter time periods should be used if possible.

Soil Files

General Information

Soil Files contain data on factors such as nutrients and texture. A number of generalised Soil Files are supplied with PlantGro which may be used as they are for trial purposes or edited to create a new file for a particular soil. Alternatively, a soil file can be made completely from the beginning.

An example of a Soil File from those distributed with PlantGro may be found in Appendix 1. This example file shows the information required for users to create their own Soil Files.

Soil Data

The data contained within a Soil File can be loosely categorised as either identifying information or data on soil factors.

Identifying information includes soil name and site information along with file creation data.

Soil factor entries fall into two sets:

- factors which act directly on plants, such as nitrogen and salinity, and

- factors which act indirectly on plants, such as the soil's water-holding capacity.

Factors in the first group can be compared directly with the plant's view of the world. Factors in the second group have to be manipulated to indicate conditions the plant perceives.

PlantGro recognises three potential layers in the soil profile. The upper two layers can be entered by roots if the texture permits and the plant can root deeply enough. The third layer is concerned solely with drainage.

The soil factor inputs are listed below. Those which refer to a separate soil layer are labelled with the letters A, B, or I. Layer A is the uppermost layer, B the next layer down, and I the infiltration layer. Layer I is the lowest layer for PlantGro purposes.

1.   Aeration

2.   Base Saturation (BS)

3.   Cation Exchange Capacity (CEC)

4.   Depth Overall

5.   Nitrogen

6.   pH

7.   Phosphorus

8.   Potassium

9.   Salinity

10. Slope

11. Depth Layer A, B, and I
     A, B and I are respectively considered to be the depth of the organic layer, the mineral layer and the water infiltration zone, if present. Roots can only penetrate layers A and B. Any two layers can be absent, and roots of some species may not be able to penetrate A or B if the texture is unsuitable.

12. Texture Layer A, B, and I.

13. Available Water Capacity A and B.
     These entries relate to the fine pores in soil which hold water after drainage. This is usually the water plants draw up. Values are expressed as % by volume.

14. Drainable Water Capacity A, B, and I.
     These entries relate to the large pores in soil, which fill up during heavy rain but usually drain quickly thereafter. Values are expressed as % by volume. (For units and further explanation of factors 1 to 10 above, see the "Factors dealt with in the Plant Files" section of this chapter.)

CHAPTER 4 MAKING PREDICTIONS

Introduction

PlantGro has three prediction options. All of them use the same internal prediction engine:

- One-off predictions: for one plant x one soil x one climate.

- Phasic: for processing phases of a plant's development.

- Rotation: for examining possible crop rotations.

Basic Predictions

For the trial run (Chapter 2), potato was used with data for a soil and climate in the Canberra district. Here we again use potato but challenge it with a totally different environment—that of Port Moresby in Papua New Guinea. This way you will see a different output for the same plant. In Figure 25, in Chapter 2, potato was mainly struggling against low temperatures and water stress. Here you will see the consequence of high temperatures and monsoonal rainfall.

The output in Figure 34 is mainly to remind you about the nature of the plant file you chose—who made it, how much you can rely on it, etc. This page also reproduces some of the critical values in the plant file to help you see how some of the results were arrived at.
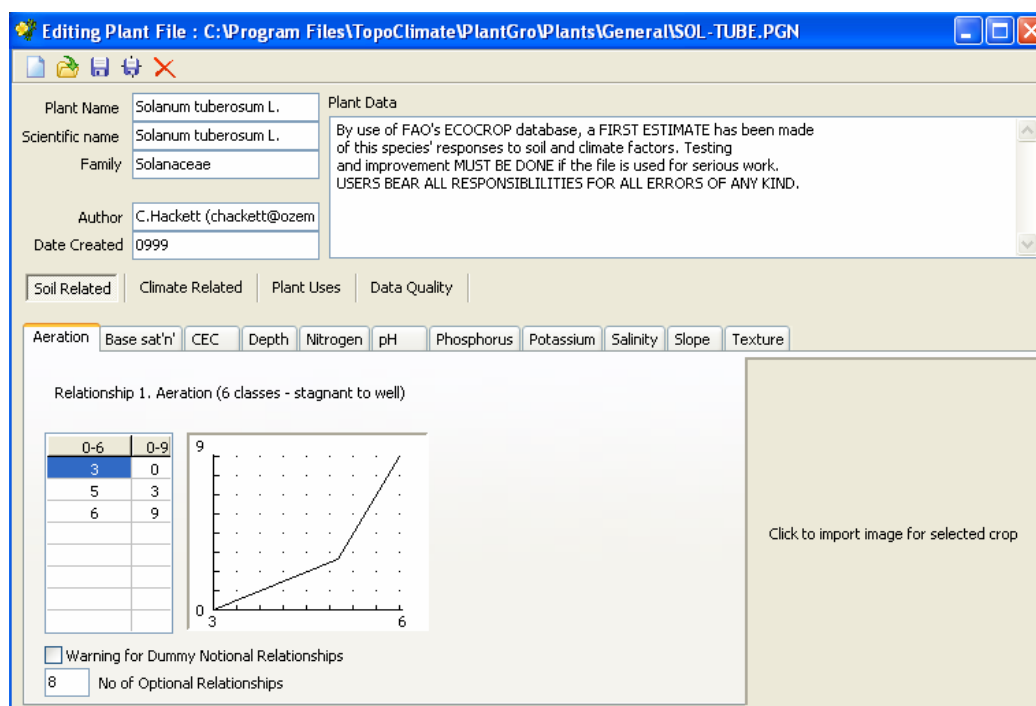
Figure 34: The response of potato to varying soil parameters can be explored in the Plant Edit dialogue box.

Figure 36 deals with the soil inputs and the plant's response to the conditions it perceives. Here, PlantGro first reports the soil description in the soil file and then records the plant's responses as limitation ratings (LR). One needs to click across the range of options

Aeration	Base sat'n'	CEC	Depth	Nitrogen	pH	Phosphorus	Potassium	Salinity	Slope	Texture
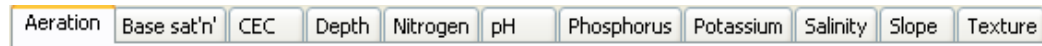
and then change values to see how the crop might respond.

As explained earlier, these ratings are the inverse of the suitability ratings, i.e. they run from 0 to 9 but 0 is now 'no problem' and 9 is 'rapid death'.

This change is made because the prediction system is based on the size of the problems and because the eye expects the largest problem to have the largest rating.

As you will see in Figure 35, potato has few problems with the sandy soil. The greatest LR recorded is for nitrogen and potassium at 4, yet these deficiencies are readily overcome with proper management.

Soil limitation ratings

Aeration	BaseSaturation	CEC	Depth	Nitrogen	pH
4	2	2	0	0	0
Phosphorus	Potassium	Salinity	Slope	Texture	Maximu
1	4	0	0	4	4

Figure 35: Soil limitation factor for Irish Potato in Port Morsby.

Climate limitation ratings

Factor	Start Prd	Jan	Feb	Mar	Apr	N
DaylengthPc		1	1	1	1	1
DaylengthMg		1	1	1	1	1
SolarRadiation		2	2	2	2	3
BriefCold		0	0	0	0	0
ExtendedCold		0	0	0	0	0
HeatDamage		9	9	9	9	9
DevelopmentUnit		5	5	5	4	4
WaterAvailability		0	0	0	0	0
WaterLogging		0	0	0	0	0
Flooding		0	0	0	0	0
WindDamage		0	0	0	0	0
GLR		9	9	9	9	9
OVLR		9	9	9	9	9
SRs		0	0	0	0	0
LGS		99.00	99.00	99.00	99.00	9

Figure 36: A view of some of the climate limitation ratings for Irish Potato in Port Morsby.

Figure 36 depicts some of the climatic limitations for Irish Potato cultivation in Port Morsby. Because Port Moresby is fairly close to the Equator, daylight varies relatively little from month to month. The DayLengthMg (Day Length Managers perspective) for potato, which indicates the influence of daylight on the plant (remember to use the glossary when necessary), remains close to unity because short days are considered favourable for tuber production.

Solar radiation also varies relatively little during the year, and temperatures are virtually constant when viewed as monthly averages.

There are signs of heat problems - too much heat has caused a slowing down of development. In these cases the plant is predicted to go through its development so fast that the organs can't be filled out properly. Yield will be affected. Hence the limitation of 9 being assigned for ***heat damage*** (fatal).

As you can see from ***water availability***, Port Moresby has a very seasonal climate. Mid to late year is dry and the turn of the year very wet. (Remember with soil and climate files - what you see in the file is only an indication. Soils vary from point to point and climates vary from year to year. This variability won't matter too much if you are thinking about your own back yard, but if food supply, income, or soil conservation are dependent on your decision-making, take variability very seriously and use a range of realistic conditions before you reach a firm conclusion.)

Just by looking at these water balance results we can predict that the LR's for water deficit are going to be high in mid-year and that potato may escape problems with waterlogging.

There are no problems due to brief cold and extended cold of course, but the high temperatures have killed potato. The plant file said that 24°C was the threshold soil temperature for tubers, and soil temperature, when estimated as (TMAX + TMIN)/2, is 26°C at Port Moresby.

Daylight was close to 12 hours throughout the year, which is not harmful for tuber development. As expected, more trouble appears when we get to the water-relationships. Without irrigation, potato would yield very poorly in the second half of the year.

Having produced this statement of LR's by relationship and month, PlantGro reports the greatest LR per month (GLR). After that, if the plant file indicates that an annual cycle of development is being considered, it starts the cycle at the beginning of each month and assesses these GLR's up to the point where the cycle is estimated to end.

If the plant is killed during one of these attempts to take the plant through its cycle, LR 9 is recorded. In the Canberra example, some cycles succeeded and some were terminated by low temperatures. Here, all attempts fail and would still fail even if the water balance problems were overcome.

As you can see, this full reporting of the results allows you to do two things. Firstly, you can back-track to see how the results came about. In this process you watch out for inconsistencies or obvious errors—eg. a

faulty relationship in a plant file. You should always go through this process, even if only briefly.

The second thing the printout permits is the asking of management-related questions. Take the example you have just looked at and imagine that you are absolutely determined to grow potatoes at Port Moresby. You would see that you would need a cultivar of potato which is tolerant of high temperatures and you would need fertilisers and irrigation.

In this particular case, of course, many people could reach those conclusions without using PlantGro, but had it been a crop which people were less familiar with, PlantGro could have been very helpful.

Above all, run a variety of plants through the one-off and multiple prediction programs. This will give you more confidence and will help increase your understanding of the output from PlantGro predictions.

Phasic Predictions

As indicated earlier, Phasic Plant Files are contained in a separate directory from General Plant Files. They deal with specific parts of a plant's life cycle. This option is provided because it is common for each phase of development to have distinct environmental requirements. As an example, one set of Phasic files supplied with PlantGro deals with Sweet Potato. For this crop there are three separate files dealing respectively with Cuttings, Tuber Initiation, and Bulking phases. By making predictions with these files in their natural sequence and examining the overall results, a much finer assessment can be made of the suitability of a plant for a site.

Figure 37: Page of the phasic prediction file prepared for printing.

To make a Phasic prediction, choose the option from the prediction menu.
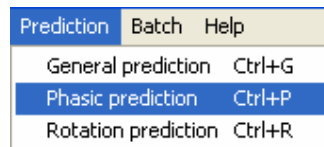
Figure 38: Dialogue box for accessing the phasic prediction tool.

The first screen takes the user directly to the Phasic Plant File dialogue box where all the determinations are make for conducting a phasic assessment of a plant.
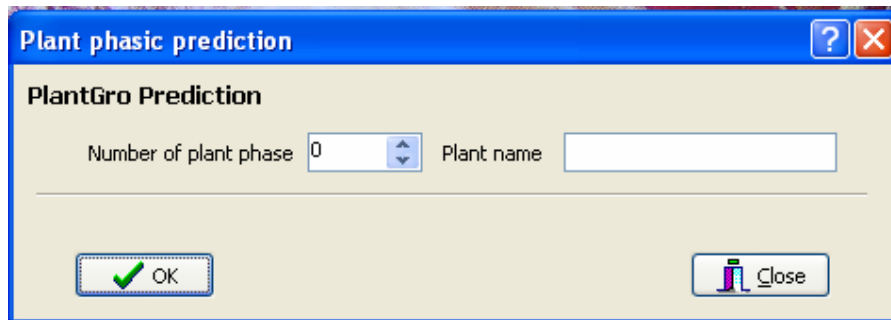
Figure 39: Dialogue box for entering the parameters for a plant phasic prediction.

The first choice to be made is the number of plant phases to be recognised in the computation. In the case here we will use three for the chickpea's three phases of development: vegetative, flowering and podding.

Then choices must be made the climate site and soil site. By entering the choice for one of each of these variables the other corresponding variables will be filled in automatically. Obviously one would not be tearing a plant out after completing one phase of its growth and then transplanting it to a different soil and climatic condition for its second or third phase of development (one obvious exception to this might be rice but typically seedling beds and paddies are close together).

Figure 40: Example of chickpea phasic prediction parameters entered in the dialogue box.

After all the required files are defined click on [✓ OK] and a similar results box to the general prediction exercise will appear. The only difference being that there are three tags to denote the three phases of plant development defined by you the user (circled in red).

Figure 41: Prediction for the three phases of the chickpea development with the icons for each phase highlighted.

The output of a Phasic Plant File prediction can be saved to disk from the detail level. Selecting a File Name is essential as the program will not continue until a valid entry is made in the file name field.

Interpreting Output From a Phasic Prediction

In this section the final output from a Phasic prediction will be explained (Figure 42). The example is based on Sweet Potato experiencing the monthly average climate for Hong Kong and growing in a Sandy Clay soil.
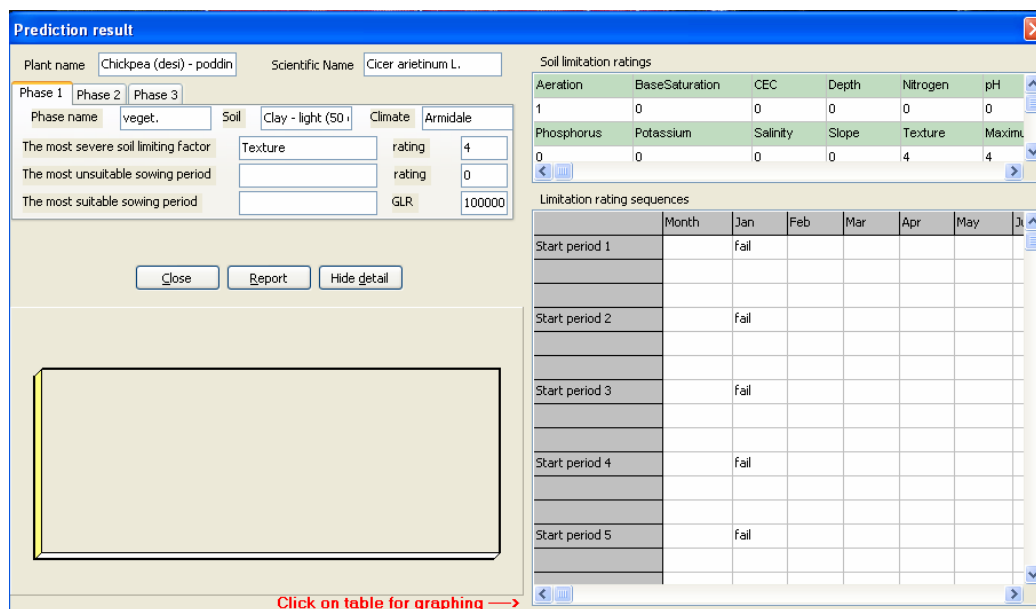
Figure 42: The last page of output from a Phasic prediction
for sweet potato.

It is usually best to begin studying output for a Phasic prediction by viewing the data from the Limitation Rating Sequences at the very end of the printout/file. The second last column in this section shows the overall LR for each of the twelve planting times, which in this case is mostly close to 4. Note that the LGS in the column to the left of LR varies between 4.8 and 7.5 months. This may have practical or economic significance in some cases.

Looking further to the left, there are indications that for plantings from December to February, there is likely to be, on average, an LR 5 or 6 for one of the time periods. From the seasonal pattern of these values it is natural to expect them to relate to seasonal temperatures, but the user should not rely on guesses here.

Figure 42 indicates that there are significant limitations in every month for each time of planting. To see whether these problems can be overcome, the user will have to study the full output to see what the limitations are due to.

Crop Rotations

With this option it is possible to produce predictions for a series of crops following each other in sequence. Theoretically an unlimited number of crops could be compared. We suggest you keep the number reasonable and within the parameters of your study area. Each set will comprise one Plant, one Climate and one Soil file. The output from the prediction process is similar to that for the Phasic Plant files, except that the results for each file are not linked to those for the next file.
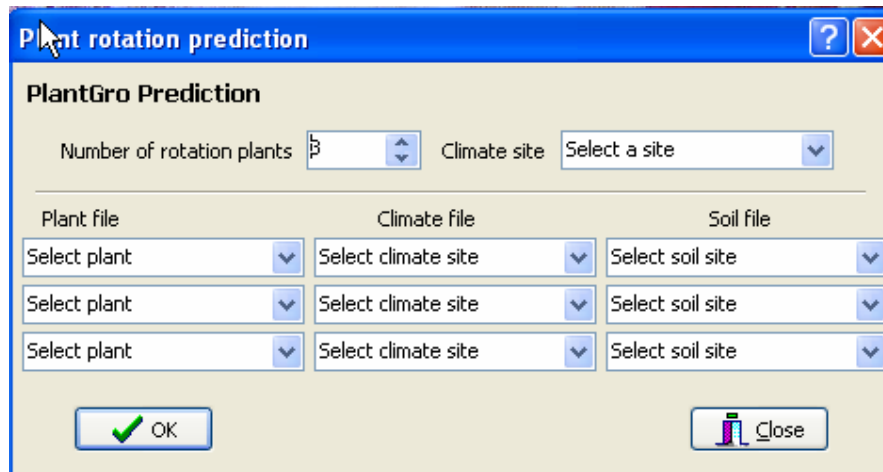
Figure 43: Plant Rotation Prediction dialogue box.
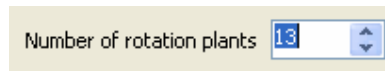
Figure 44: Dialogue box for determining the number of crops to be examined.

Simply type the number of plants to be selected for examination or click on the up and down arrows to increase or decrease the number of plants as displayed in Figure 44.

As mentioned above, both the Climate and Soil files are limited to the number of Plant files selected. The Plant file names are displayed in an individual dialogue box on the main rotation dialogue box. If the user does not match a Climate and/or Soil file to a Plant file, the program will automatically use the last selected file of that type. Alternative soil types can be chosen for each crop in the rotation but alternative climate files can not be selected.

The output of a Rotation prediction can be saved to disk from the Details dialogue box (Figure 47). It is advisable to create a new directory that reflects the project you are engaged in so that subsequent rotation files or other related files can be saved to the same project directory.
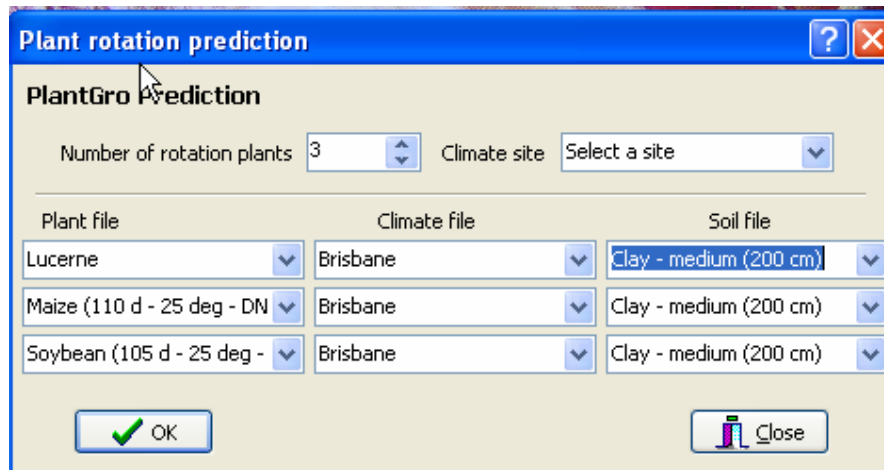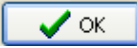
Figure 45: Roration prediction dialogue box with parameters defined.

By clicking on [✓ OK] after defining your plant, climate and soil files for the rotation prediction a summary dialogue box will appear. You can toggle between [Plant 1 | Plant 2 | Plant 3] to see the summary information for each crop in the rotation. Therefore the most severe limiting factor and most unsuitable sowing period for each crop can be easily discerned.
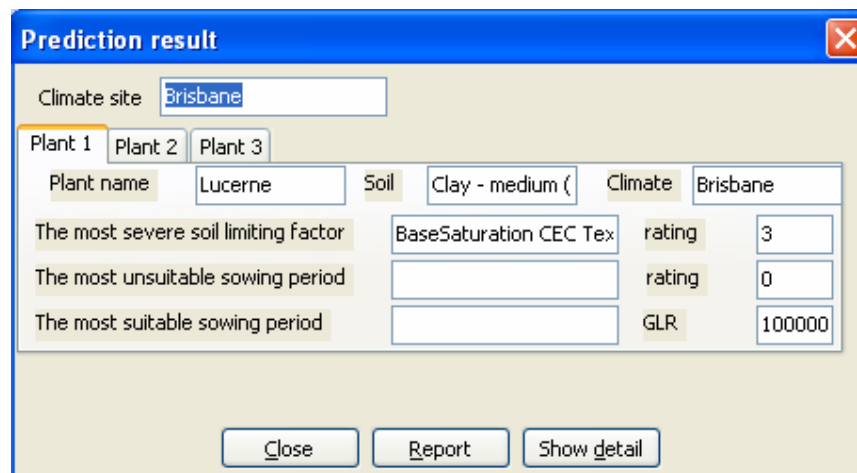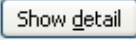
Figure 46: Basic prediction results summary dialogue box for rotation prediction.

By clicking on the [Show detail] icon a more comprehensive list of attributes is displayed in much the same format as with the phasic and general plant predictions. Graphs of individual crops in relation to the other crops in the rotation can be displayed by clicking on the variable in the Limitation rating sequence dialogue box (circled in red below).
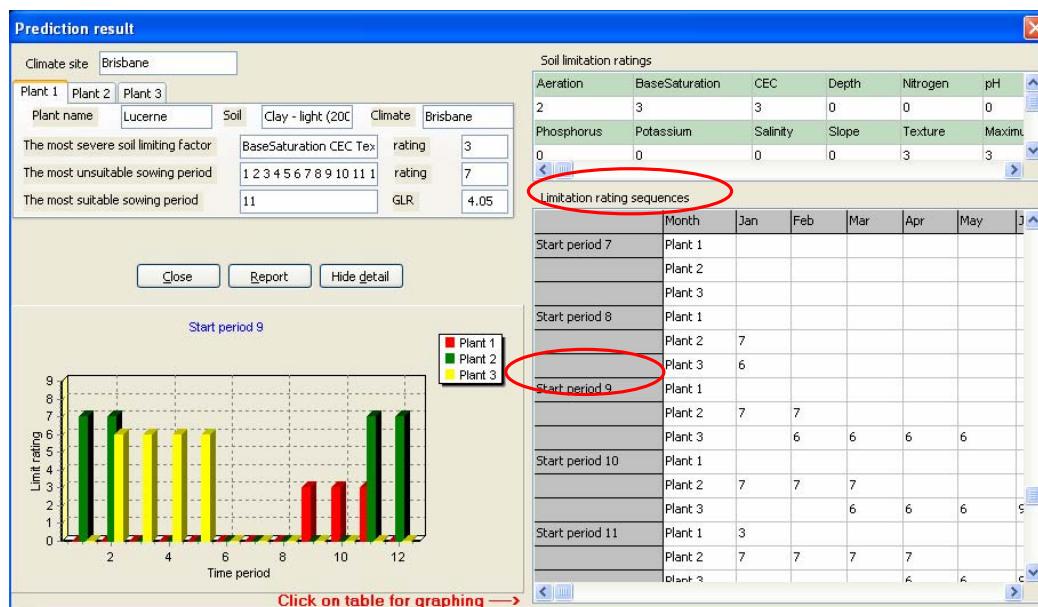
Figure 47: Prediction details for rotation prediction displaying start period 3 from the limitation rating sequence.

By toggling through the crops [Plant 1 | Plant 2 | Plant 3] the factors in the dialogue box for plant name, soil, climate and particularly most severe limiting factor etc. will change as will the figures in the box to the right that displays the soil limitation ratings. This can be very instructive as one crop type faces few limitations with a particular soil type while another may require very careful soil management to succeed.
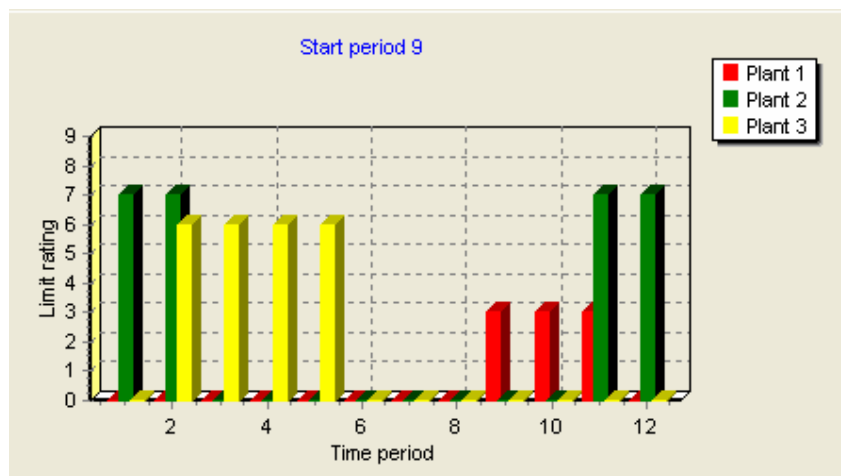
Figure 48: Rotation relationship with a start period of 9 (September) for beginning the planting of lucerne followed by plant 2 (maize) followed by plant 3 (soybean) in Brisbane.

The graphs generated by clicking on a start period (red circles in Figure 47) can also be very instructive. The following graph represents the planting of lucerne (red bars) in September (possible as a green manure for plough down for the planting of maize in November (green bars) followed by the planting of soybeans (yellow bars) in March for harvest in May. Clearly the choice of short season crop varieties would be important

in this scenario. To explore in more detail the important limiting factor for each crop you must run each of the chosen crops through a general or phasic (if the available data will support it) analysis for closer examination. Currently the rotation function only displays the GLR (greatest limitation rating) for each crop within the Limitation rating sequence dialogue box. Without performing the other analysis (general/phasic) you will not be sure if it is soil or a climatic limiting factor which is the greatest limiting factor being displayed in the rotation prediction Limitation rating sequence dialogue box.

Clearly, the choice of plants, their sequence (plant 1, plant 2 or plant 3 etc.) in the rotation cycle and the greatest limitation factors must all be considered when constructing realistic tests of rotation systems. Considerable experimentation will be required to do reasonable/practical assessments. Be sure to save your outputs for future reference as they can help to inform you in the future.

Batch Runs

Users of PlantGro may wish to query several plants against a certain climate and soila nd compare the results. PlantGro supports the analysis of multiple plants, soils and climates through its Batch tool. The tool is designed to interface with Excel spreadsheets holding the data you wish to analyse. This data is then passed through the processing tool of PlantGro. An output is generated that is also supprted by Excel. This permits eas of sorting and further analysis based on indivual user's requirements.

To use the Batch tool, slect it from the tool bar or the drop down menu .
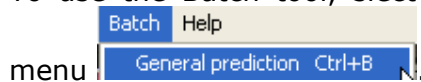
The following dialogue box will be displayed:
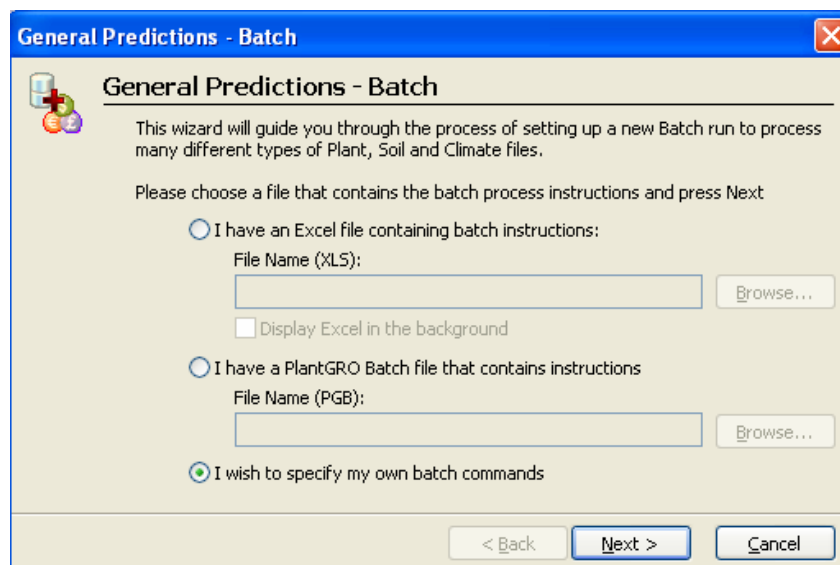
Figure 49: General Prediction – Batch dialogue box and wizard.

For users wishing to conduct batch runs of plants, climates and soils already pre-loaded in PlantGro simply toggle to I wish to specify my own batch commands and click Next > .

When the following dialogue box appears click on Add :
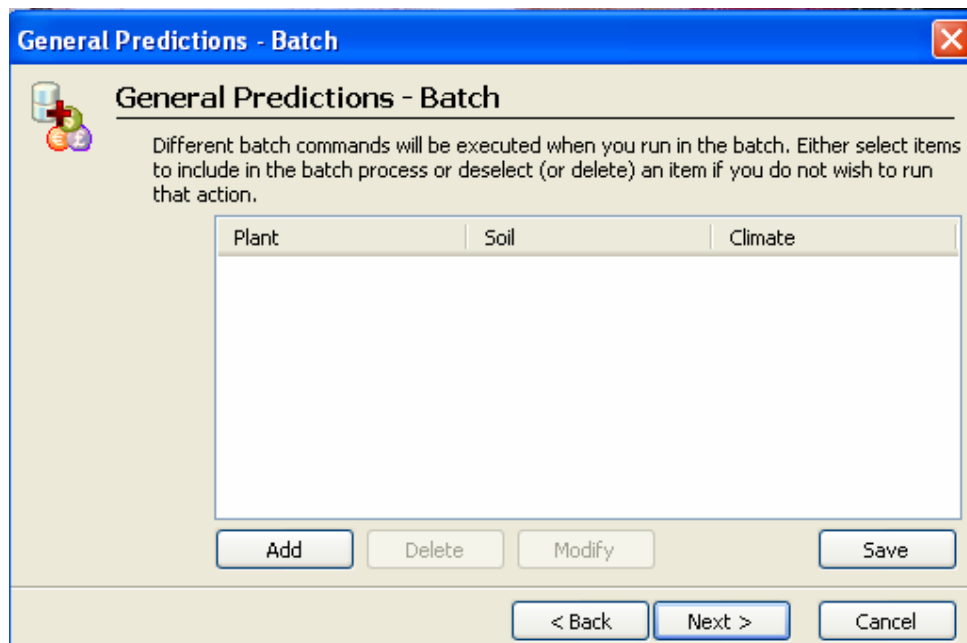
Figure 50: Batch mode selction window.

When you click on Add you have the choice of entering single plants, climates and soils or multiple.
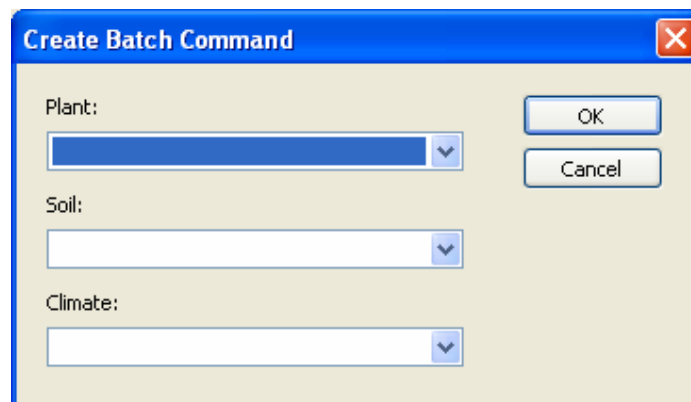
Figure 51: Single entry dialogue box.
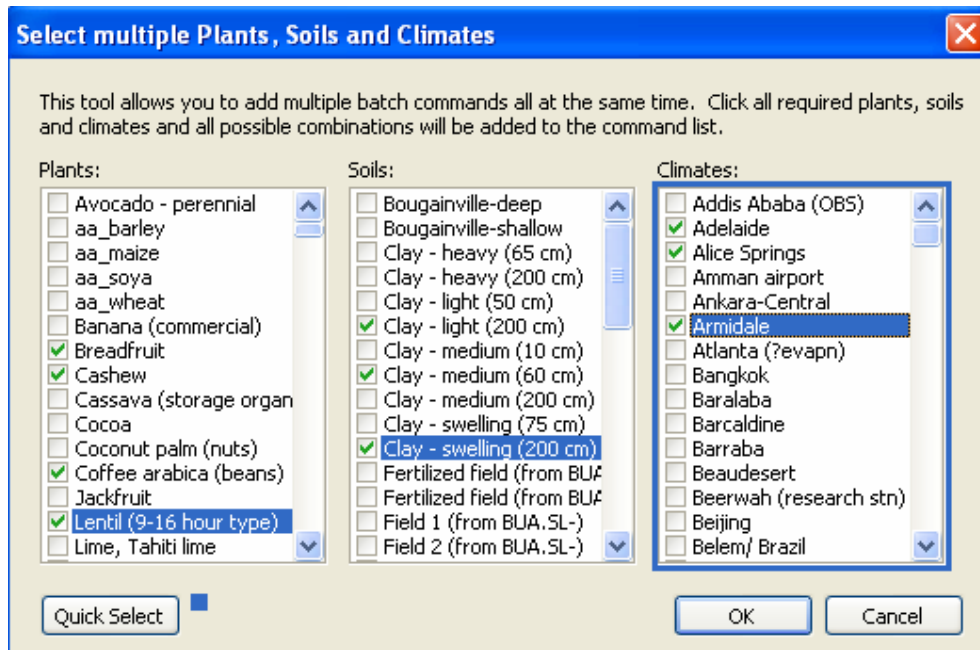
Figure 52: Multiple entry dialogue box.

Simply tick the box of each plant, climate and soil you which to query. Youc an use the [Quick Select] icon to open a more complex selection tool that supports the use of the ctrl and shift keys and mouse button.

After clicking OK the programme consolidates your requested bacth run and presents it in a separate dialogue box which can then be saved for future use or you can proceed to analyse your combinations of plants, cimates and soils. You can edit your selctions as well prior to running the batch.
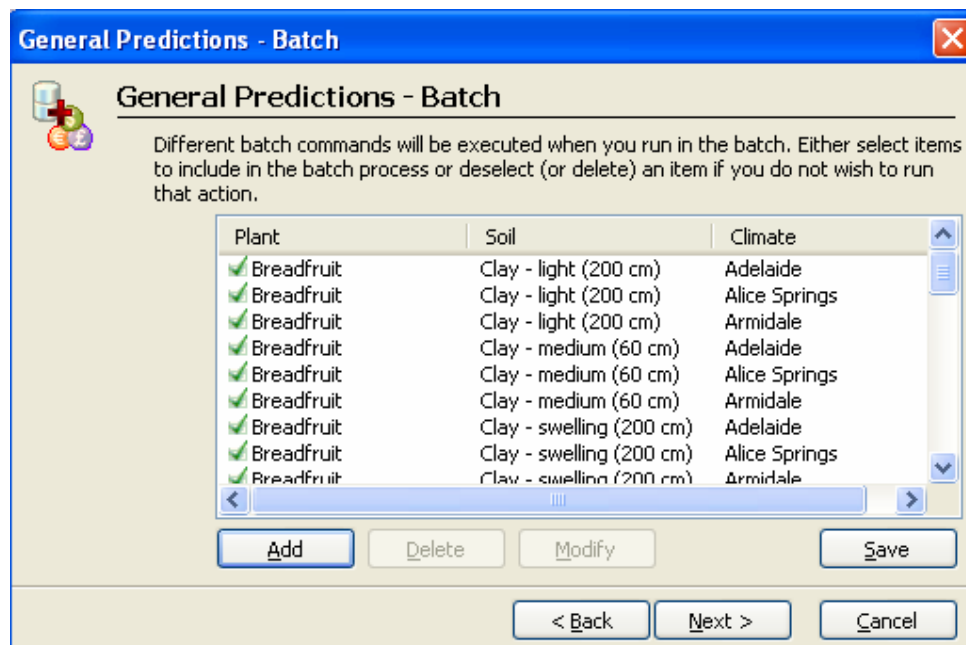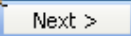
Figure 53: Consolidated batch selection prior to analysis.

When you are prepared to run your bacth you must select a site for the outputs to be filed. Click on the [Next >] icon and select a directory to place your results.
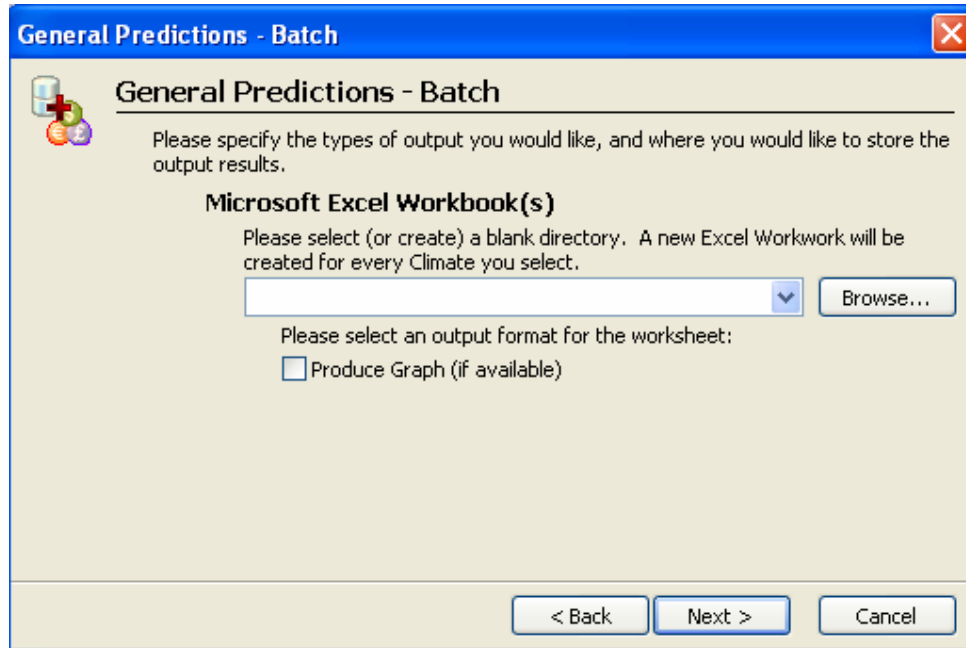
Figure 53: Export Excel outputs to the directory of your choice.

By clicking on next the programme will begin to work through the batch run you have specificed. This could take a considerable amount of time depening on the speed of your computer and the number of plant, climate, and soil combinations you have specified.

You can either view your output in Excel or finish and view it later.
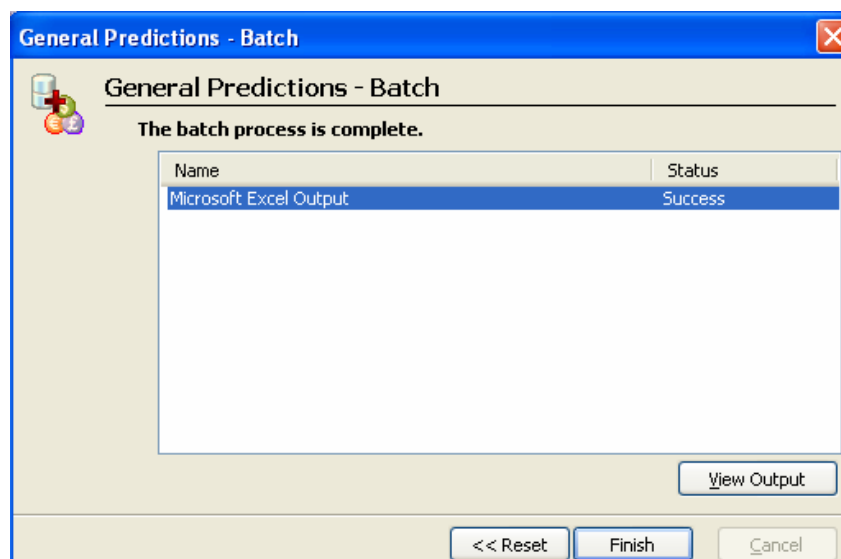
Figure 54: View your output or finish the function.

The other two function within the batch run dialogue box allow you to either specify a custom run of plants, climates and soils or to open a batch run that you had previously done to run it again, or to modify it and run it under those changed conditions.

Figure 55: Alternatives to running batch files from within PlantGro.

For the Batch tool to function you MUST BE SURE THAT YOUR REQUIRED PLANT, SOIL AND CLIMATE FILES ARE ALREADY RESIDENT IN PlantGro. If you have custom files from your own location enter these as you would any other plant, soil and climate file as outlined on pages 5 and 6 of this manual.

Once all your required files are in place you can create an Excel spreadsheet to query the data. The following is an example with the headings required by PlantGroto recognise the files and the formats in which the must be presented in Excel.

A	B	C	D	E
PlantFile	SoilFile	ClimateFile	Plant name	Scientific name
VIG-ANGU.PGN	CL-SW200.SL-	NAMBOUR.CMV	Adzuki bean	Vigna angularis
ELA-GUIN.PGN	CL-SW200.SL-	NAMBOUR.CMV	African oil palm	Elaeis guineensis
ORY-GLAB.PGN	CL-SW200.SL-	NAMBOUR.CMV	African rice	Oryza glaberrima Steud.
SPH-STEN.PGN	janefield.sl-	NAMBOUR.CMV	African yam bean	Sphenostylis stenocarpa
MED-SATI.PGN	janefield.sl-	NAMBOUR.CMV	Alfalfa	Medicago sativa
PRU-AMYG.PGN	janefield.sl-	NAMBOUR.CMV	Almond	Prunus amygdalus
PAN-QUIN.PGN	SA-LO-75.SL-	NAMBOUR.CMV	American ginseng	Panax quinquefolium

Figure 50: Format for Batch run Excel spreadsheet.

If you have already created a bacth run and have saved it you can easily access it by clking on the ⬡ I have a PlantGRO Batch file that contains instructions icon and browing to the file, clicking on it. You can then modify the file or run it again as is.

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(This list includes some relevant
publications not mentioned in the text.)

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APPENDIX 1 PLANT COMMON AND SCIENTIFIC NAMES

Current and Potential PlantGro Plant Files

Listing by Scientific Name

(* Denotes that there is limited data about this plant)

Common Name	Scientific Name
Abaca *	Musa textilis Nee
Abarco *	Cariniaria pyriformis Miers
Abata kola *	Cola acuminata (Beauv.) Sc.
Acacia acradenia *	Acacia acradenia F. Muell.
Acacia ammobia *	Acacia ammobia Macconochie
Acacia anticeps *	Acacia anticeps Tind
Acacia brassii *	Acacia brassii Pedley
Acacia cincinnata *	Acacia cincinnata F. Muell.
Acacia dictyophleba *	Acacia dictyophleba F.Muell
Acacia difficilis *	Acacia difficilis Maiden
Acacia glaucocaesia	Acacia glaucocaesia Domin
Acacia jennerae *	Acacia jennerae Maiden
Acacia jensenii *	Acacia jensenii Maiden
Acacia julifera (gil) *	Acacia julifera Benth.(gil)
Acacia julifera (gil) *	Acacia julifera Benth.(gil)
Acacia laeta *	Acacia laeta R.Br.ex Benth.
Acacia leptocarpa *	Acacia leptocarpa A. Cunn.
Acacia maconochieana *	Acacia maconochieana Pedley
Acacia millifera	Acacia millifera (Vahl)Bent
Acacia pachyacra *	Acacia pachyacra Maiden & B
Acacia parchcarpa *	Acacia parchcarpa F. Muell.
Acacia polystachya *	Acacia polystachya A. Cunn.
Acacia synchronicia *	Acacia synchronicia Maslin
Acai *	Euterpe oleracea Martius
Acanthus *	Acanthus ilicifolius L.
Achnatherum splendens *	Achnatherum splendens (Tr.)
Adzuki bean	Vigna angularis (Willd.) O.
Afara *	Terminalia superba Engl.&D.
African mahogani *	Khaya senegalensis (Desr.)
African oak *	Chlorophora excelsa (Welw.)
African oil palm	Elaeis guineensis Jacq.
African pencil cedar *	Juniperus procera Hochst.
African rice *	Oryza glaberrima Steud.
African star grass *	Cynodon nlemfuensis Vander.
African white wood *	Triplochiton scleroxylon K.
African yam bean *	Sphenostylis stenocarpa (H)
Afrormosia *	Pericopsis elata (Harms) M.
Afzelia africana *	Afzelia africana Smith
Agati *	Sesbania grandiflora (L.)P.
Agropyron mongolicum *	Agropyron mongolicum Keng
Agrostis trinii *	Agrostis trinii Turcz.
Ahipa *	Pachyrrhizus ahipa (Wed.)P.
Ailanthus *	Ailanthus altissima (Mill.)
Aji *	Capsicum chinense Jacq
Akee *	Blighia sapida Koenig
Albizia pullenii *	Albizia pullenii Verdc.
Alder *	Alnus acuminata O. Kuntze
Aleppo clover *	Medicago truncatula Gaertn.

Aleppo pine *	Pinus halepensis Mill.
Alexandrian laurel *	Calophyllum inophyllum L.
Alexandrian senna *	Cassia senna L.
Alfalfa	Medicago sativa L.
Algaroba *	Prosopis pallida H.B.K.
Algarrobo blanco *	Prosopis chilensis (Mol.)
Alkali sacaton *	Sporobolus airoides Torr.
Almond	Prunus amygdalus Batsch.
Alpine ash	Eucalyptus delegatensis R.
Alsike clover	Trifolium hybridum L.
Alyce clover *	Alysicarpus vaginalis L. DC
Amaranth	Amaranthus dubius L.
Amaranthus	Amaranthus spp.
Ambarella	Spondias cytherea Sonn.
American beachgrass *	Ammophilla breviligulata F.
American beech *	Fagus grandifolia
American chestnut *	Castanea dentata Borkh.
American ginseng *	Panax quinquefolium L.
American joint vetch *	Aeschynomene americana L.
American licorice *	Glycyrrhiza lepidota Pursh
American oil palm *	Elaeis oleifera
American pima cotton	Gossypium barbadense L.
Ammi *	Trachyspermum ammi (L.) Sp.
Ampupu	Eucalyptus urophylla S.T.B.
Andaman bow-wood *	Sageraea elliptica Hook. f.
Andaman redwood *	Pterocarpus dalbergioides R
Angleton bluestem	Dichanthium aristatum (Po.)
Anise	Pimpinella anisum L.
Annato *	Bixa orellana L.
Annual bluegrass	Poa annua L.
Annual kyasuwa grass *	Pennisetum pedicellatum Tr.
Antelope grass	Echinochloa pyramidalis (L)
Apple	Malus domestica Borkh.
Apple	Malus sylvestris Mill.
Applemint *	Mentha rotundifolia (L)Huds
Apricot	Prunus armeniaca L.
Apricot, Japanese *	Prunus mume Siebold & Zucc.
Areuy gember *	Fibraurea tinctoria Lour.
Aristida pennata *	Aristida pennata Trin.
Arizona cypress *	Cupressus arizonica Greene
Arjuna *	Terminalia arjuna (Roxb.) W
Arrowhead *	Sagittaria sagittifolia L.
Arrowleaf clover *	Trifolium vesiculosum Savi
Arrowroot *	Maranta arundinacea L.
Arundinella hirta *	Arundinella hirta (Thunb) K
Asam kandis *	Garcinia xanthochymus Hook.
Asiatic mangrove *	Rhizophora mucronata Lam.
Asparagus	Asparagus officinalis L.
Asparagus bean	Vigna unguiculata sesqui. L
Assam tea	Camellia sinensis v assam.
Atemoya	Annona atemoya Hort
Aucher's grass *	Chrysopogon plumulosus Hoch
Australian blackwood	Acacia melanoxylon R. Br.
Australian bluestem *	Bothriochloa bladhii (Ret.)
Avaram *	Cassia auriculata L.
Avocado * (Guatemalan)	Persea americana Mill.
Avocado * (Mexican)	Persea americana Mill.
Avocado * (West Indian)	Persea americana Mill.
Axlewood *	Anogeissus latifolia (Roxb)
Axlewood *	Anogeissus latifolia (Roxb)
Babacu palm *	Orbignya martiana Bard&Rodr
Babacu palm *	Orbignya oleifera Burret

Babul *	Acacia nilotica (L.) Willd.
Bael *	Aegle marmelos Cottea
Bahaman pine *	Pinus caribaea, bahamensis
Bahera *	Terminalia belerica Roxb.
Bahia grass	Paspalum notatum Fluegge
Bahia piassava palm *	Attalea funifera Mart.
Ball clover *	Trifolium nigrescens Viv.
Ballagi *	Poeciloneuron indicum Bedd.
Balsa *	Ochroma pyramidale (Cav.)
Bambara groundnut *	Voandzeia subterranea (L)T.
Bamboo grass *	Arundinaria pusilla A. Che.
Bamboo nutans *	Bambusa nutans Wall.
Banana	Musa acuminata Colla
Banana	Musa acuminata x M. balbis.
Banana *	Musa halabanensis Meijer
Banana *	Musa salaccensis Zoll.
Banana passionfruit	Passiflora mollissima (HBK)
Bangalow palm *	Archontophoenix cunningham.
Bano *	Eragrostis tremula (Lam.) S
Banyan *	Ficus benghalensis L.
Banyonan tembaga *	Microstegium ciliatum (T.)
Baobab *	Adansonia digitata F.Muell
Barbados cherry	Malpighia glabra L.
Barbasco *	Lonchocarpus nicou (Aubl.)
Bard vetch *	Vicia monantha Retz.
Bariala *	Bambusa vulgaris Schrad.
Bari-kai *	Miliusa velutina (Dunal) H.
Barley	Hordeum vulgare L.
Barley mitchell grass *	Astrebla pectinata (Lindl.)
Barnyard millet	Echinochloa crus-galli (L)
Barobans *	Bambusa balcooa Roxb.
Basil *	Ocimum basilicum L.
Basin wildrye *	Elymus cinereus Scrib.&Merr
Bastard mustard *	Cleome gynandra L.
Batai *	Albizia falcataria (L.) Fo.
Batiki blue grass	Ischaemum ciliare Retzius
Bauhinia *	Bauhinia racemosa L.
Baula *	Calophyllum peekelii Laute.
Bay tree *	Pimenta racemosa (Mill.) J.
Bayog *	Dendrocalamus merrillianus
Bean, common	Phaseolus vulgaris L.
Bean, Winged	Psophocarpus tetragonolobus
Beleme *	Xanthosoma brasiliense Engl
Benoil tree	Moringa oleifera Lam.
Benteak *	Lagerstroemia lanceolata W.
Bergamot *	Citrus aurantium v bergamia
Bermuda grass	Cynodon dactylon (L.) Pers.
Betel palm	Areca catechu L.
Betel vine *	Piper betle L.
Bhorsal *	Hymenodictyon excelsum Wall
Bhutan cypress *	Cupressus torulosa Don
Big bluestem *	Andropogon gerardii Vitman
Big trefoil *	Lotus uliginosus Schkuhr
Bignay *	Antidesma bunius (L.) Spre.
Bilimbi *	Averrhoa bilimbi L.
Bilsted *	Liquidambar styaciflua L.
Binuang *	Octomeles sumatrana Miq.
Bira tai *	Garcinia multiflora Champ.
Bird rape	Brassica campestris L.
Birdsfoot trefoil	Lotus corniculatus L.
Birdwood grass	Cenchrus setigerus Vahl
Bitter gourd *	Momordica charantia L.

Bitter potato *	Solanum x juzepczukii
Bitter vetch *	Vicia ervilia (L.) Willd.
Bitter yam	Dioscorea dumetorum (K.) P.
Black bean *	Castanospermum australe Cu.
Black box	Eucalyptus largiflorens F.M
Black cumin *	Nigella sativa L.
Black currant *	Ribes nigrum L.
Black cypress pine *	Callitris endlicheri (Par.)
Black gidgee *	Acacia pruinocarpa Tindale
Black gidyea *	Acacia argyrodendron Domin.
Black kongu *	Hopea utilis (Bedd.) Bole
Black mangrove *	Avicennia germinans (L.) L.
Black medic *	Medicago lupulina L.
Black mulberry	Morus nigra L.
Black mustard *	Brassica nigra L.
Black nightshade *	Solanum nigrum L.
Black oak *	Casuarina cristata Miq. cr.
Black raspberry *	Rubus occidentalis L.
Black sapote	Diospyros digyna Jaxq.
Black saxaul *	Haloxylon aphyllum (Minkw.)
Black sheoak *	Casuarina littoralis Salisb
Black siris *	Albizia odoratissima Benth
Black spear grass	Heteropogon contortus (L.)
Black swamp grass *	Leptochloa fusca (L.) Kunth
Black walnut *	Juglans nigra L.
Black wattle *	Acacia mearnsii De Wild.
Black wattle *	Acacia plectocarpa A. Cunn.
Blackberry *	Rubus spp
Blackbutt *	Eucalyptus pilularis Smith
Blackpod vetch *	Vicia sativa L. s. nigra
Blackwood *	Dalbergia latifolia Roxb.
Bladder saltbush *	Atriplex vesicaria Heward
Blady grass *	Imperata cylindrica (L.) R.
Blessed thistle *	Cnicus benedictus L.
Blinding tree *	Exoecaria agallocha L.
Blue grama *	Bouteloua gracilis (Willd.)
Blue lupin	Lupinus angustifolius L.
Blue mountains ash *	Eucalyptus oreades R. Baker
Blue panic *	Panicum antidotale Retz.
Blue pine *	Pinus excelsa Wall.
Blue wildrye *	Elymus glaucus Buckl.
Bluebunch wheatgrass	Agropyron spicatum (Pursh)
Blue-leav. stringybark*	Eucalyptus agglomerata Mai.
Blue-leaved paperbark *	Melaleuca dealbata S.T.Bla.
Blush tulip oak * (act)	Argyrodendron actinophyllum
Blush tulip oak * (div)	Argyrodendron actinophyllum
Bodalla wattle *	Acacia silvestris Tindale
Boer love grass *	Eragrostis chloromelas Ste.
Boilam *	Anisoptera scaphula (Roxb.)
Boree *	Acacia tephrina Pedley
Borneo teak *	Intsia bijuga (Colebr.)O.K.
Botil *	Phaseolus polyanthus Green.
Bottle gourd *	Lagenaria siceraria (M) St.
Bottle tree *	Adansonia gregorii F.Muell.
Bowstring hemp *	Sansevieria guineensis (L)
Brachiaria dura *	Brachiaria dura Stapf
Brazil cherry *	Eugenia uniflora L.
Brazil nut	Bertholletia excelsa H.& B.
Brazilian cacao *	Theobroma grandiflorum (Sp)
Brazilian fire tree *	Schizolobium parahybum (V.)
Brazilian lucerne	Stylosanthes guianensis gui
Breadfruit	Artocarpus altilis (Park.)

Brewster cassia *	Cassia brewsteri (F.Muell.)
Brigalow *	Acacia harpophylla F.Muell.
Bro.-l. white mahogany*	Eucalyptus umbra ssp carnea
Bro.-l. white mahogany*	Eucalyptus umbra ssp umbra
Broad bean	Vicia faba L.
Broad-leaf paspalum *	Paspalum wettsteinii Hack.
Broad-leaved hickory *	Acacia falciformis DC.
Broad-leaved paperbark*	Melaleuca viridiflora Sol.
Brome grass	Bromus inermis Leyss.
Brown barrel	Eucalyptus fastigata D.& M.
Brown beetle grass *	Diplachne fusca (L.) Beauv.
Brown mallet *	Eucalyptus astringens Maid.
Brown oak *	Quercus semecarpifolia Smi.
Brown pine *	Podocarpus elatus R. Br.
Brown salwood *	Acacia aulacocarpa Cunn.
Browntop millet *	Brachiaria ramosa (L.)Stapf
Brush box *	Tristania conferta R.Br.
Brussels sprouts	Brassica oleracea L.v gemm.
Brutia pine *	Pinus brutia Ten.
Buckthorn *	Frangula alnus Mill.
Budda pea *	Aeschynomene indica L.
Buffalo gourd *	Cucurbita foetidissima HBK
Buffalo grass *	Buchloe dactyloides (Nutt.)
Buffel grass *	Cenchrus ciliaris L.
Buk oak *	Quercus lamellosa Smith
Bulb canarygrass *	Phalaris aquatica L.
Bulbous barley *	Hordeum bulbosum L.
Bulbous bluegrass *	Poa bulbosa L.
Bull mitchell grass *	Astrebla squarrosa C.E.Hubb
Bull oak *	Casuarina luehmannii R.T.B
Bullamon lucerne *	Psoralea patens Lindl.
Bullock's heart	Annona reticulata L.
Bulu rice (Javanica)	Oryza sativa s. javanica
Bungoma grass *	Entolasia imbricata Stapf
Bunut lengis *	Ficus subcordata Blume
Bunya pine *	Araucaria bidwillii Hook.
Buriti palm *	Mauritia flexuosa L.
Burley tobacco	Nicotiana spp
Burma mangrove *	Bruguiera gymnorrhiza (L.)
Burma padauk *	Pterocarpus macrocarpus Ku.
Burmese grape *	Baccaurea ramiflora Lour.
Burmese siris *	Albizia lucida Benth.
Burnet *	Sanguisorba minor
Burr medic *	Medicago polymorpha L.
Burrows wattle *	Acacia burrowii Maiden
Butter-cup tree *	Cochlospermum religiosum L.
Butterfly pea *	Clitoria ternatea L.
Butterfly tree *	Colophospermum mopane (Ki.)
Button mangrove *	Conocarpus erctus L.
Buttonclover *	Medicago orbicularis (L) B.
Cabbage	Brassica oleracea L.v capi.
Cabbage-tree palm	Livistana australis (R. Br.)
Cacao	Theobroma cacao L.
Cacao blanco *	Theobroma bicolor Humb. et
Cadaga	Eucalyptus torelliana F. M.
Caeruleum calopo *	Calopogonium caeruleum B.S.
Caisin *	Brassica rapa L. Gaisin gr.
Calamagrostris epigei.*	Calamagrostis epigeios L.
Calamondin *	Citrofortunella (x) microc.
Calendula *	Calendula officinalis L.
California b. walnut *	Juglans hindsii Jeps.
Calliandra *	Calliandra calothyrsus Mei.

Calopo *	Calopogonium mucunoides Ds.
Calvary medic *	Medicago intertexta (L) Mi.
Camel's foot *	Bauhinia esculenta Burchell
Camphor bush *	Tarchonanthus camphoratus L
Camwood *	Baphia nitida Lodd.
Canada bluegrass *	Poa compressa L.
Canada wildrye *	Elymus canadensis L.
Canary grass *	Phalaris canariensis L.
Canary Island pine *	Pinus canariensis C.Sm.
Candlenut *	Aleurites moluccana (L.) W.
Canihua	Chenopodium pallidicaule H.
Canistel *	Pouteria campechiana (H.B.)
Cantaj *	Pinus tenuifolia Benth.
Cantala fibre *	Agave cantala Roxb.
Cape aloe *	Aloe ferox Miller
Cape York red gum *	Eucalyptus brassiana S.T.B.
Caper *	Capparis spinosa
Caragana intermedia *	Caragana intermedia
Caragana korshinskii *	Caragana korshinskii
Caragana microphylla *	Caragana microphylla Lam.
Carambola	Averrhoa carambola L.
Caraway *	Carum carvi L.
Carbeen *	Eucalyptus tessellaris F.M.
Cardamom *	Elettaria cardamomum L. Ma.
Cardyne vetch *	Vicia villosa Roth. s dasy.
Caroa fibre *	Neoglazovia varigata Mez.
Carob	Ceratonia siliqua L.
Carolina poplar *	Populus deltoides Bartr.
Carpet grass	Axonopus affinis Chase
Carpon desmodium *	Desmodium heterocarpon L.DC
Carribean pine *	Pinus caribaea, caribaea
Carribean stylo	Stylosanthes hamata (L.) T.
Carrot	Daucus carota L.
Cashew	Anacardium occidentale L.
Cassava	Manihot esculenta Crantz.
Castor	Ricinus communis L.
Casuarina campestris *	Casuarina campestris Miq.
Catnip *	Nepeta cataria L.
Cauliflower	Brassica oleracea L.v botr.
Celeriac	Apium graveolens L. v rapac
Celery top pine *	Phyllocladus aspleniifolius
Centipede grass *	Eremochloa ophiuroides (M.)
Centipede grass *	Ischaemum timorense Kunth
Centro *	Centrosema pubescens Benth.
Centrosema *	Centrosema acutifolium Ben.
Centurion *	Centrosema pascuorum Benth.
Ceylon spinach	Basella alba L.
Chakua *	Albizia stipulata Boivin.
Chakwa *	Anogeissus acuminata Wall.
Chamomile *	Anthemis nobilis (L.) All.)
Champ *	Michelia doltsopa Buch. Ha.
Champac *	Michelia champaca L.
Channel millet *	Echinochloa turneriana (D.)
Chaplash *	Artocarpus chaplasha Roxb.
Charcoal tree	Trema orientalis (L.) Blume
Chaulmoogra	Hydnocarpus laurifolia (D.)
Chaulmugra *	Hydnocarpus kurzii (King) W
Chaya *	Cnidoscolus chayamansa McV.
Chebulic myrobalan *	Terminalia chebula Retz.
Cheesewood *	Nauclea orientalis (L.) L.
Chempedak *	Artocarpus integer (Thunb.)
Cherimoya	Annona cherimolia Miller

Cherry, Sour	Prunus cerasus L.
Cherry, Sweet	Prunus avium L.
Chervil *	Anthriscus cerefolium L.
Chewing's red fescue	Festuca rubra L v commutata
Chick pea	Cicer arietinum L.
Chickrassy *	Chukrasia velutina Wt.& Arn
Chicory	Cichorium intybus L.
Chilean strawberry *	Fragaria chiloensis L. Duch
Chilgoza pine *	Pinus gerardiana Wall.
China coral tree *	Erythrina variegata L.
China Jute *	Abutilon theopharasti Medic
China tea	Camellia sinensis v sinens.
Chinaberry *	Melia azedarach L.
Chinese amarath	Amaranthus tricolor L.
Chinese artichoke *	Stachys affinis Bunge
Chinese boxthorn *	Lycium chinense Miller
Chinese cabbage	Brassica chinensis L.
Chinese cassia *	Cinnamomum cassia Presl.
Chinese chestnut *	Castanea mollisima L.
Chinese chives	Allium tuberosum Rottler
Chinese fir *	Cunninghamia lanceolata (L)
Chinese tallow tree *	Sapium sebiferum (L.) Roxb.
Chinese water chestnut*	Eleocharis dulcis Trin.
Chinese yam	Dioscorea opposita Thunb.
Chinquapin *	Castanea pumila
Chir pine *	Pinus roxburghii Sarg.
Chives	Allium schoenoprasum L.
Choyote	Sechium edule (Jacq) Swartz
Christ-thorn *	Zizyphus spina-christi (L.)
Chufa *	Cyperus esculentus L.
Chush-chush yam	Dioscorea trifida L.
Cicer milkvetch *	Astragalus cicer L.
Cinnamon *	Cinnamomum verum Presl.
Citron	Citrus medica L.
Citronella grass *	Cymbopogon nardus (L) v mah
Citrus	Citrus spp
Clary sage *	Salvia sclarea L.
Cleistogenes chinensi.*	Cleistogenes chinensis (M.)
Cleistogenes squarrosa*	Cleistogenes squarrosa (T.)
Clinelymus dahuricus *	Clinelymus dahuricus (Tur.)
Clove *	Eugenia aromatica Kuntze
Cluster bean	Cyamopsis tetragonoloba (L)
Coachwood *	Ceratopetalum apetalum D.D.
Coast grey box *	Eucalyptus bosistoana F.Mu.
Coast sheoak	Casuarina equisetifolia L.
Coca *	Erythroxylum coca Lam.
Cock's comb *	Celosia argentea L.
Cocona *	Solanum hyporhodium A.Br.&B
Coconut	Cocos nucifera L.
Cocoyam	Colocasia esculenta (L.) S.
Coffee arabica	Coffea arabica L.
Coffee excelsa *	Coffea excelsa L.
Coffee liberica	Coffea liberica Bull ex He
Coffee robusta	Coffea canephora Pierre
Coffee senna *	Cassia occidentalis L.
Cogwheel medick *	Medicago turbinata (L.) All
Cohume palm *	Orbignya cohume (Mart.) Da.
Cola-nut, commercial *	Cola nitida (Vert.) Schott
Colchicum *	Colchicum autumnale L.
Collards	Brassica oleracea L.v acep.
Colocynth *	Citrullus colocynthis (L.)
Colonial bentgrass *	Agrostis tenuis Sibth.

Colorado river hemp *	Sesbania exaltata (Raf.) R.
Coloured Guinea grass *	Panicum coloratum L.
Columbus grass	Sorghum x almum Parodi
Common bentgrass	Agrostis gigantea Roth.
Common buckwheat *	Fagopyrum esculentum Moench
Common fig *	Ficus carica L.
Common indigo *	Indigofera tinctoria L.
Common licorice *	Glycyrrhiza glabra L.
Common red ribes *	Ribes sativum
Common reed *	Phragmites australis (Cav.)
Common rue	Ruta graveolens L. v. brac.
Common russet grass *	Loudetia simplex (Nees) C.
Common vetch *	Vicia sativa L. s. sativa
Composita yam *	Dioscorea composita Hemsl.
Cooba *	Acacia salicina Lindl.
Cooktown ironwood *	Erythrophleum chlorostahys
Coolibah	Eucalyptus microtheca F.Mu.
Cori grass *	Brachiaria supquadripara T.
Coriander *	Coriandrum sativum L.
Cork oak	Quercus suber L.
Corkwood *	Duboisia myoporoides R. Ba.
Corkwood wattle *	Acacia bidwillii Benth.
Corn mint *	Mentha arvensis v piperasc.
Cornroot *	Calathea allouia (Aubl.) L.
Cotton, American upland	Gossypium hirsutum L.
Cowpea	Vigna unguiculata unguic. L
Cowslip *	Caltha palustris L.
Crabapple *	Schizomeria ovata D. Don.
Crabapple mangrove *	Sonneratia caseolaris (L.)
Crambe *	Crambe abyssinica (Hochst)
Cranberry	Vaccinium macrocarpon Ait.
Creeping bentgrass *	Agrostis stolonifera L.
Creeping foxtail *	Alopecurus arundinaceus Po.
Creeping vigna *	Vigna parkeri Baker
Crested wattle *	Albizia lophantha (Willd.)
Crested wheatgrass	Agropyron desertorum (Fis.)
Crested wheatgrass Fw.	Agropyron cristatum (L.) G.
Crimson clover *	Trifolium incarnatum L.
Crowfoot grass *	Dactyloctenium aegyptium L.
Crownvetch	Coronilla varia L.
Cucumber	Cucumis sativus L.
Cuddapah Almond *	Buchanania latifolia Roxb.
Cumin	Cuminum cyminum L.
Cupped clover *	Trifolium cherlei L.
Curly mitchell grass *	Astrebla lappacea (Lindl.)
Curryleaf tree	Murraya koenigii (L.) Spre.
Cusso *	Hagenia abyssinica (Bruce)
Custard banana	Asiminia triloba (L.) Dunal
Cut leaf medic *	Medicago laciniata (L) Mil.
Cutch tree *	Acacia cattechu (L.f.) Will
Cypress pine *	Callitris columellaris F.M.
Dallis grass	Paspalum dilatatum Poiret
Dalrymple vigna *	Vigna luteola (Jacq.) Benth
Damar *	Agathis dammara (A.B. Lamb
Damas *	Conocarpus lancifolius Engl
Damson *	Terminalia sericocarpa F.M.
Dandelion *	Taraxacum officinale Weber
Danicha *	Sesbania bispinosa (Jacq.)
Darwin stringybark *	Eucalyptus tetrodonta F.Mu.
Date palm	Phoenix dactylifera L.
Debdaru *	Polyalthia fragrans (Dalz.)
Dent maize	Zea mays v. indentata Sturt

Desert date *	Balanites aegyptiaca (L)Del
Desert gum *	Eucalyptus gongylocarpa Bl.
Desert sheoak	Casuarina decaisneana F.Meu
Desmodium ovalifolium *	Desmodium ovalifolium
Dewberries *	Rubus spp
Deyeuxia angustifolia *	Deyeuxia angustifolia Vick.
Dhaman *	Grewia tiliifolia Vahl.
Dhaura *	Lagerstroemia parviflora R.
Diaz bluestem	Dichanthium annulatum (F.)
Diels' sheoak *	Casuarina dielsiana C.A.Gar
Digitalis *	Digitalis purpurea L.
Dill *	Anethum graveolens L.
Dillenia *	Dillenia aurea Sm.
Dillenia *	Dillenia pentagyna Roxb.
Divi-divi *	Caesalpinia coriaria (Jacq)
Doum palm *	Hyphaene thebaica L.
Drin *	Aristida pungens Desf.
Drooping sheoak	Casuarina stricta Aiton
Drought grass *	Ischaemum muticum L.
Dubi grass *	Urochloa oligotricha (Fig.)
Dudhi *	Wrightia tomentosa Roem.&Sc
Dulia garjan *	Dipterocarpus costatus Gaer
Dundas mahogany	Eucalyptus brockwayi C.Gar.
Durian	Durio zibethinus Murray
Dwarf fan palm *	Chamaerops humilis L.
Dyer's-greenwood *	Genista tinctoria L.
East Indian satinwood *	Chloroxylon swietenia DC.
East Indian walnut *	Albizia lebbeck (L.) Benth.
Eastern elderberry *	Sambucus canadensis L.
Eddoe	Colocasia esculenta v. ant.
Edible canna	Canna edulis Ker-Gawler
Eelgrass	Zostera marina
Eggplant	Solanum melongena L.
Eggplant, African	Solanum macrocarpon L.
Egyptian carissa *	Carissa edulis Vahl.
Egyptian clover *	Trifolium alexandrinum L.
Egyptian rattle pod *	Sesbania sesban (L.)Merrill
Elephant apple *	Dillenia indica L.
Elephant grass	Pennisetum purpureum Schum.
Elephant yam *	Amorphophallus campanulatus
Eleusine africana	Eleusine africana Kennedy-O
Emblic myrobalan *	Phyllanthus emblica L.
Emilia *	Emilia sonchifolia (L.) DC.
Emmer *	Triticum diococcon Schrank
Endive	Cichorium endivia L.
English walnut *	Juglans regia L.
Enset *	Ensete ventricosum (Welw.)
Eragrostis pilosa *	Eragrostis pilosa L. Beauv.
Ergot *	Claviceps purpurea (Fr.)Tul
Esculent birdsfoot tre*	Lotus edulis L.
Esparto *	Stipa tenacissima L.
Euphrates poplar *	Populus euphratica Oliv.
European beachgrass *	Ammophila arenaria (L.)Link
European beech	Fagus sylvatica L.
European chestnut *	Castanea sativa Mill.
European gooseberry	Ribes uva-crispa L.
European hazelnut	Corylus avellana L.
European pennyroyal *	Mentha pulegium L.
European strawberry *	Fragaria vesca L.
European wine grape	Vitis vinifera L.
Euterpe edulis *	Euterpe edulis Mart.
Exotheca *	Exotheca abyssinica (A.R.)

Fagopyrum emarginatum *	Fagopyrum emarginatum
False acacia *	Robinia pseudoacacia L.
False citronella *	Cymbopogon nardus (L) v len
False tamarind *	Desmanthus virgatus (L.) W.
False Weymouth pine *	Pinus pseudostrobus Lindl.
Fat hen *	Chenopodium album L.
Feather finger grass *	Chloris virgata Sw.
Feather grass *	Stipa lagascae Roem.&Schult
Feather grass small-f.*	Stipa parviflora Desf.
Feathertop wire grass *	Aristida latifolia Domin
Feijoa	Feijoa sellowiana O. Berg
Fennel *	Foeniculum vulgare Mill.
Fenugreek	Trigonella foenum-graecum L
Fibra *	Ammandra natalia
Fig-leaved gourd	Cucurbita ficifolia Bouche
Fine stem stylo *	Stylosanthes guianensis int
Fine-veined paperbark *	Melaleuca quinquenervia (C)
Finger millet	Eleusine coracana (L)Gaertn
Fishbean *	Tephrosia vogelii Hook. f.
Fish-tail palm *	Caryota urens L.
Fitzroy wattle *	Acacia ancistrocarpa Maid.
Flamboyant *	Delonix regia (Boj.ex Hook)
Flame tree *	Brachychiton acerifolius F.
Flame-of-the-forest *	Butea monosperma (Lamk) Ta.
Flat-topped vetchling *	Lathyrus cicera L.
Flat-topped yate	Eucalyptus occidentalis En.
Flinders grass *	Iseilema membranaceum (Li.)
Flint maize	Zea mays v. indurata Sturt
Flooded gum	Eucalyptus grandis W. Hill
Fluted pumpkin *	Telfairia occidentalis H.f.
Forest red gum	Eucalyptus tereticornis Sm.
Forest satinash	Eugenia suborbiculare (Be.)
Forest sheoak *	Casuarina torulosa Aiton
Formosa camphor tree *	Cinnamomum camphora (L.) P.
Fourwing saltbush *	Atriplex canescens (Pursh.)
Fox grape *	Vitis labrusca L.
French lavender *	Lavandula dentata
Futui	Jacaranda copaia (Aubl.) D.
Gaboon *	Aucoumea klaineana Pierre
Galleta grass *	Hilaria jamesii (Torr.) Be.
Gamba grass	Andropogon gayanus Kunth
Gambier *	Uncaria gambir (Hunter) Ro.
Garden angelica	Angelica archangelica L.
Garden beet	Beta vulgaris L. v crassa
Garden cress *	Lepidium sativum L.
Garden oarch *	Atriplex hortensis L.
Garden rhubarb *	Rheum rhaponticum L.
Garden rocket *	Eruca sativa Miller
Garden strawberry	Fragaria x ananassa (D.) G.
Gardner saltbush *	Atriplex gardneri
Garland chrysanthemum *	Chrysanthemum coronarium L.
Garlic	Allium sativum L.
Gendeli poma *	Garuga pinnata Roxb.
Genipa	Genipa americana L.
German camomile *	Matricaria recutita L.
Ghost gum *	Eucalyptus papuana F. Muell
Giant bamboo *	Dendrocalamus asper (Schu.)
Giant button grass *	Dactyloctenium giganteum L.
Giant granadilla	Passiflora quadrangularis L
Giant hazelnut	Corylus maxima
Giant hopbush *	Dodonaea viscosa Jacq.
Giant hopbush *	Dodonaea viscosa ssp angus.

Giant taro *	Alocasia macrorrhiza (L) S
Giant wildrye *	Elymus condensatus Presl.
Gidgee *	Acacia cambagei R.T. Baker
Gimlet *	Eucalyptus salubris F.Muell
Ginger	Zingiber officinale Rosc.
Gippsland blue gum	Eucalyptus globulus pseudo.
Globe artichoke	Cynara scolymus L.
Goat chili *	Capsicum pubescens Ru.& Pa.
Gokul *	Ailanthus grandis Prain
Golden passionfruit	Passiflora edulis v flavic.
Golden timothy *	Setaria sphacelata 'Kazun.'
Golden timothy *	Setaria sphacelata 'Nandi'
Golden timothy *	Setaria sphacelata 'Narok'
Golden wattle	Acacia pycnantha Benth.
Goldenberry	Physalis peruviana L. v ed
Goldfields medic *	Medicago minima (L.) Bart.
Goose grass *	Eleusine indica (L.) G. in.
Goran *	Ceriops decandra (Griff.)
Governors plum	Flacourtia indica (Burm.f.)
Gracilaria *	Gracilaria tenuistipitata
Gracilaria *	Gracilaria verrucosa
Grapefruit	Citrus paradisi Macfad.Hook
Grass pea *	Lathyrus sativus L.
Greater galanga *	Alpinia galanga (L.) Willd.
Greater yam	Dioscorea alata L.
Grecian foxglove *	Digitalis lanata Ehrh.
Green dammar tree *	Shorea tumbuggaia Roxb.
Green oak *	Quercus dilatata Lindl.
Green panic *	Panicum maximum Jacq. v tr.
Green wattle	Acacia decurrens Willd.
Green wattle *	Acacia irrorata Sieb. ex S.
Greenleaf desmodium	Desmodium intortum (Mill) U
Grenar wheatgrass *	Agropyron intermedium Host
Grey box *	Eucalyptus moluccana Roxb.
Grey Corkwood	Erythrina vespertilio Benth
Grey gum *	Eucalyptus punctata DC.
Grey ironbark	Eucalyptus paniculata Smith
Grey love grass *	Eragrostis cilianensis (A.)
Grey mangrove *	Avicennia marina (Forsk.) V
Grey myall *	Acacia calcicola Forde&Isi.
Grey oak *	Quercus incana Roxb.
Grey satinash *	Eugenia gustavioides Bailey
Groundnut	Arachis hypogaea L.
Grumichama *	Eugenia dombeyi (S.) Skeels
Guacima *	Guazuma ulmifolia Lam.
Guarana *	Paullinia cupana H.B.K.
Guatemala grass *	Tripsacum andersonii J.R.G.
Guava	Psidium guajava L.
Guava, Costa Rican *	Psidium friedrichsthalianum
Guava, Strawberry *	Psidium cattleianum Sabine
Guayule *	Parthenium argentatum Gray
Guettafia *	Atriplex glauca L.
Guinea grass	Panicum maximum Jacq.
Gum arabic tree *	Acacia senegal (L.) Willd.
Gum tragacanth *	Astragalus gummifer Labill.
Gum-barked Coolibah	Eucalyptus intertexta R.Ba.
Gumbo limbo *	Bursera simaruba Sarg.
Gurjan *	Dipterocarpus indicus Bedd.
Gurjan *	Dipterocarpus turbinatus G.
Gutta percha *	Palaquium gutta (Hook)Burck
Gympie messmate	Eucalyptus cloeziana F.Mue.
Habana oat grass *	Themeda quadrivalis (L.) K.

Hairy gooseberry *	Ribes hirtellum
Hairy indigo *	Indigofera hirsuta L.
Hairy-leafed apitong *	Dipterocarpus alatus Roxb.
Haldu *	Adina cordifolia Hook. f.
Halls Creek wattle *	Acacia cowleana Tate
Hard fescue *	Festuca longifolia Thuill.
Hardwickia *	Hardwickia binata Roxb.
Haskaneit *	Cenchrus biflorus Roxb.
Hastate-leaved p.weed *	Monochoria hastata (L.) S.
Hausa groundnut *	Kerstingiella geocarpa Har.
Hausa poptato *	Solenostemon rotundifolius
Heartnut *	Juglans sieboldiana
Heathlands wattle *	Acacia simsii A. Cunn ex B.
Heathlands wattle *	Acacia simsii A. Cunn ex B.
Hemarthria japonica *	Hemarthria japonica Stapf
Hemp	Cannabis sativa L.
Henequen *	Agave fourcroydes Lemaire
Henna *	Lawsonia inermis L.
Hetero *	Desmodium heterophyllum W.D
Hierochloe odorata *	Hierochloe odorata L.Beauv.
Highbush blueberry	Vaccinium corymbosum L.
Highland cress *	Nasturtium schlechteri O.E
Hill toon *	Toona serrata (Roxb.) M.Ro.
Himalayan cedar *	Cedrus deodara Loudon
Himalayan holly *	Ilex dipyrena Wall.
Hoary basil *	Ocimum americanum L.
Hog plum *	Spondias mombin L.
Hollong *	Dipterocarpus macrocarpus V
Holm oak *	Quercus ilex L.
Honduran pine *	Pinus caribaea, hondurensis
Honey-locust	Gleditsia triacanthos L.
Hong Kong wild kumquat*	Fortunella hindsii (C.) Sw.
Hoop mitchell grass *	Astrebla elymoides F. Muell
Hoop pine *	Araucaria cunninghamii Ait.
Hop clover *	Trifolium agrarium L.
Hops	Humulus lupulus L.
Hordeum brevisubulatum*	Hordeum brevisubulatum (T.)
Horehound *	Marrubium vulgare L.
Horse bean tree *	Parkinsonia aculeata L.
Horse bush *	Dendrolobium umbellatum L.
Horse gram	Macrotyloma uniflorum (Lam)
Horseradish	Armoracia rusticana P.Gaer.
Hot pepper	Capsicum frutescens L.
Huisache *	Acacia farnesiana (L) Willd
Hungarian vetch *	Vicia pannonica Crantz
Hungry rice *	Digitaria exilis (Kippist)
Huon pine *	Dacrydium franklinii Hook.f
Hyacinth bean	Lablab purpureus Medik.
Hybrid lavender *	Lavandula intermedia Emeri.
Ice-cream bean *	Inga edulis von Martius
Idaho fescue *	Festuca idahoensis Elmer
Idigbo *	Terminalia ivorensis A.Chev
Ilama *	Annona diversifolia Saff.
Imperial *	Axonopus scoparius (Flugge)
Inca wheat	Amaranthus caudatus L.
India rubber fig *	Ficus elastica Roxb.
Indian almond *	Terminalia catappa L.
Indian beech *	Derris indica (Lam.) Bennet
Indian borage *	Coleus amboinicus Lour.
Indian cane	Saccharum barberi Jesweit
Indian horse chestnut *	Aesculus indica Griff.
Indian jujube	Ziziphus mauritianus Lamk.

Indian laburnum *	Cassia fistula L.
Indian lettuce *	Lactuca indica L.
Indian melilot *	Melilotus indica (L.) All.
Indian mulberry *	Morinda citrifolia L.
Indian olibanum tree *	Boswellia serrata Roxb.
Indian olive *	Olea cuspidata Wall.
Indian red wood *	Soymida febrifuga A. Juss.
Indian sandalwood *	Santalum album L.
Indianfig *	Opunita ficus-indica (L.) M
Indonesian cassia *	Cinnamomum burmannii (C.G)
Inland grey box *	Eucalyptus microcarpa (Ma.)
Intip-intip *	Gelidiella acerosa (Forss.)
Ipecac *	Cephaelis ipecacuanha (St.)
Ironwood of burma *	Xylia dolabriformis Benth.
Irrara *	Acacia macdonnelliensis Ma.
Istle *	Agave lecheguilla Torrey
Itabo *	Yucca elephantipes Regel.
Italian millet *	Setaria italica (L.) Beauv.
Italien ryegrass	Lolium multiflorum Lam.
Jaboticabas *	Myrciaria cauliflora (Mart)
Jacaranda *	Jacaranda mimosifolia D.Don
Jack bean	Canavalia ensiformis (L) DC
Jackfruit	Artocarpus heterophyllus L.
Jamaica cherry *	Muntingia calabura L.
Jamba *	Xylia xylocarpa Roxb.
Jand	Prosopis cineraria (L.) Dr.
Jand *	Prosopis spicigera L.
Janeiro *	Eriochloa punctata (L) Desv
Japanese alder	Alnus japonica (Thunb.) St.
Japanese cane	Saccharum sinense Roxb.
Japanese chestnut *	Castanea crenata Si. & Zu.
Japanese clover *	Lespedeza striata (Thunb.)
Japanese millet *	Echinochloa frumentacea (R)
Jaragua grass *	Hyparrhenia rufa (Ness) St.
Jarrah *	Eucalyptus marginata Donn
Jarul *	Lagerstroemia flos-reginae
Jauari *	Astrocaryum jauari
Java apple *	Eugenia javanica Lamk.
Java devil pepper *	Rauwolfia serpentina Benth.
Java plum	Eugenia cumini (L.) Druce
Java-almond *	Canarium indicum L.
Jemara *	Casuarina junghuhniana Miq.
Jengkol *	Archidendron jiringa (Jack)
Jerusalem artichoke *	Helianthus tuberosus L.
Jew's ear *	Auricularia spp.
Job`s tears	Coix lacryma-jobi L.
Johnson grass *	Sorghum halepense (L.) Pers
Joint vetch *	Aeschynomene falcata (P.)DC
Jojoba	Simmondsia chinensis Link.
Jungle rice *	Echinochloa colona (L) Link
Kadam *	Anthocephalus chinensis Lam
Kaem *	Stephegyne parvifolia Korth
Kaghsi bans *	Dendrocalamus Hamiltonii N.
Kaimi clover	Desmodium incanum (Sw) DC
Kainsal *	Acer caesium Wall.
Kaki *	Diospyros kaki L.f.
Kalia *	Oxytenanthera nigrociliata
Kamachile *	Pithecellobium dulce (Rox.)
Kang kong	Ipomoea aquatica For. aqua.
Kangaroo grass *	Themeda australis (R.Br.) S
Kapok	Ceiba pentandra (L.) Gaertn
Kapundung *	Baccaurea recamosa (Reinw.)

Karai *	Albizia chinensis (Osb.) M.
Karanda *	Carissa carandas L.
Karaya gum *	Sterculia urens Roxb.
Kardhai *	Anogeissus pendula Edgew.
Karikut-ritkut *	Desmodium gyroides (Roxb.)
Karri *	Eucalyptus diversicolor F.M
Karuka *	Pandanus julianettii Martel
Kat illipi *	Bassia latifolia Roxb.
Katembilla	Dovyalis hebecarpa Warb.
Kauri *	Agathis australis (D. Don)
Kauri pine *	Agathis macrophylla (Lindl)
Kauri pine *	Agathis microstachya Bailey
Kauri pine *	Agathis robusta (Moore) Ba.
Kava *	Piper methysticum Forst.
Kei-apple *	Dovyalis caffra (Hook.f.&H)
Kenaf	Hibiscus cannabinus L.
Kennedy ruzi grass *	Brachiaria ruziziensis G&E
Kenya white clover *	Trifolium semipilosum Fres.
Keora *	Sonneratia apetala Ham.
Ketekete *	Campnosperma brevipetiolata
Khang *	Dendrocalamus longispathus
Khasya pine *	Pinus kesiya Royle ex Gord.
Kidney vetch *	Anthyllis vulneraria L.
Kikuyu grass	Pennisetum clandestinum H.
Kindal *	Terminalia paniculata Roth.
King William pine *	Athrotaxis selaginoides Don
Kinkeliba *	Combretum micranthum G. Don
Kino tree *	Pterocarpus marsupium Roxb.
Kiri *	Paulownia tomentosa Steud.
Kirpa *	Lumnitzera racemosa Willd.
Kiwifruit *	Actinidia chinensis Planch.
Klinkii pine *	Araucaria hunsteinii K.Sch.
Kodo millet *	Paspalum scrobiculatum L.
Koeleria cristata *	Koeleria cristata Griseb.
Kohlrabi	Brassica oleracea L.v gong.
Korarima *	Aframomum corrorima (Braun)
Korean clover *	Lespedeza stipulacea Maxim.
Koronivia grass *	Brachiaria humidicola (R) S
Kudzu *	Pueraria lobata (Willd.) O.
Kulsi *	Aegiceras corniculatum Bla.
Kura clover *	Trifolium ambiguum Bieb.
Kurjan seed *	Myrsine africana L.
Kurrajong *	Brachychiton populneus (S.)
Kurrel	Capparis decidua (Forsk.)
Kwako *	Terminalia calamansanai R.
Kyathaungwa *	Bambusa polymorpha Munro.
Lac tree *	Shorea talura Roxb.
Lac-tree *	Schleichera oleosa (Lour.)
Lanceleaf crotalaria *	Crotalaria lanceolata E.Mey
Lancewood *	Acacia shirleyi Maiden
Langsat	Lansium domesticum Corr.
Large hop clover *	Trifolium campestre Schreb.
Large-fr. red mahogany	Eucalyptus pellita F. Muell
Large-leaved mahogany *	Swietenia macrophylla King
Latzs wattle *	Acacia latzii Maslin.
Laurel *	Cordia alliodora (Ruiz&Pa.)
Laurelleaved clitoria *	Clitoria laurifolia Poir.
Leaf mustard	Brassica juncea (L.) Czern.
Leatherwood *	Eucryphia lucida (Labill.)
Leek	Allium ampeloprasum L.v p.
Lehmann love grass	Eragrostis lehmanniana Nees
Lemon	Citrus limon (L.) Burm. f.

Lemon sented iron gum	Eucalyptus citriodora Hook.
Lengua de vaca *	Rumex obtusifolius L.
Lentil	Lens culinaris Medikus
Lesser galanga *	Alpinia officinarum Hance
Lesser yam	Dioscorea esculenta (L.) B.
Letek *	Calamus erinaceus (Becc.) D
Lettuce	Lactuca sativa L.
Leucaena	Leucaena leucocephala (La.)
Leucaena diversifolia *	Leucaena diversifolia Benth
Levant cotton	Gossypium herbaceum L.
Leza *	Lagerstroemia tomentosa Pr.
Lilly pilly *	Acmena smithii (Poiret) Me.
Lima bean	Phaseolus lunatus L.
Lime	Citrus aurantifolia (Chri.)
Limpo grass *	Hemarthria altissima (Poi.)
Liniment tree *	Melaleuca symphyocarpa F.M.
Linseed	Linum usitatissimum L.
Little millet *	Panicum sumatrense Roth ex
Liverseed grass *	Urochloa panicoides Beauv.
Livid amaranth *	Amaranthus lividus L.
Livingstone potato *	Plectranthus esculentus N.E
Loblolly pine *	Pinus taeda L.
Locust bean tree *	Parkia biglobosa (Jacq.) B.
Longan	Dimocarpus longan Lour long
Long-fruited bloodwood*	Eucalyptus polycarpa F.Muel
Long-fruited Jute	Corchorus olitorius L.
Longleaf pine *	Pinus palustris Mill.
Long-leaved paperbark *	Melaleuca leucadendron L.
Looking-glass tree *	Heritiera littoralis Aiton
Loquat	Eriobotrya japonica Lindley
Lotononis *	Lotononis bainesii Baker
Lovage *	Levisticum officinale Koch
Love grass *	Chrysopogon aciculatus (R.)
Lowbush blueberry	Vaccinium angustifolium Ait
Lucuma	Pouteria lucuma
Lumnitzera	Lumnitzera littorea (Jack)
Lupinus pilosus *	Lupinus pilosus
Luzerne escargot *	Medicago tornata (L) Mill.
Lychee	Litchi chinensis Sonn.
Maca *	Lepidium meyenii Walpers
Macademia nut	Macademia integrifolia M&B.
Macademia nut *	Macadamia tetraphylla
Machuri *	Iseilema laxum Hack.
Maharukh *	Ailanthus excelsa Roxb.
Mahoe *	Hibiscus tiliaceus L.
Maiden's gum	Eucalyptus globulus maiden.
Maidens wattle *	Acacia maidenii F. Muell.
Maize	Zea mays L. s. mays
Makai *	Shorea assamica Dyer.
Makarikari grass *	Panicum coloratum L. v mak.
Malabalatong *	Flemingia macrophylla Blum.
Malabar ebony *	Diospyros malabarica (Desr)
Malabar lemongrass *	Cymbopogon flexuosus (Nees)
Malabar neem wood *	Melia compostia Willd.
Malabar nut *	Adhatoda vasica (L.) Ness.
Malay padauk *	Pterocarpus indicus Willd.
Male bamboo *	Dendrocalamus strictus Nees
Mallee pine *	Callitris preissii Miq. ver
Mammey apple	Mammea americana L.
Mandarin	Citrus reticulata Blanco x
Mandarin	Citrus reticulata Blanco x
Mangium *	Acacia mangium Willd.

Mango	Mangifera indica L.
Mangosteen	Garcinia mangostana L.
Manila grass *	Zoysia matrella (L) Merrill
Manna gum	Eucalyptus viminalis Labill
Maple silkwood *	Flindersia pimenteliana F.M
Maritime pine *	Pinus pinaster Aiton (Port)
Marri *	Eucalyptus calophylla R.Br.
Masai love grass	Eragrostis superba Peyr.
Mascarey *	Hieronyma chocoensis Cuatr.
Masuku *	Uapaca kirkiana Muell.-Arg.
Mata kucing *	Dimocarpus longan Lour male
Mate *	Ilex paraguaiensis A. St-H.
Mauka *	Mirabillis expansa Ruiz & P
Mauritius hemp *	Furcraea gigantea v. wille.
Mayflower *	Tabebuia rosea (Bertol.)DC.
Meadow fescue	Festuca pratensis Huds.
Meadow foxtail	Alopecurus pratensis L.
Meadow oat grass *	Arrhenatherum elatius (L.)
Mediterranea mandarin	Citrus deliciosa Ten.
Mediterranean sal *	Atriplex halimus L.
Melegueta-pepper *	Aframomum melegueta (Ros.)
Melocalamus *	Melocalamus compactiflorus
Melocanna *	Melocanna baccifera (Roxb.)
Melon pear	Solanum muricatum Ait.
Melville Is. bloodwood*	Eucalyptus nesophila Blakel
Mesquite *	Prosopis juliflora (Sw.)DC.
Messmate tree	Eucalyptus obliqua L'Herit.
Mesua *	Mesua ferrea L.
Mexican apple *	Casimiroa edulis La Llave
Mexican cypress *	Cupressus lusitanica Mill.
Mexican grass *	Ixophorus unisetus (Presl)
Mexican white pine *	Pinus ayacahuite Ehrenb.
Michoacan pine *	Pinus michoacana Martinez
Milanje grass *	Digitaria milanjiana (R.)S.
Mile-a-minute *	Mikania cordata (B.) B.L.R.
Millet, common	Panicum miliaceum L.
Mindanao gum	Eucalyptus deglupta Blume
Minni Ritchi *	Acacia trachycarpa E. Prit.
Miracle-fruit *	Thaumatococcus daniellii B.
Mission grass *	Pennisetum polystachion (L)
Mocochtaj *	Pinus michoacana v cornuta
Mocochtaj *	Pinus psedostrobus v oaxac.
Molasses grass	Melinis minutiflora Beauv.
Molave *	Vitex parviflora A. Juss.
Monkey jack *	Artocarpus lakoocha Roxb.
Monstera	Monstera deliciosa Liebm.
Monterey cypress *	Cupressus macrocarpa Hartw.
Montezuma pine *	Pinus montezumae Lamb.
Moonah *	Melaleuca lanceolata Otto
Moreton Bay fig *	Ficus macrophylla Desf.
Morula *	Sclerocarya caffra Sond.
Moth bean	Vigna aconitifolia (Jacq.)
Mother of cocoa *	Gliricidia sepium (Jacq.) K
Mountain ash	Eucalyptus regnans F.Muell.
Mountain brome	Bromus carinatus Hook.&Arn.
Mountain bromegrass *	Bromus marginatus Nees.
Mountain gum	Eucalyptus dalrympleana Ma.
Mountain papaya *	Carica pubescens Lenne & K.
Mountain rye *	Secale montanum Guss.
Mountain soursop *	Annona montana Macfad.
Mountain yapunyah *	Eucalyptus thozetiana F.Mu.
Mulga *	Acacia aneura F. Muell.

Mundu *	Garcinia dulcis (Roxb) Kurz
Mung Bean	Vigna radiata (L.) Wilczek
Mu-oil-tree *	Aleurites montana (Lour.)
Murray pine *	Callitris preissii Miq. mur
Muscadine grape *	Vitis rotundifolia Michx.
Mushroom, cultivated	Agaricus bisporus
Musizi *	Maesopsis eminii Engl.
Musk melon	Cucumis melo L.
Mutton bluegrass *	Poa fendleriana (Steud.) V.
Myall *	Acacia pendula A. Cunn.
Myrtle *	Myrtus communis L.
Myrtle *	Nothofagus cunninghamii (H)
Nadi blue grass *	Dichanthium caricosum (L.)
Namnam *	Cynometra cauliflora L.
Nandu wood *	Pericopsis mooniana Thwait.
Naranjilla	Solanum quitoense Lamarck
Narbonne vetch *	Vicia narbonensis L.
Narrow-l. peppermint *	Eucalyptus radiata ssp. rad
Narrowleaf trefoil *	Lotus tenuis Wald. & Kit.
Narrow-leaved ironbark	Eucalyptus crebra F. Muell.
Natal indigo *	Indigofera arrecta Hochst.
Natal-palm *	Carissa macrocarpa (Eckl.)
Needlebark stringybark*	Eucalyptus planchoniana F.
Needler grass *	Stipa barbata Desf.
Neem *	Azadirachta indica A. Juss.
Negrohead beech *	Nothofagus moorei (F.Muell)
Neofabricia myrtifolia*	Neofabricia myrtifolia (G.)
Neohouzeaua *	Neohouzeaua dullooa (Gram.)
Nepalese alder *	Alnus nepalensis D. Don
Nettle tree *	Celtris australis L.
New Guinea kauri *	Agathis labillardieri Warb.
New Zealand flax *	Phormium tenax Forst.
New Zealand spinach *	Tetragonia tetragonioides P
Nibong *	Oncosperma tigillarium (J.)
Nicotine tobacco	Nicotiana rustica L.
Niger seed (Ethiopian)	Guizotia abyssinica Cass.
Nigerian stylo *	Stylosanthes erecta Beauv.
Niger-seed (Indian)	Guizotia abyssinica Cass.
Nile grass	Acroceras macrum Stapf
Nipa palm	Nypa fruticans Wurmb.
Nissi *	Aristida ciliata Desf.
Nonda-tree *	Parinari nonda F. Muell.
Northern silky oak *	Cardwellia sublimis F.Muell
Northern wattle *	Acacia crassicarpa A.Cunn.
Nothern white gum *	Eucalyptus brevifolia F.Mu.
Nussi *	Aristida raddiana Savi.
Nutgrass, Purple *	Cyperus rotundus L.
Nutmeg	Myristica fragrans Houtt.
Nutwood *	Terminalia arostrata Ewart
Nyiri batu *	Xylocarpus moluccensis (L.)
Oats	Avena sativa L.
Oca *	Oxalis tuberosa Molina
Ochrus vetch *	Lathyrus ochrus (L.) D.C.
Ocote *	Pinus hartwegii Lindl.
Ocote *	Pinus michoacana F. tumida
Ocote *	Pinus rudis Endl.
Ocote *	Pinus teocote Schl. & Cham.
Ocote de carretilla *	Pinus oocarpa v ochoterenai
Oenanthe *	Oenanthe javanica (Bl.) DC.
Oil-bean tree *	Pentaclethra macrophylla B.
Okra, lady fingers	Abelmoschus esculentus (L.)
Old man saltbush *	Atriplex nummularia Lindl.

Oleander wattle *	Acacia neriifolia Cunn.
Olive, Europaen	Olea europaea L.
Onion	Allium cepa L. v cepa
Onobrychis scrobiculata	Onobrychis scrobiculata Bo.
Opepe *	Nauclea diderrichii (De W.)
Opium poppy	Papaver somniferum L.
Orange wattle	Acacia saligna (Labill) H.
Orchard grass Mediter.*	Dactylis glomerata hispani.
Oregano *	Origanum vulgare L.
Oriental tobacco *	Nicotiana spp
Oval kumquat *	Fortunella margarita (L) S.
Oval-leaved pondweed *	Monochoria vaginalis (N.L.)
Ovok *	Cleistopholis glauca Pierre
Oyster nut *	Telfairia pendata (S.ex S.)
Pacay *	Inga feuillei de Candolle
Pacaya *	Chamaedorea spp
Padal *	Sterospermum suaveolens DC.
Pak choi	Brassica rapa L. Pak Choi
Palmiche *	Euterpe chaunostachys Burr.
Palmyra palm *	Borassus flabellifer L.
Panama hat palm *	Carludovica palmata Ruiz
Panama rubber *	Castilla elastica Cerv.
Pangola grass	Digitaria eriantha Steudel
Panisaj *	Terminalia myriocarpa Heur.
Papaya	Carica papaya L.
Papita *	Sterculia campanulata Wall
Para grass	Brachiaria mutica (For.) St
Parana pine *	Araucaria angustifolia Ber.
Parsley	Petroselinum crispum Mill.
Parsnip	Pastinaca sativa L.
Pasang batu *	Quercus lineata Blume
Pataua *	Jessenia bataua (Mart.) Bu.
Patchouli *	Pogostemon cablin (Blanco)
Patula pine *	Pinus patula Schiede & Dep.
Pea	Pisum sativum L.
Peach	Prunus persica (L.) Batsch
Peach palm	Bactris gasipaes H.B.K.
Pear	Pyrus communis L.
Pearl millet	Pennisetum glaucum (L)R.Br.
Pecan nut	Carya illinoensis Wangenh.
Pepper grass *	Panicum whitei J.B. Black
Pepper tree *	Schinus molle L.
Pepper, black or white	Piper nigrum L.
Peppermint	Mentha x piperita L.
Perennial horse gram	Macrotyloma axillare (E.M.)
Perennial Indian hemp *	Abroma augustum (L.) L.f.
Perennial reygrass	Lolium perenne L.
Perennial soybean	Glycine wightii Arn.
Periwinkle	Catharanthus roseus (L.) G.
Persian clover *	Trifolium resupinatum L.
Persian insect flower *	Chrysanthemum coccineum W.
Persimmon *	Diospyros virginiana L.
Peru balsam *	Myroxylon balsamum v perei.
Peruvian carrot *	Arracacia xanthorrhiza Ban.
Phalsa *	Grewia asiatica L.
Phasey bean	Macroptilium lathyroides L.
Philippine lime *	Citrus madurensis Lour.
Phragmites communis *	Phragmites communis (L.) T.
Pigeon Pea	Cajanus cajan (L.) Mill ssp
Pilang *	Acacia leucophloea (Roxb.)
Pili nut *	Canarium ovatum Engl.
Pimentchien *	Capsicum baccatum L.v pend.

Pimento *	Pimenta dioica (L.) Merr.
Pinabete *	Pinus strobus v. chiapensis
Pindan wattle *	Acacia tumida F. Muell ex B
Pineapple	Ananas comosus (L) Merr.
Pink bloodwood *	Eucalyptus intermedia R.Ba.
Pinle on *	Xylocarpus granatum König
Pinto peanut *	Arachis pintoi Krap.& Greg.
Pinus ayachuite *	Pinus ayachuite Ehrenb v Br
Pinus chiapensis	Pinus chiapensis (Martinez)
Pinus douglasiana *	Pinus douglasiana Martinez
Pinus durangensis *	Pinus durangensis Martinez
Pinus greggii *	Pinus greggii Engelm.
Pinus oocarpa *	Pinus oocarpa Schiede
Pinus sylvestris v mon*	Pinus sylvestris v mongoli.
Pinus tabulaeformis *	Pinus tabulaeformis Carr.
Pistachio nut *	Pistacia vera L.
Pita fibre *	Acehmea magdalenae Andre
Pitali *	Trewia nudiflora L
Pitpit *	Saccharum edule Hassk.
Pit-pit *	Phragmites karka (Retz.) St
Plantain bananas	Musa balbisiana Colla
Plate bush *	Solanum torvum Swartz
Plicatulum *	Paspalum plicatulum Michaux
Plicatulum glabrum *	Paspalum plicatulum M.v gl.
Plum	Prunus domestica L.
Plum, Japanese *	Prunus salicina Lindley
Pochote *	Bombacopsis quinata (Jacq.)
Pod maize	Zea mays v. tunicata Sturt
Pomegranate *	Punica granatum L.
Pomerac	Eugenia malaccensis L.
Ponderosa pine *	Pinus ponderosa Dougl.
Poon *	Calophyllum apetalum Willd.
Poonspar tree *	Calophyllum elatum Bedd.
Pop maize	Zea mays v. everta Sturt
Poplar box *	Eucalyptus populnea F.Muell
Populus simonii *	Populus simonii
Poshte *	Annona scleroderma Saff.
Pot marjoram *	Origanum creticum L.
Potato	Solanum tuberosum L.
Potato bean *	Pachyrrhizus tuberosus (L.)
Potato yam	Dioscorea bulbifera L.
Powderbark wandoo *	Eucalyptus accedens W.Fitzg
Pretty birdsfoot trefo*	Lotus halophilus Boiss.
Prickly wattle *	Acacia victoriae Benth.
Primavera *	Cybistax donnellsmithii (R)
Primavera *	Roseodendron donn.-smithii
Princess feather *	Amaranthus hypochondriacus
Prosopis velutina *	Prosopis velutina Wooton
Puccinellia tenuiflora*	Puccinellia tenuiflora (S.)
Pulasan *	Nephelium mutabile Bl.
Pummelo	Citrus maxima (Burm.) Merr.
Pumpkin	Cucurbita moschata (Duch.)
Purple passionfruit *	Passiflora edulis v edulis
Purple raspberry *	Rubus occidentalis x idaeus
Purple vetch *	Vicia benghalensis L.
Purslane *	Portulaca oleracea L.
Purslane, Single-flow.	Portulaca quadrifida L.
Pussur *	Xylocarpus mekongensis Pie.
Pyrethrum	Chrysanthemum cinerariaefo.
Qat	Catha edulis (Vahl) Endl.
Quail bush *	Atriplex lentiformis (Tor.)
Quandong *	Santalum acuminatum

Quarkgrass *	Agropyron repens (L.)Beauv.
Queensl. silver wattle*	Acacia podalyriifolia A. C.
Queensland maple *	Flindersia brayleyana F.Mu.
Queensland peppermint *	Eucalyptus exserta F. Muell
Queensland silver ash *	Flindersia bourjotiana F.M.
Queensland stringybark*	Eucalyptus nigra R. Baker
Queensland walnut *	Endiandra palmerstonii (B.)
Quince *	Cydonia oblonga Mill.
Quinine	Cinchona officinalis L.
Quinine (calisaya)	Cinchona calisaya Wedd.
Quinine tree *	Petalostigma pubescens Dom.
Quinoa	Chenopodium quinoa Willden.
Rabbitfoot clover *	Trifolium arvense L.
Radiata pine *	Pinus radiata D. Don.
Radish, Chinese *	Raphanus sativus L. (C.R.)
Radish, Leaf *	Raphanus sativus L. (L.R.)
Radish, Rat-tailed *	Raphanus sativus L. (R.R.)
Radish, Western	Raphanus sativus L. (S.R.)
Raintree *	Samanea saman Merrill
Rakkyo	Allium chinense G. Don
Rakum palm *	Salacca wallichiana C. Mar.
Rambai *	Baccaurea motleyana (Muel.)
Rambutan	Nephelium lappaceum L.
Ramie *	Boehmeria nivea (L.) Gaud.
Rampion *	Campanula rapunculus L.
Ranphannas *	Artocarpus hirsuta Lam.
Rasamala *	Altingia excelsa Norona
Rasberry jam *	Acacia acuminata Benth.
Rat's tail grass	Sehima nervosum (Willd.) S.
Rattan *	Calamus peregrinus
Red alder *	Alnus rubra Bong.
Red ash *	Alphityonia excelsa (Fren.)
Red bloodwood *	Eucalyptus gummifera (Sol.)
Red box *	Eucalyptus polyanthemos Sc.
Red carabeen *	Geissois benthamiana F.Muel
Red cedar *	Cedrela toona Roxb.
Red cedar *	Toona australis (F. Muell.)
Red clover	Trifolium pratense L.
Red currant *	Ribes rubrum
Red Fescue	Festuca rubra L. v. rubra
Red ironbark (siderox.)	Eucalyptus sideroxylon Cun.
Red ironbark (tricarp)	Eucalyptus sideroxylon Cun.
Red ironbark (tricarp)	Eucalyptus sideroxylon Cun.
Red mahogany	Eucalyptus resinifera Smith
Red mallee *	Eucalyptus socialis F. Mue.
Red mangrove *	Rhizophora mangle L.
Red mombin	Spondias purpurea L.
Red mulberry *	Morus rubra L.
Red oat *	Avena byzantina K. Koch
Red oat grass *	Themeda triandra Forsk.
Red quinine	Cinchona pubescens Vahl
Red raspberry	Rubus idaeus L.
Red sandalwood *	Pterocarpus santalinus L.f.
Red silk cotton tree	Bombax ceiba L.
Red siris *	Albizia toona Bailey
Red tingle *	Eucalyptus jacksonii Maiden
Red tulip oak *	Argyrodendron peralatum Ba.
Red wattle *	Acacia flavescens A.Cunn.
Redwood *	Eucalyptus transcontiental.
Reed canarygrass	Phalaris arundinacea L.
Resak bukit *	Cotylelobium lanceolatum C.
Resak durian *	Cotylelobium burckii (Heim)

Resak hitam *	Cotylelobium melanoxylon H.
Rescue grass *	Bromus unioloides Kunth
Rhizoma peanut *	Arachis glabrata Benth.
Rhodes grass	Chloris gayana Kunth
Rhynchosia *	Rhynchosia minima (L.) DC
Rice bean *	Vigna umbellata (Thunb.)
Rice paddy (Japonica)	Oryza sativa L. s. japonica
Rice upland (Indica)	Oryza sativa L. s. indica
Rice upland (Japonica)	Oryza sativa L. s. japonica
Rice, paddy (Indica)	Oryza sativa L. s. indica
Ricegrass *	Oryzopsis holciformis (M.B)
Ridged gourd *	Luffa acutangula (L.) Roxb.
Rigid ryegrass *	Lolium rigidum Gaud.
Ringworm bush *	Cassia alata L.
Ritha *	Sapindus emarginatus Vahl.
River cooba *	Acacia stenophylla A. Cunn.
River peppermint *	Eucalyptus elata Dehnh.
River red gum (NP)	Eucalyptus camaldulensis NP
River red gum (SP)	Eucalyptus camaldulensis NP
River sheoak	Casuarina cunninghamiana M.
River tea-tree *	Melaleuca bracteata F.Muel.
Rock sheoak *	Casuarina huegeliana Miq.
Rooikrans *	Acacia cyclops A. Cunn.
Rose clover *	Trifolium hirtum All.
Rose maple *	Cryptocarya erythroxylon M.
Rose wattle *	Acacia fasciculifera F.Mue.
Rose-apple	Eugenia jambos L.
Roselle (altissima)	Hibiscus sabdariffa L.v al.
Roselle (sabdariffe)	Hibiscus sabdariffa L.v sa.
Rosemary	Rosmarinus officinalis L.
Rosewood *	Dysoxylum fraseranum (A.J.)
Rosewood *	Terminalia volucris R. Br.
Rosha grass v. motia *	Cymbopogon martini (R.) mo.
Rosha grass v. sofia *	Cymbopogon martinii (R.) so.
Rotan sega *	Calamus caesius Blume
Rottnes Island pine *	Callitris preissii Miq. pre
Rough bluegrass *	Poa trivialis L.
Rough pea *	Lathyrus hirsutus L.
Rough-barked apple *	Angophora floribunda (Smi.)
Round kumquat *	Fortunella japonica (T.) S.
Roundleaf cassia *	Cassia rotundifolia Persoon
Rubber *	Hevea brasiliensis (Willd.)
Rubberhedge euphorbia *	Euphorbia tirucalli L.
Rumbut bunga putih *	Asystasia gangetica (L.)T.A
Rumex crispus *	Rumex crispus L.
Rumput melayu *	Ischaemum magnum Rendle
Rungia	Rungia klossii S. Moore
Russian brome grass *	Bromus tomentellus Boiss.
Russian olive *	Elaeagnus angustifolia L.
Rutabaga *	Brassica napus L. Napobras.
Rye	Secale cereale L.
Sabi grass	Urochloa mosambicensis (H.)
Sacred lotus	Nelumbo nucifera Gaertn.
Safflower	Carthamus tinctoius L.
Saffron *	Crocus sativus L.
Sage *	Salvia officinalis L.
Sago palm	Metroxylon sagu Rottboell
Saigon cassia *	Cinnamomum loureirii Nees
Sain *	Terminalia tomentosa W.& A.
Sainfoin *	Onobrychis viciifolia Scop.
Sal *	Shorea robusta Gaertn. f.
Salak palm *	Salacca zalacca (Gaertner)

Salix flavida *	Salix flavida Chang & Skv.
Salmon gum	Eucalyptus salmonophloia F.
Salsify *	Tragopogon porrifolius L.
Salt river mallett	Eucalyptus sargentii Maiden
Salt wattle *	Acacia ampliceps B.R.Maslin
Salt-water couch *	Paspalum distichum L.
Samama *	Anthocephalus macrophyllus
Sand bluestem *	Andropogon hallii Hack.
Sand love grass *	Eragrostis trichodes
Sand pear *	Pyrus pyrifolia (Burm. f.)
Sand plain lupin	Lupinus cosentinii Guss.
Sandalwood	Santalum spicatum (R.Br)DC.
Sandhill wattle *	Acacia ligulata A. Cunn.
Sandplain wattle *	Acacia murrayana F. Muell
Sapodilla	Manilkara achras (Mill) Fos
Sapote *	Pouteria sapota (Jacq) H.M.
Sappanwood *	Caesalpinia sappan L.
Sassafras *	Doryphora sassafras Endl.
Satinay *	Syncarpia hillii Bailey.
Satsuma mandarin *	Citrus unshiu Marcovitch
Sauce americano *	Salix babylonica L.v.sacra.
Scarlet gum *	Eucalyptus phoenicea F.Muel
Scarlet poppy *	Papaver bracteatum Lindl.
Scarlet runner bean	Phaseolus coccineus L.
Scots pine *	Pinus sylvestris L.
Sea buckthorn *	Hippophae rhamnoides L.
Sea buckthorn *	Hippophae salicifolia D. D.
Seagrape *	Coccoloba uvifera (L.) L.
Seakale *	Crambe maritima L.
Semul *	Bombax insigne Wall.
Senegal rosewood *	Pterocarpus erinaceus Poir.
Sensitive plant *	Mimosa pudica L.
Seragoon grass *	Digitaria didactyla Willd.
Sericea *	Lespedeza cuneata (Dum) G.
Serradella *	Ornithopus roseus Dufour
Sesame seed	Sesamum indicum L.
Sesbania cannabia *	Sesbania cannabia (Retz.) P
Sesbania macrantha *	Sesbania macrantha v levis
Sesbania macrantha *	Sesbania macrantha v macra.
Sesbania pachycarpa *	Sesbania pachycarpa
Sewan grass *	Lasiurus hirsutus Boiss.
Seymour grass	Bothriochloa pertusa (L.) C
Shadscale *	Atriplex confertifolia (T.)
Shafshoof ain seela *	Aristida lanata Forssk.
Shallot	Allium cepa L. v aggregatum
Sharp-crapped mallee *	Eucalyptus oxymitra Blakely
Shea butter tree *	Butyrospermum paradoxum (G)
Sheep fescue *	Festuca ovina L.
Shengali *	Carallia lucida Roxb.
Shingle tree *	Acrocarpus fraxinifolius W.
Shining gum	Eucalyptus nitens (De & Ma)
Shirohie millet *	Echinochloa utilis Ohwi-Ya.
Shittim wood *	Acacia seyal Del.
Showy crotalaria *	Crotalaria spectabilis Roth
Shrubby stylo *	Stylosanthes scabra Vogel
Siberian wheatgrass *	Agropyron sibiricum (Will.)
Sickle medick *	Medicago falcata L.
Side-oats grama *	Bouteloua curtipendula (M.)
Signal grass	Brachiaria brizantha (A.R.)
Silky oak *	Grevillea robusta A.Cunn.
Silver oak *	Grevillea parallella J.Kni.
Silver quandong *	Elaeocarpus grandis F.Muell

Silver Wattle	Acacia glaucocarpa Maiden
Silverleaf desmodium	Desmodium uncinatum (J.) DC
Silvertop Ash	Eucalyptus sieberi L.Johns.
Silvery birdsfoot tref*	Lotus creticus L.
Sinai meadow grass *	Poa sinaica Steud.
Siratro	Macroptilium atropurpureum
Sisal	Agave sisalana Perrine
Sissoo *	Dalbergia sissoo Roxb.
Six-weeks three-awn *	Aristida adscensionis L.
Slash pine *	Pinus elliottii, elliottii
Slender wheatgrass *	Agropyron trachycaulum Link
Slenderleaf crotalaria*	Crotalaria brevides Benth.
Sloughgrass *	Beckmannia syzigachne (St.)
Small hope clover *	Trifolium dubium Sibth.
Small-fruited grey gum	Eucalyptus propinqua D.& M.
Small-leaved mahogany *	Swietenia mahagoni (L) Jacq
Small-stilted mangrove*	Rhizophora stylosa Griffith
Smilograss *	Oryzopsis miliacea (L.) As.
Smooth crotalaria *	Crotalaria pallida Ait.
Smooth luffa *	Luffa cylindrica (L.) M.J.R
Smooth meadow grass	Poa pratensis L.
Smooth-barked apple *	Angophora costata (Gaertn.)
Snail clover *	Medicago rugosa Desr.
Snail medic *	Medicago scutellata (L)Mill
Snake gourd *	Trichosanthes cucumerina L.
Snakewood *	Acacia xiphohylla E. Pritz.
Snow gum *	Eucalyptus pauciflora Sieb.
Socotrine aloe *	Aloe perryi Baker
Sodum apple	Solanum incanum L.
Soft maize	Zea mays v. amylacea Sturt
Soft yar *	Casuarina oligodon L.Johns.
Soliane *	Aristida plumosa L.
Sorghum (high altitude)	Sorghum bicolor (L.) Moench
Sorghum (low altitude)	Sorghum bicolor (L.) Moench
Sorghum (med. altitude)	Sorghum bicolor (L.) Moench
Souari nut *	Caryocar nuciferum L.
Sour orange	Citrus aurantium L.
Soursop	Annona muricata L.
Southern blue gum	Eucalyptus globulus bicost.
Southern mahogany	Eucalyptus botryoides Smith
Southern sassafras *	Atherosperma moschatum Lab.
Southernwood *	Artemisia abrotanum L.
Sowpea *	Vigna unguiculata bliflo. L
Soyabean	Glycine max (L.) Merrill
Spanish broom *	Spartium junceum L.
Spanish clover	Desmodium sandwicense E.Me.
Spanish greens	Amaranthus cruentus L.
Spanish lime *	Melicoccus bijugatus Jacq.
Spanish sainfoin *	Hedysarum coronarium L.
Spearmint *	Mentha spicata L. v. crispa
Spelt *	Triticum spelta L.
Spike lavender	Lavandula latifolia (L.f.)
Spinach	Spinacia oleracea L.
Spinach beet	Beta vulgaris L. v flavesc.
Spodiopongo sibiricus *	Spodiopongo sibiricus Trin
Spotted burclover *	Medicago arabica (L.) Huds.
Spotted gum	Eucalyptus maculata Hook.
Spotted silky oak *	Buckinghamia celsissima F.M
Springer asparagus *	Asparagus densiflorus cv S.
Sprouting broccoli	Brassica oleracea L.v ital.
Squash gourd	Cucurbita maxima Duch ex L.
St Augustine grass *	Stenotaphrum secundatum (W)

St. John's gum	Eucalyptus st.-johnii
Star gooseberry	Sauropus androgynus Merrill
Starapple *	Chrysophyllum cainito L.
Stargrass *	Cynodon plectostachyus (K.)
Sterile oat *	Avena sterilis L.
Stevia *	Stevia rebaudiana (Bertoni)
Stiff Hair wheatgrass *	Agropyron trichophorum Lin.
Strand medic *	Medicago littoralis Rhode
Strawberry clover *	Trifolium fragiferum L.
Streambank wheatgrass *	Agropyron riparium Scribn.
Stripa baicalensis *	Stripa baicalensis Roshev
Stripa breviflora *	Stripa breviflora Griseb.
Stripa capillata	Stripa capillata L.
Stripa glareosa *	Stripa glareosa Smirn.
Stripa gobica *	Stripa gobica Roshev.
Stripa grandis *	Stripa grandis Smirn.
Stripa Krylovii *	Stripa Krylovii Roshev.
Sturt Creek mallee *	Eucalyptus odontocarpa F.M.
Stylosanthes *	Stylosanthes capitata Vogel
Stylosanthes macro. *	Stylosanthes macrocephala
Subterranean clover *	Trifolium subterraneum L.
Sudan grass	Sorghum x drummondii (S.)
Sudan potato *	Coleus parviflorus Benth.
Sudan teak *	Cordia africana Lam.
Sugar apple *	Annona squamosa L.
Sugar beet	Beta vulgaris L. v vulgaris
Sugar gum	Eucalyptus cladocalyx F. M.
Sugar maple *	Acer saccharum
Sugar palm *	Arenga pinnata (Wurmb.)Merr
Sugarcane	Saccharum officinarum L.
Sugarcane	Saccharum robustum Brandes
Sugi *	Cryptomeria japonica (L.f.)
Suli *	Acacia oraria F. Muell.
Sulla annuel *	Hedysarum flexuosum L.
Sulla epineux *	Hedysarum spinosissimum L.
Sulla pale *	Hedysarum pallidum Desf.
Sulla rose *	Hedysarum carnosum Desf.
Summer savory *	Satureia hortensis L.
Sunberry	Solanum instrusum
Sundri *	Heritiera Fomes Buch.
Sunflower	Helianthus annuus L v macro
Sunn hemp	Crotalaria juncea L.
Sunolgrass *	Phalaris coerulescens Desf.
Sunset hibiscus *	Abelmoschus manihot (L.) M.
Supplejack *	Ventilago viminalis Hook
Supplejack *	Ventilago viminalis Hook
Surinam grass	Brachiaria decumbens Stapf
Swamp box *	Lophostemon suaveolens Sol.
Swamp corkwood *	Sesbania formosa (F.Muell.)
Swamp cypress *	Taxodium distichum (L) Rich
Swamp gum *	Eucalyptus rudis Endl.
Swamp mahogany	Eucalyptus robusta Smith
Swamp oak *	Terminalia brassii Exell
Swamp rice grass *	Leersia hexandra Sw.
Swamp sheoak	Casuarina glauca Sieber ex
Swamp tea-tree *	Melaleuca cajuputi Powell.
Swede rap	Brassica napus L.
Sweet balm *	Melissa officinalis L.
Sweet bay *	Laurus nobilis L.
Sweet clover *	Melilotus suaveolens Ledeb.
Sweet Corn	Zea mays v.saccharata Sturt
Sweet flag *	Acorus calamus L.

Sweet gourd *	Momordica cochinchinensis
Sweet granadilla *	Passiflora ligularis Juss.
Sweet marjoram *	Majorana hortensis (M.)
Sweet orange	Citrus sinensis (L.) Osbeck
Sweet pepper	Capsicum annuum L.
Sweet potato	Ipomoea batatas (L.) Lam.
Sweet-pitted grass *	Bothriochloa insculpta (A.)
Swiss chard	Beta vulgaris L. v cicla
Switchgrass *	Panicum virgatum L.
Sword bean	Canavalia gladiata (Jacq)DC
Sydney blue gum	Eucalyptus saligna Smith
Tagal mangrove *	Ceriops tagal (Perr.)C.B.R.
Tagasaste *	Cytisus proliferus L. f.
Tahiti lime	Citrus latifolia Tan.
Tall fescue *	Festuca arundinacea Schreb.
Tall wheatgrass *	Agropyron elongatum (Host)
Tallow wood	Eucalyptus microcorys F.Mu.
Tamarind	Tamarindus indica L.
Tamarind *	Diploglottis cunninghamii H
Tamarisk (Chinese) *	Tamarix chinensis Lour.
Tamarisk *	Tamarix aphylla (L.) Karst.
Tamarugo *	Prosopis tamarugo F. Phil.
Tambookie grass	Hyparrhenia hirta (L) Stapf
Tan wattle	Acacia auriculiformis A.Cu.
Tanner grass *	Brachiaria radicans Napper
Tannia	Xanthosoma sagittifolium L.
Tarong pasai *	Solanum ferox L.
Tarragon *	Artemisia dracunculus L.
Tartary buckwheat *	Fagopyrum tataricum
Taru *	Bambusa longispiculata Gam.
Tarwi	Lupinus mutabilis Sweet
Tasman.alp.yellow gum *	Eucalyptus subcrenulata Ma.
Tasmanian blue-gum	Eucalyptus globulus globul.
Tasmanian yellow gum *	Eucalyptus johnstonii Maid.
Tauri wheatgrass *	Agropyron tauri Boiss.&Bal.
Tea	Camellia sinensis (L) O.K.
Teak *	Tectona grandis L.f.
Teff *	Eragrostis tef (Zucc.) Trot
Tembusu *	Fagraea fragrans Roxb.
Tenasserim pine *	Pinus merkusii, continental
Tenasserim pine *	Pinus merkusii, island
Tendu *	Diospyros melanoxylon Roxb.
Teosinte	Zea mexicana (Schard.) Ree.
Tepary bean	Phaseolus acutifolius Gray
Thickspine wheatgrass *	Agropyron dasystachyum
Thingam *	Hopea wightiana Wall.
Thingan *	Hopea odorata Roxb.
Thin-leav. stringybark*	Eucalyptus eugenioides Sie.
Thorny bamboo *	Bambusa arundinacea Willd.
Thyme *	Thymus vulgaris L.
Tifton medick *	Medicago rigidula (L.) All.
Timothy	Phleum pratense L.
Tinne-red *	Gluta travancorica Bedd.
Tiyowa *	Thyrsostachys siamensis Ga.
Tobacco	Nicotiana tabacum L.
Tobosa grass *	Hilaria mutica (Buckl.) Be.
Tomatillo *	Physalis philadelphica Lam.
Tomato	Lycopersicon esculentum M.
Tonka bean *	Dipteryx odorata (Aubl) Wi.
Toona *	Toona ciliata M.J. Roem
Tooroo *	Acacia rothii Bailey
Torathi *	Hydnocarpus alpina Wight

Torpedo grass *	Panicum repens L.
Torulosa wattle *	Acacia torulosa Benth.
Townsville lucerne	Stylosanthes humilis H.B.K.
Trailing indigo *	Indigofera spicata Forsk.
Tree cotton	Gossypium arboreum L.
Tree tomato	Cyphomandra betacea (Cav.)
Trifolium pilulare *	Trifolium pilulare Boiss.
Trincomalee wood *	Berrya cordifolia (Willd.)
Triple awned grass *	Aristida obtusa Del.
Tropical carpet grass	Axonopus compressus (Sw.) B
Tropical kudzu	Pueraria phaseoloides (R.)
True lavender *	Lavandula angustifolia Mill
Tuart	Eucalyptus gomphocephala DC
Tuba merah *	Derris malaccensis (Benth.)
Tuba root *	Derris elliptica (Roxb) Be.
Tulda *	Bambusa tulda Roxb.
Tulo balsam *	Myroxylon balsamum (L) Har.
Tumeric *	Curcuma domestica Val.
Tung-oil-tree *	Aleurites fordii Hemsl.
Turgid panic grass *	Panicum turgidum Forsk.
Turkish hazel *	Corylus colurna L.
Turnip rap	Brassica rapa L. v rapifera
Turpentine *	Acacia monticola J.M. Black
Turpentine *	Syncarpia glomulifera (Sm.)
Udal *	Sterculia villosa Roxb.
Ulin ironwood *	Eusideroxylon zwageri Teij.
Ullucu *	Ullucus tuberosus Caldas
Umbrella mulga *	Acacia brachystachya Benth.
Umbrella pine *	Pinus pinea L.
Umbrella thorn *	Acacia tortilis (Forsk) Ha.
Umbrella tree *	Musanga cecropioides R.Br.
Urd bean	Vigna mungo (L.) Hepper
Urena *	Urena lobata L.
Uvalha	Eugenia uvalha Camb.
Valangur *	Polyscias verticillata Ston
Valerian *	Valeriana officinals L.
Vanilla *	Vanilla planifolia Andrews
Variegated alfalfa *	Medicago varia Martyrn.
Vasey grass *	Paspalum urvillei Steud.
Vegetable marrow	Cucurbita pepo L.
Veldtgrass *	Ehrharta calycina Sm.
Velvet bean *	Mucuna pruriens (L.) DC.
Velvet bentgrass	Agrostis canina L.
Vetiver grass	Vetiveria zizanioides (L.)
Vigna hosei *	Vigna hosei (Craib) Back.
Vine mesquite *	Panicum obtusum
Virginia live oak *	Quercus virginiana
Virginia strawberry *	Fragaria virginiana Duch.
Virginian centro *	Centrosema virginianum L.B.
Vitoria Spring mallee *	Eucalyptus trivalvis Blake.
Vogel fig *	Ficus vogelii (Miq.) Miq.
W. Austral. blackbutt *	Eucalyptus patens Benth.
W.Austral.swamp sheoak*	Casuarina obesa Miq.
Waabo *	Dendrocalamus giganteus Mu.
Wah-roon *	Acacia holosericea A. Cunn
Wampee *	Clausena lansium (Lour.) S.
Wandi ironbark *	Eucalyptus jensenii Maiden
Wandoo *	Eucalyptus wandoo Blakely
Water hyacinth	Eichhornia crassipes (Mar.)
Water mimosa *	Neptunia prostrata (Lamk) B
Watercress	Nasturtium officinale R.Br.
Waterleaf *	Talinum triangulare (Jacq.)

Water-lemon *	Passiflora laurifolia L.
Watermelon	Citrullus lanatus (T) Mansf
Wax gourd *	Benincasa hispida (T.) Cogn
Waxy maize	Zea mays v. ceratina Kulash
Wedge leaflet fan palm*	Licuala ramsayi (F.Muell.)
Weeping love grass	Eragrostis curvula (Sch.) N
Welsh onion	Allium fistulosum L.
West Australian sheoak*	Casuarina fraseriana Miq.
West Himalayan fir *	Abies pindrow Spach.
West Himalayan spruce *	Picea morida Link.
West Indian cedar *	Cedrela odorata L.
West Indian lemongrass*	Cymbopogon citratus (DC.)
West Indian pine *	Pinus occidentalis Swartz
Western elderberry *	Sambucus cerulea Nutt.
Western wheatgrass	Agropyron smithii Rydb.
Wheat, club *	Triticum compactum Host
Wheat, common	Triticum aestivum L.
Wheat, durum *	Triticum durum Desf.
White ash *	Eucalyptus fraxinoides Dea.
White beech *	Gmelina leichhardtii (F.M.)
White box *	Eucalyptus albens Benth.
White buffel grass *	Cenchrus pennisetiformis H.
White cedar *	Melia azedarach v austral.
White cheesewood *	Alstonia scholaris (L)R.Br.
White clover	Trifolium repens L.
White cypress pine *	Callitris glauca R.Br ex R.
White Dhup *	Vateria indica L.
White honysuckle	Banksia integrifolia L. f.
White Jute	Corchorus capsularis L.
White kongu *	Hopea parviflora Bedd.
White Lupin	Lupinus albus L.
White mallee *	Eucalyptus dumosa Cunn.
White mangrove *	Avicennia officinalis L.
White mangrove *	Laguncularia racemosa (L.)
White meadowfoam *	Limnanthes alba
White mulberry	Morus alba L.
White mustard	Sinapis alba L.
White peppermint *	Eucalyptus pulchella Desf.
White siris *	Albizia procera (Roxb.)Ben.
White sweetclover	Melilotus alba Medik.
White tephrosia *	Tephrosia candida (Roxb.)DC
White wood *	Atalaya hemiglauca (F. Mu.)
White yam	Dioscorea rotundata Poir.
Whitetip clover *	Trifolium variegatum Nutt.
White-topped box *	Eucalyptus quadrangulata D.
Wick grass *	Hymenachne acutigluma (S.)
Wild cane	Saccharum spontaneum L.
Wild durian *	Cullenia rosayroana Koster.
Wild oat	Avena fatau L.
Wild olive *	Olea africana Miller
Wild pear *	Persoonia falcata R. Br.
Wild thyme *	Thymus serpyllum L.
Wild yam *	Dioscorea floribunda M.&G.
Wildrye, Russian	Psathyrostachys juncea (F.)
Wine palm *	Raphia hookeri Mann.& Wendl
Winter savory *	Satureia montana L.
Winter squash	Cucurbita mixta Pang.
Winter thorn *	Acacia albida Del.
Winti *	Melaleuca arcana S.T. Blake
Wirewood *	Acacia coriacea DC.
Wodier *	Lannea coromandelica (Hou.)
Wolly trefoil *	Trifolium tomentosum

Wool grass *	Anthephora pubescens Nees
Woolly finger grass *	Digitaria pentzii Stent
Woolly oak *	Quercus lanuginosa Don.
Woollybutt *	Eucalyptus longifolia Link
Woolypod vetch	Vicia villosa Roth
Wormseed *	Chenopodium ambrosioides L.
Wrinkle duck-beak *	Ischaemum rugosum Salisb.
Yacon	Polymnia sonchifolia P.& E.
Yam bean *	Pachyrrhizus erosus L Urban
Yapunyah *	Eucalyptus ochrophloia F.M.
Yate *	Eucalyptus cornuta Labill.
Yellow bluestem	Bothriochloa ischaemum (L.)
Yellow box	Eucalyptus melliodora Cunn.
Yellow carabeen *	Sloanea woollsii F. Muell.
Yellow cassia *	Cassia siamea Lam.
Yellow flane *	Peltophorum pterocarpum DC
Yellow Lupin	Lupinus luteus L.
Yellow quinine	Cinchona ledgeriana Moens
Yellow stringybark *	Eucalyptus muellerana A.Ho.
Yellow sweetclover	Melilotus officinalis Lam.
Yellow tingle *	Eucalyptus guilfoylei Maid.
Yellow yam	Dioscorea cayenensis Lam.
Yellow-bark. paperbark*	Melaleuca nervosa (Lindley)
Yemane *	Gmelina arborea Roxb.
Yertchuk *	Eucalyptus consideniana Ma.
Ylang-ylang *	Cananga odorata (Lam.) Ho.
York gum *	Eucalyptus loxophleba Benth
Zedoary *	Curcuma zedoaria (Christm.)
Zigzag clover *	Trifolium medium L.
Zombi pea *	Vigna vexillata (L.) A.Rich

Current and Potential PlantGro Plant Files
Listing by Scientific Name

(* Denotes that there is limited data about this plant)

Scientific Name	Common Name
Abelmoschus esculentus (L.)	Okra, lady fingers
Abelmoschus manihot (L.) M.	Sunset hibiscus *
Abies pindrow Spach.	West Himalayan fir *
Abroma augustum (L.) L.f.	Perennial Indian hemp *
Abutilon theopharasti Medic	China Jute *
Acacia acradenia F. Muell.	Acacia acradenia *
Acacia acuminata Benth.	Rasberry jam *
Acacia albida Del.	Winter thorn *
Acacia ammobia Macconochie	Acacia ammobia *
Acacia ampliceps B.R.Maslin	Salt wattle *
Acacia ancistrocarpa Maid.	Fitzroy wattle *
Acacia aneura F. Muell.	Mulga *
Acacia anticeps Tind	Acacia anticeps *
Acacia argyrodendron Domin.	Black gidyea *
Acacia aulacocarpa Cunn.	Brown salwood *
Acacia auriculiformis A.Cu.	Tan wattle
Acacia bidwillii Benth.	Corkwood wattle *
Acacia brachystachya Benth.	Umbrella mulga *
Acacia brassii Pedley	Acacia brassii *
Acacia burrowii Maiden	Burrows wattle *
Acacia calcicola Forde&Isi.	Grey myall *
Acacia cambagei R.T. Baker	Gidgee *
Acacia cattechu (L.f.) Will	Cutch tree *
Acacia cincinnata F. Muell.	Acacia cincinnata *
Acacia coriacea DC.	Wirewood *
Acacia cowleana Tate	Halls Creek wattle *
Acacia crassicarpa A.Cunn.	Northern wattle *
Acacia cyclops A. Cunn.	Rooikrans *
Acacia decurrens Willd.	Green wattle
Acacia dictyophleba F.Muell	Acacia dictyophleba *
Acacia difficilis Maiden	Acacia difficilis *
Acacia falciformis DC.	Broad-leaved hickory *
Acacia farnesiana (L) Willd	Huisache *
Acacia fasciculifera F.Mue.	Rose wattle *
Acacia flavescens A.Cunn.	Red wattle *
Acacia glaucocaesia Domin	Acacia glaucocaesia
Acacia glaucocarpa Maiden	Silver Wattle
Acacia harpophylla F.Muell.	Brigalow *
Acacia holosericea A. Cunn	Wah-roon *
Acacia irrorata Sieb. ex S.	Green wattle *
Acacia jennerae Maiden	Acacia jennerae *
Acacia jensenii Maiden	Acacia jensenii *
Acacia julifera Benth.(gil)	Acacia julifera (gil) *
Acacia julifera Benth.(gil)	Acacia julifera (gil) *
Acacia laeta R.Br.ex Benth.	Acacia laeta *
Acacia latzii Maslin.	Latzs wattle *
Acacia leptocarpa A. Cunn.	Acacia leptocarpa *
Acacia leucophloea (Roxb.)	Pilang *
Acacia ligulata A. Cunn.	Sandhill wattle *
Acacia macdonnelliensis Ma.	Irrara *
Acacia maconochieana Pedley	Acacia maconochieana *
Acacia maidenii F. Muell.	Maidens wattle *
Acacia mangium Willd.	Mangium *
Acacia mearnsii De Wild.	Black wattle *

Acacia melanoxylon R. Br.	Australian blackwood
Acacia millifera (Vahl)Bent	Acacia millifera
Acacia monticola J.M. Black	Turpentine *
Acacia murrayana F. Muell	Sandplain wattle *
Acacia neriifolia Cunn.	Oleander wattle *
Acacia nilotica (L.) Willd.	Babul *
Acacia oraria F. Muell.	Suli *
Acacia pachyacra Maiden & B	Acacia pachyacra *
Acacia parchcarpa F. Muell.	Acacia parchcarpa *
Acacia pendula A. Cunn.	Myall *
Acacia plectocarpa A. Cunn.	Black wattle *
Acacia podalyriifolia A. C.	Queensl. silver wattle*
Acacia polystachya A. Cunn.	Acacia polystachya *
Acacia pruinocarpa Tindale	Black gidgee *
Acacia pycnantha Benth.	Golden wattle
Acacia rothii Bailey	Tooroo *
Acacia salicina Lindl.	Cooba *
Acacia saligna (Labill) H.	Orange wattle
Acacia senegal (L.) Willd.	Gum arabic tree *
Acacia seyal Del.	Shittim wood *
Acacia shirleyi Maiden	Lancewood *
Acacia silvestris Tindale	Bodalla wattle *
Acacia simsii A. Cunn ex B.	Heathlands wattle *
Acacia simsii A. Cunn ex B.	Heathlands wattle *
Acacia stenophylla A. Cunn.	River cooba *
Acacia synchronicia Maslin	Acacia synchronicia *
Acacia tephrina Pedley	Boree *
Acacia tortilis (Forsk) Ha.	Umbrella thorn *
Acacia torulosa Benth.	Torulosa wattle *
Acacia trachycarpa E. Prit.	Minni Ritchi *
Acacia tumida F. Muell ex B	Pindan wattle *
Acacia victoriae Benth.	Prickly wattle *
Acacia xiphohylla E. Pritz.	Snakewood *
Acanthus ilicifolius L.	Acanthus *
Acehmea magdalenae Andre	Pita fibre *
Acer caesium Wall.	Kainsal *
Acer saccharum	Sugar maple *
Achnatherum splendens (Tr.)	Achnatherum splendens *
Acmena smithii (Poiret) Me.	Lilly pilly *
Acorus calamus L.	Sweet flag *
Acrocarpus fraxinifolius W.	Shingle tree *
Acroceras macrum Stapf	Nile grass
Actinidia chinensis Planch.	Kiwifruit *
Adansonia digitata F.Muell	Baobab *
Adansonia gregorii F.Muell.	Bottle tree *
Adhatoda vasica (L.) Ness.	Malabar nut *
Adina cordifolia Hook. f.	Haldu *
Aegiceras corniculatum Bla.	Kulsi *
Aegle marmelos Cottea	Bael *
Aeschynomene americana L.	American joint vetch *
Aeschynomene falcata (P.)DC	Joint vetch *
Aeschynomene indica L.	Budda pea *
Aesculus indica Griff.	Indian horse chestnut *
Aframomum corrorima (Braun)	Korarima *
Aframomum melegueta (Ros.)	Melegueta-pepper *
Afzelia africana Smith	Afzelia africana *
Agaricus bisporus	Mushroom, cultivated
Agathis australis (D. Don)	Kauri *
Agathis dammara (A.B. Lamb)	Damar *
Agathis labillardieri Warb.	New Guinea kauri *
Agathis macrophylla (Lindl)	Kauri pine *
Agathis microstachya Bailey	Kauri pine *

Agathis robusta (Moore) Ba.	Kauri pine *
Agave cantala Roxb.	Cantala fibre *
Agave fourcroydes Lemaire	Henequen *
Agave lecheguilla Torrey	Istle *
Agave sisalana Perrine	Sisal
Agropyron cristatum (L.) G.	Crested wheatgrass Fw.
Agropyron dasystachyum	Thickspine wheatgrass *
Agropyron desertorum (Fis.)	Crested wheatgrass
Agropyron elongatum (Host)	Tall wheatgrass *
Agropyron intermedium Host	Grenar wheatgrass *
Agropyron mongolicum Keng	Agropyron mongolicum *
Agropyron repens (L.)Beauv.	Quarkgrass *
Agropyron riparium Scribn.	Streambank wheatgrass *
Agropyron sibiricum (Will.)	Siberian wheatgrass *
Agropyron smithii Rydb.	Western wheatgrass
Agropyron spicatum (Pursh)	Bluebunch wheatgrass
Agropyron tauri Boiss.&Bal.	Tauri wheatgrass *
Agropyron trachycaulum Link	Slender wheatgrass *
Agropyron trichophorum Lin.	Stiff Hair wheatgrass *
Agrostis canina L.	Velvet bentgrass
Agrostis gigantea Roth.	Common bentgrass
Agrostis stolonifera L.	Creeping bentgrass *
Agrostis tenuis Sibth.	Colonial bentgrass *
Agrostis trinii Turcz.	Agrostis trinii *
Ailanthus altissima (Mill.)	Ailanthus *
Ailanthus excelsa Roxb.	Maharukh *
Ailanthus grandis Prain	Gokul *
Albizia chinensis (Osb.) M.	Karai *
Albizia falcataria (L.) Fo.	Batai *
Albizia lebbeck (L.) Benth.	East Indian walnut *
Albizia lophantha (Willd.)	Crested wattle *
Albizia lucida Benth.	Burmese siris *
Albizia odoratissima Benth	Black siris *
Albizia procera (Roxb.)Ben.	White siris *
Albizia pullenii Verdc.	Albizia pullenii *
Albizia stipulata Boivin.	Chakua *
Albizia toona Bailey	Red siris *
Aleurites fordii Hemsl.	Tung-oil-tree *
Aleurites moluccana (L.) W.	Candlenut *
Aleurites montana (Lour.)	Mu-oil-tree *
Allium ampeloprasum L.v p.	Leek
Allium cepa L. v aggregatum	Shallot
Allium cepa L. v cepa	Onion
Allium chinense G. Don	Rakkyo
Allium fistulosum L.	Welsh onion
Allium sativum L.	Garlic
Allium schoenoprasum L.	Chives
Allium tuberosum Rottler	Chinese chives
Alnus acuminata O. Kuntze	Alder *
Alnus japonica (Thunb.) St.	Japanese alder
Alnus nepalensis D. Don	Nepalese alder *
Alnus rubra Bong.	Red alder *
Alocasia macrorrhiza (L) S	Giant taro *
Aloe ferox Miller	Cape aloe *
Aloe perryi Baker	Socotrine aloe *
Alopecurus arundinaceus Po.	Creeping foxtail *
Alopecurus pratensis L.	Meadow foxtail
Alphityonia excelsa (Fren.)	Red ash *
Alpinia galanga (L.) Willd.	Greater galanga *
Alpinia officinarum Hance	Lesser galanga *
Alstonia scholaris (L)R.Br.	White cheesewood *
Altingia excelsa Norona	Rasamala *

Alysicarpus vaginalis L. DC	Alyce clover *
Amaranthus caudatus L.	Inca wheat
Amaranthus cruentus L.	Spanish greens
Amaranthus dubius L.	Amaranth
Amaranthus hypochondriacus	Princess feather *
Amaranthus lividus L.	Livid amaranth *
Amaranthus spp.	Amaranthus
Amaranthus tricolor L.	Chinese amarath
Ammandra natalia	Fibra *
Ammophila arenaria (L.)Link	European beachgrass *
Ammophilla breviligulata F.	American beachgrass *
Amorphophallus campanulatus	Elephant yam *
Anacardium occidentale L.	Cashew
Ananas comosus (L) Merr.	Pineapple
Andropogon gayanus Kunth	Gamba grass
Andropogon gerardii Vitman	Big bluestem *
Andropogon hallii Hack.	Sand bluestem *
Anethum graveolens L.	Dill *
Angelica archangelica L.	Garden angelica
Angophora costata (Gaertn.)	Smooth-barked apple *
Angophora floribunda (Smi.)	Rough-barked apple *
Anisoptera scaphula (Roxb.)	Boilam *
Annona atemoya Hort	Atemoya
Annona cherimolia Miller	Cherimoya
Annona diversifolia Saff.	Ilama *
Annona montana Macfad.	Mountain soursop *
Annona muricata L.	Soursop
Annona reticulata L.	Bullock's heart
Annona scleroderma Saff.	Poshte *
Annona squamosa L.	Sugar apple *
Anogeissus acuminata Wall.	Chakwa *
Anogeissus latifolia (Roxb)	Axlewood *
Anogeissus latifolia (Roxb)	Axlewood *
Anogeissus pendula Edgew.	Kardhai *
Anthemis nobilis (L.) All.)	Chamomile *
Anthephora pubescens Nees	Wool grass *
Anthocephalus chinensis Lam	Kadam *
Anthocephalus macrophyllus	Samama *
Anthriscus cerefolium L.	Chervil *
Anthyllis vulneraria L.	Kidney vetch *
Antidesma bunius (L.) Spre.	Bignay *
Apium graveolens L. v rapac	Celeriac
Arachis glabrata Benth.	Rhizoma peanut *
Arachis hypogaea L.	Groundnut
Arachis pintoi Krap.& Greg.	Pinto peanut *
Araucaria angustifolia Ber.	Parana pine *
Araucaria bidwillii Hook.	Bunya pine *
Araucaria cunninghamii Ait.	Hoop pine *
Araucaria hunsteinii K.Sch.	Klinkii pine *
Archidendron jiringa (Jack)	Jengkol *
Archontophoenix cunningham.	Bangalow palm *
Areca catechu L.	Betel palm
Arenga pinnata (Wurmb.)Merr	Sugar palm *
Argyrodendron actinophyllum	Blush tulip oak * (act)
Argyrodendron actinophyllum	Blush tulip oak * (div)
Argyrodendron peralatum Ba.	Red tulip oak *
Aristida adscensionis L.	Six-weeks three-awn *
Aristida ciliata Desf.	Nissi *
Aristida lanata Forssk.	Shafshoof ain seela *
Aristida latifolia Domin	Feathertop wire grass *
Aristida obtusa Del.	Triple awned grass *
Aristida pennata Trin.	Aristida pennata *

Aristida plumosa L.	Soliane *
Aristida pungens Desf.	Drin *
Aristida raddiana Savi.	Nussi *
Armoracia rusticana P.Gaer.	Horseradish
Arracacia xanthorrhiza Ban.	Peruvian carrot *
Arrhenatherum elatius (L.)	Meadow oat grass *
Artemisia abrotanum L.	Southernwood *
Artemisia dracunculus L.	Tarragon *
Artocarpus altilis (Park.)	Breadfruit
Artocarpus chaplasha Roxb.	Chaplash *
Artocarpus heterophyllus L.	Jackfruit
Artocarpus hirsuta Lam.	Ranphannas *
Artocarpus integer (Thunb.)	Chempedak *
Artocarpus lakoocha Roxb.	Monkey jack *
Arundinaria pusilla A. Che.	Bamboo grass *
Arundinella hirta (Thunb) K	Arundinella hirta *
Asiminia triloba (L.) Dunal	Custard banana
Asparagus densiflorus cv S.	Springer asparagus *
Asparagus officinalis L.	Asparagus
Astragalus cicer L.	Cicer milkvetch *
Astragalus gummifer Labill.	Gum tragacanth *
Astrebla elymoides F. Muell	Hoop mitchell grass *
Astrebla lappacea (Lindl.)	Curly mitchell grass *
Astrebla pectinata (Lindl.)	Barley mitchell grass *
Astrebla squarrosa C.E.Hubb	Bull mitchell grass *
Astrocaryum jauari	Jauari *
Asystasia gangetica (L.)T.A	Rumbut bunga putih *
Atalaya hemiglauca (F. Mu.)	White wood *
Atherosperma moschatum Lab.	Southern sassafras *
Athrotaxis selaginoides Don	King William pine *
Atriplex canescens (Pursh.)	Fourwing saltbush *
Atriplex confertifolia (T.)	Shadscale *
Atriplex gardneri	Gardner saltbush *
Atriplex glauca L.	Guettafia *
Atriplex halimus L.	Mediterranean sal *
Atriplex hortensis L.	Garden oarch *
Atriplex lentiformis (Tor.)	Quail bush *
Atriplex nummularia Lindl.	Old man saltbush *
Atriplex vesicaria Heward	Bladder saltbush *
Attalea funifera Mart.	Bahia piassava palm *
Aucoumea klaineana Pierre	Gaboon *
Auricularia spp.	Jew's ear *
Avena byzantina K. Koch	Red oat *
Avena fatau L.	Wild oat
Avena sativa L.	Oats
Avena sterilis L.	Sterile oat *
Averrhoa bilimbi L.	Bilimbi *
Averrhoa carambola L.	Carambola
Avicennia germinans (L.) L.	Black mangrove *
Avicennia marina (Forsk.) V	Grey mangrove *
Avicennia officinalis L.	White mangrove *
Axonopus affinis Chase	Carpet grass
Axonopus compressus (Sw.) B	Tropical carpet grass
Axonopus scoparius (Flugge)	Imperial *
Azadirachta indica A. Juss.	Neem *
Baccaurea motleyana (Muel.)	Rambai *
Baccaurea ramiflora Lour.	Burmese grape *
Baccaurea recamosa (Reinw.)	Kapundung *
Bactris gasipaes H.B.K.	Peach palm
Balanites aegyptiaca (L)Del	Desert date *
Bambusa arundinacea Willd.	Thorny bamboo *
Bambusa balcooa Roxb.	Barobans *

Bambusa longispiculata Gam.	Taru *
Bambusa nutans Wall.	Bamboo nutans *
Bambusa polymorpha Munro.	Kyathaungwa *
Bambusa tulda Roxb.	Tulda *
Bambusa vulgaris Schrad.	Bariala *
Banksia integrifolia L. f.	White honysuckle
Baphia nitida Lodd.	Camwood *
Basella alba L.	Ceylon spinach
Bassia latifolia Roxb.	Kat illipi *
Bauhinia esculenta Burchell	Camel's foot *
Bauhinia racemosa L.	Bauhinia *
Beckmannia syzigachne (St.)	Sloughgrass *
Benincasa hispida (T.) Cogn	Wax gourd *
Berrya cordifolia (Willd.)	Trincomalee wood *
Bertholletia excelsa H.& B.	Brazil nut
Beta vulgaris L. v cicla	Swiss chard
Beta vulgaris L. v crassa	Garden beet
Beta vulgaris L. v flavesc.	Spinach beet
Beta vulgaris L. v vulgaris	Sugar beet
Bixa orellana L.	Annato *
Blighia sapida Koenig	Akee *
Boehmeria nivea (L.) Gaud.	Ramie *
Bombacopsis quinata (Jacq.)	Pochote *
Bombax ceiba L.	Red silk cotton tree
Bombax insigne Wall.	Semul *
Borassus flabellifer L.	Palmyra palm *
Boswellia serrata Roxb.	Indian olibanum tree *
Bothriochloa bladhii (Ret.)	Australian bluestem *
Bothriochloa insculpta (A.)	Sweet-pitted grass *
Bothriochloa ischaemum (L.)	Yellow bluestem
Bothriochloa pertusa (L.) C	Seymour grass
Bouteloua curtipendula (M.)	Side-oats grama *
Bouteloua gracilis (Willd.)	Blue grama *
Brachiaria brizantha (A.R.)	Signal grass
Brachiaria decumbens Stapf	Surinam grass
Brachiaria dura Stapf	Brachiaria dura *
Brachiaria humidicola (R) S	Koronivia grass *
Brachiaria mutica (For.) St	Para grass
Brachiaria radicans Napper	Tanner grass *
Brachiaria ramosa (L.)Stapf	Browntop millet *
Brachiaria ruziziensis G&E	Kennedy ruzi grass *
Brachiaria supquadripara T.	Cori grass *
Brachychiton acerifolius F.	Flame tree *
Brachychiton populneus (S.)	Kurrajong *
Brassica campestris L.	Bird rape
Brassica chinensis L.	Chinese cabbage
Brassica juncea (L.) Czern.	Leaf mustard
Brassica napus L.	Swede rap
Brassica napus L. Napobras.	Rutabaga *
Brassica nigra L.	Black mustard *
Brassica oleracea L.v acep.	Collards
Brassica oleracea L.v botr.	Cauliflower
Brassica oleracea L.v capi.	Cabbage
Brassica oleracea L.v gemm.	Brussels sprouts
Brassica oleracea L.v gong.	Kohlrabi
Brassica oleracea L.v ital.	Sprouting broccoli
Brassica rapa L. Gaisin gr.	Caisin *
Brassica rapa L. Pak Choi	Pak choi
Brassica rapa L. v rapifera	Turnip rap
Bromus carinatus Hook.&Arn.	Mountain brome
Bromus inermis Leyss.	Brome grass
Bromus marginatus Nees.	Mountain bromegrass *

Bromus tomentellus Boiss.	Russian brome grass *
Bromus unioloides Kunth	Rescue grass *
Bruguiera gymnorrhiza (L.)	Burma mangrove *
Buchanania latifolia Roxb.	Cuddapah Almond *
Buchloe dactyloides (Nutt.)	Buffalo grass *
Buckinghamia celsissima F.M	Spotted silky oak *
Bursera simaruba Sarg.	Gumbo limbo *
Butea monosperma (Lamk) Ta.	Flame-of-the-forest *
Butyrospermum paradoxum (G)	Shea butter tree *
Caesalpinia coriaria (Jacq)	Divi-divi *
Caesalpinia sappan L.	Sappanwood *
Cajanus cajan (L.) Mill ssp	Pigeon Pea
Calamagrostris epigeios L.	Calamagrostris epigei.*
Calamus caesius Blume	Rotan sega *
Calamus erinaceus (Becc.) D	Letek *
Calamus peregrinus	Rattan *
Calathea allouia (Aubl.) L.	Cornroot *
Calendula officinalis L.	Calendula *
Calliandra calothyrsus Mei.	Calliandra *
Callitris columellaris F.M.	Cypress pine *
Callitris endlicheri (Par.)	Black cypress pine *
Callitris glauca R.Br ex R.	White cypress pine *
Callitris preissii Miq. mur	Murray pine *
Callitris preissii Miq. pre	Rottnes Island pine *
Callitris preissii Miq. ver	Mallee pine *
Calophyllum apetalum Willd.	Poon *
Calophyllum elatum Bedd.	Poonspar tree *
Calophyllum inophyllum L.	Alexandrian laurel *
Calophyllum peekelii Laute.	Baula *
Calopogonium caeruleum B.S.	Caeruleum calopo *
Calopogonium mucunoides Ds.	Calopo *
Caltha palustris L.	Cowslip *
Camellia sinensis (L) O.K.	Tea
Camellia sinensis v assam.	Assam tea
Camellia sinensis v sinens.	China tea
Campanula rapunculus L.	Rampion *
Campnosperma brevipetiolata	Ketekete *
Cananga odorata (Lam.) Ho.	Ylang-ylang *
Canarium indicum L.	Java-almond *
Canarium ovatum Engl.	Pili nut *
Canavalia ensiformis (L) DC	Jack bean
Canavalia gladiata (Jacq)DC	Sword bean
Canna edulis Ker-Gawler	Edible canna
Cannabis sativa L.	Hemp
Capparis decidua (Forsk.)	Kurrel
Capparis spinosa	Caper *
Capsicum annuum L.	Sweet pepper
Capsicum baccatum L.v pend.	Pimentchien *
Capsicum chinense Jacq	Aji *
Capsicum frutescens L.	Hot pepper
Capsicum pubescens Ru.& Pa.	Goat chili *
Caragana intermedia	Caragana intermedia *
Caragana korshinskii	Caragana korshinskii *
Caragana microphylla Lam.	Caragana microphylla *
Carallia lucida Roxb.	Shengali *
Cardwellia sublimis F.Muell	Northern silky oak *
Carica papaya L.	Papaya
Carica pubescens Lenne & K.	Mountain papaya *
Cariniaria pyriformis Miers	Abarco *
Carissa carandas L.	Karanda *
Carissa edulis Vahl.	Egyptian carissa *
Carissa macrocarpa (Eckl.)	Natal-palm *

Carludovica palmata Ruiz	Panama hat palm *
Carthamus tinctoius L.	Safflower
Carum carvi L.	Caraway *
Carya illinoensis Wangenh.	Pecan nut
Caryocar nuciferum L.	Souari nut *
Caryota urens L.	Fish-tail palm *
Casimiroa edulis La Llave	Mexican apple *
Cassia alata L.	Ringworm bush *
Cassia auriculata L.	Avaram *
Cassia brewsteri (F.Muell.)	Brewster cassia *
Cassia fistula L.	Indian laburnum *
Cassia occidentalis L.	Coffee senna *
Cassia rotundifolia Persoon	Roundleaf cassia *
Cassia senna L.	Alexandrian senna *
Cassia siamea Lam.	Yellow cassia *
Castanea crenata Si. & Zu.	Japanese chestnut *
Castanea dentata Borkh.	American chestnut *
Castanea mollisima L.	Chinese chestnut *
Castanea pumila	Chinquapin *
Castanea sativa Mill.	European chestnut *
Castanospermum australe Cu.	Black bean *
Castilla elastica Cerv.	Panama rubber *
Casuarina campestris Miq.	Casuarina campestris *
Casuarina cristata Miq. cr.	Black oak *
Casuarina cunninghamiana M.	River sheoak
Casuarina decaisneana F.Meu	Desert sheoak
Casuarina dielsiana C.A.Gar	Diels' sheoak *
Casuarina equisetifolia L.	Coast sheoak
Casuarina fraseriana Miq.	West Australian sheoak*
Casuarina glauca Sieber ex	Swamp sheoak
Casuarina huegeliana Miq.	Rock sheoak *
Casuarina junghuhniana Miq.	Jemara *
Casuarina littoralis Salisb	Black sheoak *
Casuarina luehmannii R.T.B	Bull oak *
Casuarina obesa Miq.	W.Austral.swamp sheoak*
Casuarina oligodon L.Johns.	Soft yar *
Casuarina stricta Aiton	Drooping sheoak
Casuarina torulosa Aiton	Forest sheoak *
Catha edulis (Vahl) Endl.	Qat
Catharanthus roseus (L.) G.	Periwinkle
Cedrela odorata L.	West Indian cedar *
Cedrela toona Roxb.	Red cedar *
Cedrus deodara Loudon	Himalayan cedar *
Ceiba pentandra (L.) Gaertn	Kapok
Celosia argentea L.	Cock's comb *
Celtris australis L.	Nettle tree *
Cenchrus biflorus Roxb.	Haskaneit *
Cenchrus ciliaris L.	Buffel grass *
Cenchrus pennisetiformis H.	White buffel grass *
Cenchrus setigerus Vahl	Birdwood grass
Centrosema acutifolium Ben.	Centrosema *
Centrosema pascuorum Benth.	Centurion *
Centrosema pubescens Benth.	Centro *
Centrosema virginianum L.B.	Virginian centro *
Cephaelis ipecacuanha (St.)	Ipecac *
Ceratonia siliqua L.	Carob
Ceratopetalum apetalum D.D.	Coachwood *
Ceriops decandra (Griff.)	Goran *
Ceriops tagal (Perr.)C.B.R.	Tagal mangrove *
Chamaedorea spp	Pacaya *
Chamaerops humilis L.	Dwarf fan palm *
Chenopodium album L.	Fat hen *

Chenopodium ambrosioides L.	Wormseed *
Chenopodium pallidicaule H.	Canihua
Chenopodium quinoa Willden.	Quinoa
Chloris gayana Kunth	Rhodes grass
Chloris virgata Sw.	Feather finger grass *
Chlorophora excelsa (Welw.)	African oak *
Chloroxylon swietenia DC.	East Indian satinwood *
Chrysanthemum cinerariaefo.	Pyrethrum
Chrysanthemum coccineum W.	Persian insect flower *
Chrysanthemum coronarium L.	Garland chrysanthemum *
Chrysophyllum cainito L.	Starapple *
Chrysopogon aciculatus (R.)	Love grass *
Chrysopogon plumulosus Hoch	Aucher's grass *
Chukrasia velutina Wt.& Arn	Chickrassy *
Cicer arietinum L.	Chick pea
Cichorium endivia L.	Endive
Cichorium intybus L.	Chicory
Cinchona calisaya Wedd.	Quinine (calisaya)
Cinchona ledgeriana Moens	Yellow quinine
Cinchona officinalis L.	Quinine
Cinchona pubescens Vahl	Red quinine
Cinnamomum burmannii (C.G)	Indonesian cassia *
Cinnamomum camphora (L.) P.	Formosa camphor tree *
Cinnamomum cassia Presl.	Chinese cassia *
Cinnamomum loureirii Nees	Saigon cassia *
Cinnamomum verum Presl.	Cinnamon *
Citrofortunella (x) microc.	Calamondin *
Citrullus colocynthis (L.)	Colocynth *
Citrullus lanatus (T) Mansf	Watermelon
Citrus aurantifolia (Chri.)	Lime
Citrus aurantium L.	Sour orange
Citrus aurantium v bergamia	Bergamot *
Citrus deliciosa Ten.	Mediterranea mandarin
Citrus latifolia Tan.	Tahiti lime
Citrus limon (L.) Burm. f.	Lemon
Citrus madurensis Lour.	Philippine lime *
Citrus maxima (Burm.) Merr.	Pummelo
Citrus medica L.	Citron
Citrus paradisi Macfad.Hook	Grapefruit
Citrus reticulata Blanco x	Mandarin
Citrus reticulata Blanco x	Mandarin
Citrus sinensis (L.) Osbeck	Sweet orange
Citrus spp	Citrus
Citrus unshiu Marcovitch	Satsuma mandarin *
Clausena lansium (Lour.) S.	Wampee *
Claviceps purpurea (Fr.)Tul	Ergot *
Cleistogenes chinensis (M.)	Cleistogenes chinensi.*
Cleistogenes squarrosa (T.)	Cleistogenes squarrosa*
Cleistopholis glauca Pierre	Ovok *
Cleome gynandra L.	Bastard mustard *
Clinelymus dahuricus (Tur.)	Clinelymus dahuricus *
Clitoria laurifolia Poir.	Laurelleaved clitoria *
Clitoria ternatea L.	Butterfly pea *
Cnicus benedictus L.	Blessed thistle *
Cnidoscolus chayamansa McV.	Chaya *
Coccoloba uvifera (L.) L.	Seagrape *
Cochlospermum religiosum L.	Butter-cup tree *
Cocos nucifera L.	Coconut
Coffea arabica L.	Coffee arabica
Coffea canephora Pierre	Coffee robusta
Coffea excelsa L.	Coffee excelsa *
Coffea liberica Bull ex He	Coffee liberica

Coix lacryma-jobi L.	Job`s tears
Cola acuminata (Beauv.) Sc.	Abata kola *
Cola nitida (Vert.) Schott	Cola-nut, commercial *
Colchicum autumnale L.	Colchicum *
Coleus amboinicus Lour.	Indian borage *
Coleus parviflorus Benth.	Sudan potato *
Colocasia esculenta (L.) S.	Cocoyam
Colocasia esculenta v. ant.	Eddoe
Colophospermum mopane (Ki.)	Butterfly tree *
Combretum micranthum G. Don	Kinkeliba *
Conocarpus erctus L.	Button mangrove *
Conocarpus lancifolius Engl	Damas *
Corchorus capsularis L.	White Jute
Corchorus olitorius L.	Long-fruited Jute
Cordia africana Lam.	Sudan teak *
Cordia alliodora (Ruiz&Pa.)	Laurel *
Coriandrum sativum L.	Coriander *
Coronilla varia L.	Crownvetch
Corylus avellana L.	European hazelnut
Corylus colurna L.	Turkish hazel *
Corylus maxima	Giant hazelnut
Cotylelobium burckii (Heim)	Resak durian *
Cotylelobium lanceolatum C.	Resak bukit *
Cotylelobium melanoxylon H.	Resak hitam *
Crambe abyssinica (Hochst)	Crambe *
Crambe maritima L.	Seakale *
Crocus sativus L.	Saffron *
Crotalaria brevides Benth.	Slenderleaf crotalaria*
Crotalaria juncea L.	Sunn hemp
Crotalaria lanceolata E.Mey	Lanceleaf crotalaria *
Crotalaria pallida Ait.	Smooth crotalaria *
Crotalaria spectabilis Roth	Showy crotalaria *
Cryptocarya erythroxylon M.	Rose maple *
Cryptomeria japonica (L.f.)	Sugi *
Cucumis melo L.	Musk melon
Cucumis sativus L.	Cucumber
Cucurbita ficifolia Bouche	Fig-leaved gourd
Cucurbita foetidissima HBK	Buffalo gourd *
Cucurbita maxima Duch ex L.	Squash gourd
Cucurbita mixta Pang.	Winter squash
Cucurbita moschata (Duch.)	Pumpkin
Cucurbita pepo L.	Vegetable marrow
Cullenia rosayroana Koster.	Wild durian *
Cuminum cyminum L.	Cumin
Cunninghamia lanceolata (L)	Chinese fir *
Cupressus arizonica Greene	Arizona cypress *
Cupressus lusitanica Mill.	Mexican cypress *
Cupressus macrocarpa Hartw.	Monterey cypress *
Cupressus torulosa Don	Bhutan cypress *
Curcuma domestica Val.	Tumeric *
Curcuma zedoaria (Christm.)	Zedoary *
Cyamopsis tetragonoloba (L)	Cluster bean
Cybistax donnellsmithii (R)	Primavera *
Cydonia oblonga Mill.	Quince *
Cymbopogon citratus (DC.)	West Indian lemongrass*
Cymbopogon flexuosus (Nees)	Malabar lemongrass *
Cymbopogon martini (R.) mo.	Rosha grass v. motia *
Cymbopogon martini (R.) so.	Rosha grass v. sofia *
Cymbopogon nardus (L) v len	False citronella *
Cymbopogon nardus (L) v mah	Citronella grass *
Cynara scolymus L.	Globe artichoke
Cynodon dactylon (L.) Pers.	Bermuda grass

Cynodon nlemfuensis Vander.	African star grass *
Cynodon plectostachyus (K.)	Stargrass *
Cynometra cauliflora L.	Namnam *
Cyperus esculentus L.	Chufa *
Cyperus rotundus L.	Nutgrass, Purple *
Cyphomandra betacea (Cav.)	Tree tomato
Cytisus proliferus L. f.	Tagasaste *
Dacrydium franklinii Hook.f	Huon pine *
Dactylis glomerata hispani.	Orchard grass Mediter.*
Dactyloctenium aegyptium L.	Crowfoot grass *
Dactyloctenium giganteum L.	Giant button grass *
Dalbergia latifolia Roxb.	Blackwood *
Dalbergia sissoo Roxb.	Sissoo *
Daucus carota L.	Carrot
Delonix regia (Boj.ex Hook)	Flamboyant *
Dendrocalamus asper (Schu.)	Giant bamboo *
Dendrocalamus giganteus Mu.	Waabo *
Dendrocalamus Hamiltonii N.	Kaghsi bans *
Dendrocalamus longispathus	Khang *
Dendrocalamus merrillianus	Bayog *
Dendrocalamus strictus Nees	Male bamboo *
Dendrolobium umbellatum L.	Horse bush *
Derris elliptica (Roxb) Be.	Tuba root *
Derris indica (Lam.) Bennet	Indian beech *
Derris malaccensis (Benth.)	Tuba merah *
Desmanthus virgatus (L.) W.	False tamarind *
Desmodium gyroides (Roxb.)	Karikut-ritkut *
Desmodium heterocarpon L.DC	Carpon desmodium *
Desmodium heterophyllum W.D	Hetero *
Desmodium incanum (Sw) DC	Kaimi clover
Desmodium intortum (Mill) U	Greenleaf desmodium
Desmodium ovalifolium	Desmodium ovalifolium *
Desmodium sandwicense E.Me.	Spanish clover
Desmodium uncinatum (J.) DC	Silverleaf desmodium
Deyeuxia angustifolia Vick.	Deyeuxia angustifolia *
Dichanthium annulatum (F.)	Diaz bluestem
Dichanthium aristatum (Po.)	Angleton bluestem
Dichanthium caricosum (L.)	Nadi blue grass *
Digitalis lanata Ehrh.	Grecian foxglove *
Digitalis purpurea L.	Digitalis *
Digitaria didactyla Willd.	Seragoon grass *
Digitaria eriantha Steudel	Pangola grass
Digitaria exilis (Kippist)	Hungry rice *
Digitaria milanjiana (R.)S.	Milanje grass *
Digitaria pentzii Stent	Woolly finger grass *
Dillenia aurea Sm.	Dillenia *
Dillenia indica L.	Elephant apple *
Dillenia pentagyna Roxb.	Dillenia *
Dimocarpus longan Lour long	Longan
Dimocarpus longan Lour male	Mata kucing *
Dioscorea alata L.	Greater yam
Dioscorea bulbifera L.	Potato yam
Dioscorea cayenensis Lam.	Yellow yam
Dioscorea composita Hemsl.	Composita yam *
Dioscorea dumetorum (K.) P.	Bitter yam
Dioscorea esculenta (L.) B.	Lesser yam
Dioscorea floribunda M.&G.	Wild yam *
Dioscorea opposita Thunb.	Chinese yam
Dioscorea rotundata Poir.	White yam
Dioscorea trifida L.	Chush-chush yam
Diospyros digyna Jaxq.	Black sapote
Diospyros kaki L.f.	Kaki *

Diospyros malabarica (Desr)	Malabar ebony *
Diospyros melanoxylon Roxb.	Tendu *
Diospyros virginiana L.	Persimmon *
Diplachne fusca (L.) Beauv.	Brown beetle grass *
Diploglottis cunninghamii H	Tamarind *
Dipterocarpus alatus Roxb.	Hairy-leafed apitong *
Dipterocarpus costatus Gaer	Dulia garjan *
Dipterocarpus indicus Bedd.	Gurjan *
Dipterocarpus macrocarpus V	Hollong *
Dipterocarpus turbinatus G.	Gurjan *
Dipteryx odorata (Aubl) Wi.	Tonka bean *
Dodonaea viscosa Jacq.	Giant hopbush *
Dodonaea viscosa ssp angus.	Giant hopbush *
Doryphora sassafras Endl.	Sassafras *
Dovyalis caffra (Hook.f.&H)	Kei-apple *
Dovyalis hebecarpa Warb.	Katembilla
Duboisia myoporoides R. Ba.	Corkwood *
Durio zibethinus Murray	Durian
Dysoxylum fraseranum (A.J.)	Rosewood *
Echinochloa colona (L) Link	Jungle rice *
Echinochloa crus-galli (L)	Barnyard millet
Echinochloa frumentacea (R)	Japanese millet *
Echinochloa pyramidalis (L)	Antelope grass
Echinochloa turneriana (D.)	Channel millet *
Echinochloa utilis Ohwi-Ya.	Shirohie millet *
Ehrharta calycina Sm.	Veldtgrass *
Eichhornia crassipes (Mar.)	Water hyacinth
Elaeagnus angustifolia L.	Russian olive *
Elaeis guineensis Jacq.	African oil palm
Elaeis oleifera	American oil palm *
Elaeocarpus grandis F.Muell	Silver quandong *
Eleocharis dulcis Trin.	Chinese water chestnut*
Elettaria cardamomum L. Ma.	Cardamom *
Eleusine africana Kennedy-O	Eleusine africana
Eleusine coracana (L)Gaertn	Finger millet
Eleusine indica (L.) G. in.	Goose grass *
Elymus canadensis L.	Canada wildrye *
Elymus cinereus Scrib.&Merr	Basin wildrye *
Elymus condensatus Presl.	Giant wildrye *
Elymus glaucus Buckl.	Blue wildrye *
Emilia sonchifolia (L.) DC.	Emilia *
Endiandra palmerstonii (B.)	Queensland walnut *
Ensete ventricosum (Welw.)	Enset *
Entolasia imbricata Stapf	Bungoma grass *
Eragrostis chloromelas Ste.	Boer love grass *
Eragrostis cilianensis (A.)	Grey love grass *
Eragrostis curvula (Sch.) N	Weeping love grass
Eragrostis lehmanniana Nees	Lehmann love grass
Eragrostis pilosa L. Beauv.	Eragrostis pilosa *
Eragrostis superba Peyr.	Masai love grass
Eragrostis tef (Zucc.) Trot	Teff *
Eragrostis tremula (Lam.) S	Bano *
Eragrostis trichodes	Sand love grass *
Eremochloa ophiuroides (M.)	Centipede grass *
Eriobotrya japonica Lindley	Loquat
Eriochloa punctata (L) Desv	Janeiro *
Eruca sativa Miller	Garden rocket *
Erythrina variegata L.	China coral tree *
Erythrina vespertilio Benth	Grey Corkwood
Erythrophleum chlorostahys	Cooktown ironwood *
Erythroxylum coca Lam.	Coca *
Eucalyptus accedens W.Fitzg	Powderbark wandoo *

Eucalyptus agglomerata Mai.	Blue-leav. stringybark*
Eucalyptus albens Benth.	White box *
Eucalyptus astringens Maid.	Brown mallet *
Eucalyptus bosistoana F.Mu.	Coast grey box *
Eucalyptus botryoides Smith	Southern mahogany
Eucalyptus brassiana S.T.B.	Cape York red gum *
Eucalyptus brevifolia F.Mu.	Nothern white gum *
Eucalyptus brockwayi C.Gar.	Dundas mahogany
Eucalyptus calophylla R.Br.	Marri *
Eucalyptus camaldulensis NP	River red gum (NP)
Eucalyptus camaldulensis NP	River red gum (SP)
Eucalyptus citriodora Hook.	Lemon sented iron gum
Eucalyptus cladocalyx F. M.	Sugar gum
Eucalyptus cloeziana F.Mue.	Gympie messmate
Eucalyptus consideniana Ma.	Yertchuk *
Eucalyptus cornuta Labill.	Yate *
Eucalyptus crebra F. Muell.	Narrow-leaved ironbark
Eucalyptus dalrympleana Ma.	Mountain gum
Eucalyptus deglupta Blume	Mindanao gum
Eucalyptus delegatensis R.	Alpine ash
Eucalyptus diversicolor F.M	Karri *
Eucalyptus dumosa Cunn.	White mallee *
Eucalyptus elata Dehnh.	River peppermint *
Eucalyptus eugenioides Sie.	Thin-leav. stringybark*
Eucalyptus exserta F. Muell	Queensland peppermint *
Eucalyptus fastigata D.& M.	Brown barrel
Eucalyptus fraxinoides Dea.	White ash *
Eucalyptus globulus bicost.	Southern blue gum
Eucalyptus globulus globul.	Tasmanian blue-gum
Eucalyptus globulus maiden.	Maiden's gum
Eucalyptus globulus pseudo.	Gippsland blue gum
Eucalyptus gomphocephala DC	Tuart
Eucalyptus gongylocarpa Bl.	Desert gum *
Eucalyptus grandis W. Hill	Flooded gum
Eucalyptus guilfoylei Maid.	Yellow tingle *
Eucalyptus gummifera (Sol.)	Red bloodwood *
Eucalyptus intermedia R.Ba.	Pink bloodwood *
Eucalyptus intertexta R.Ba.	Gum-barked Coolibah
Eucalyptus jacksonii Maiden	Red tingle *
Eucalyptus jensenii Maiden	Wandi ironbark *
Eucalyptus johnstonii Maid.	Tasmanian yellow gum *
Eucalyptus largiflorens F.M	Black box
Eucalyptus longifolia Link	Woollybutt *
Eucalyptus loxophleba Benth	York gum *
Eucalyptus maculata Hook.	Spotted gum
Eucalyptus marginata Donn	Jarrah *
Eucalyptus melliodora Cunn.	Yellow box
Eucalyptus microcarpa (Ma.)	Inland grey box *
Eucalyptus microcorys F.Mu.	Tallow wood
Eucalyptus microtheca F.Mu.	Coolibah
Eucalyptus moluccana Roxb.	Grey box *
Eucalyptus muellerana A.Ho.	Yellow stringybark *
Eucalyptus nesophila Blakel	Melville Is. bloodwood*
Eucalyptus nigra R. Baker	Queensland stringybark*
Eucalyptus nitens (De & Ma)	Shining gum
Eucalyptus obliqua L'Herit.	Messmate tree
Eucalyptus occidentalis En.	Flat-topped yate
Eucalyptus ochrophloia F.M.	Yapunyah *
Eucalyptus odontocarpa F.M.	Sturt Creek mallee *
Eucalyptus oreades R. Baker	Blue mountains ash *
Eucalyptus oxymitra Blakely	Sharp-crapped mallee *
Eucalyptus paniculata Smith	Grey ironbark

Eucalyptus papuana F. Muell	Ghost gum *
Eucalyptus patens Benth.	W. Austral. blackbutt *
Eucalyptus pauciflora Sieb.	Snow gum *
Eucalyptus pellita F. Muell	Large-fr. red mahogany
Eucalyptus phoenicea F.Muel	Scarlet gum *
Eucalyptus pilularis Smith	Blackbutt *
Eucalyptus planchoniana F.	Needlebark stringybark*
Eucalyptus polyanthemos Sc.	Red box *
Eucalyptus polycarpa F.Muel	Long-fruited bloodwood*
Eucalyptus populnea F.Muell	Poplar box *
Eucalyptus propinqua D.& M.	Small-fruited grey gum
Eucalyptus pulchella Desf.	White peppermint *
Eucalyptus punctata DC.	Grey gum *
Eucalyptus quadrangulata D.	White-topped box *
Eucalyptus radiata ssp. rad	Narrow-l. peppermint *
Eucalyptus regnans F.Muell.	Mountain ash
Eucalyptus resinifera Smith	Red mahogany
Eucalyptus robusta Smith	Swamp mahogany
Eucalyptus rudis Endl.	Swamp gum *
Eucalyptus saligna Smith	Sydney blue gum
Eucalyptus salmonophloia F.	Salmon gum
Eucalyptus salubris F.Muell	Gimlet *
Eucalyptus sargentii Maiden	Salt river mallett
Eucalyptus sideroxylon Cun.	Red ironbark (siderox.)
Eucalyptus sideroxylon Cun.	Red ironbark (tricarp)
Eucalyptus sideroxylon Cun.	Red ironbark (tricarp)
Eucalyptus sieberi L.Johns.	Silvertop Ash
Eucalyptus socialis F. Mue.	Red mallee *
Eucalyptus st.-johnii	St. John's gum
Eucalyptus subcrenulata Ma.	Tasman.alp.yellow gum *
Eucalyptus tereticornis Sm.	Forest red gum
Eucalyptus tessellaris F.M.	Carbeen *
Eucalyptus tetrodonta F.Mu.	Darwin stringybark *
Eucalyptus thozetiana F.Mu.	Mountain yapunyah *
Eucalyptus torelliana F. M.	Cadaga
Eucalyptus transcontiental.	Redwood *
Eucalyptus trivalvis Blake.	Vitoria Spring mallee *
Eucalyptus umbra ssp carnea	Bro.-l. white mahogany*
Eucalyptus umbra ssp umbra	Bro.-l. white mahogany*
Eucalyptus urophylla S.T.B.	Ampupu
Eucalyptus viminalis Labill	Manna gum
Eucalyptus wandoo Blakely	Wandoo *
Eucryphia lucida (Labill.)	Leatherwood *
Eugenia aromatica Kuntze	Clove *
Eugenia cumini (L.) Druce	Java plum
Eugenia dombeyi (S.) Skeels	Grumichama *
Eugenia gustavioides Bailey	Grey satinash *
Eugenia jambos L.	Rose-apple
Eugenia javanica Lamk.	Java apple *
Eugenia malaccensis L.	Pomerac
Eugenia suborbiculare (Be.)	Forest satinash
Eugenia uniflora L.	Brazil cherry *
Eugenia uvalha Camb.	Uvalha
Euphorbia tirucalli L.	Rubberhedge euphorbia *
Eusideroxylon zwageri Teij.	Ulin ironwood *
Euterpe chaunostachys Burr.	Palmiche *
Euterpe edulis Mart.	Euterpe edulis *
Euterpe oleracea Martius	Acai *
Exoecaria agallocha L.	Blinding tree *
Exotheca abyssinica (A.R.)	Exotheca *
Fagopyrum emarginatum	Fagopyrum emarginatum *
Fagopyrum esculentum Moench	Common buckwheat *

Fagopyrum tataricum	Tartary buckwheat *
Fagraea fragrans Roxb.	Tembusu *
Fagus grandifolia	American beech *
Fagus sylvatica L.	European beech
Feijoa sellowiana O. Berg	Feijoa
Festuca arundinacea Schreb.	Tall fescue *
Festuca idahoensis Elmer	Idaho fescue *
Festuca longifolia Thuill.	Hard fescue *
Festuca ovina L.	Sheep fescue *
Festuca pratensis Huds.	Meadow fescue
Festuca rubra L v commutata	Chewing's red fescue
Festuca rubra L. v. rubra	Red Fescue
Fibraurea tinctoria Lour.	Areuy gember *
Ficus benghalensis L.	Banyan *
Ficus carica L.	Common fig *
Ficus elastica Roxb.	India rubber fig *
Ficus macrophylla Desf.	Moreton Bay fig *
Ficus subcordata Blume	Bunut lengis *
Ficus vogelii (Miq.) Miq.	Vogel fig *
Flacourtia indica (Burm.f.)	Governors plum
Flemingia macrophylla Blum.	Malabalatong *
Flindersia bourjotiana F.M.	Queensland silver ash *
Flindersia brayleyana F.Mu.	Queensland maple *
Flindersia pimenteliana F.M	Maple silkwood *
Foeniculum vulgare Mill.	Fennel *
Fortunella hindsii (C.) Sw.	Hong Kong wild kumquat*
Fortunella japonica (T.) S.	Round kumquat *
Fortunella margarita (L) S.	Oval kumquat *
Fragaria chiloensis L. Duch	Chilean strawberry *
Fragaria vesca L.	European strawberry *
Fragaria virginiana Duch.	Virginia strawberry *
Fragaria x ananassa (D.) G.	Garden strawberry
Frangula alnus Mill.	Buckthorn *
Furcraea gigantea v. wille.	Mauritius hemp *
Garcinia dulcis (Roxb) Kurz	Mundu *
Garcinia mangostana L.	Mangosteen
Garcinia multiflora Champ.	Bira tai *
Garcinia xanthochymus Hook.	Asam kandis *
Garuga pinnata Roxb.	Gendeli poma *
Geissois benthamiana F.Muel	Red carabeen *
Gelidiella acerosa (Forss.)	Intip-intip *
Genipa americana L.	Genipa
Genista tinctoria L.	Dyer's-greenwood *
Gleditsia triacanthos L.	Honey-locust
Gliricidia sepium (Jacq.) K	Mother of cocoa *
Gluta travancorica Bedd.	Tinne-red *
Glycine max (L.) Merrill	Soyabean
Glycine wightii Arn.	Perennial soybean
Glycyrrhiza glabra L.	Common licorice *
Glycyrrhiza lepidota Pursh	American licorice *
Gmelina arborea Roxb.	Yemane *
Gmelina leichhardtii (F.M.)	White beech *
Gossypium arboreum L.	Tree cotton
Gossypium barbadense L.	American pima cotton
Gossypium herbaceum L.	Levant cotton
Gossypium hirsutum L.	Cotton, American upland
Gracilaria tenuistipitata	Gracilaria *
Gracilaria verrucosa	Gracilaria *
Grevillea parallella J.Kni.	Silver oak *
Grevillea robusta A.Cunn.	Silky oak *
Grewia asiatica L.	Phalsa *
Grewia tiliifolia Vahl.	Dhaman *

Guazuma ulmifolia Lam.	Guacima *
Guizotia abyssinica Cass.	Niger seed (Ethiopian)
Guizotia abyssinica Cass.	Niger-seed (Indian)
Hagenia abyssinica (Bruce)	Cusso *
Haloxylon aphyllum (Minkw.)	Black saxaul *
Hardwickia binata Roxb.	Hardwickia *
Hedysarum carnosum Desf.	Sulla rose *
Hedysarum coronarium L.	Spanish sainfoin *
Hedysarum flexuosum L.	Sulla annuel *
Hedysarum pallidum Desf.	Sulla pale *
Hedysarum spinosissimum L.	Sulla epineux *
Helianthus annuus L v macro	Sunflower
Helianthus tuberosus L.	Jerusalem artichoke *
Hemarthria altissima (Poi.)	Limpo grass *
Hemarthria japonica Stapf	Hemarthria japonica *
Heritiera Fomes Buch.	Sundri *
Heritiera littoralis Aiton	Looking-glass tree *
Heteropogon contortus (L.)	Black spear grass
Hevea brasiliensis (Willd.)	Rubber *
Hibiscus cannabinus L.	Kenaf
Hibiscus sabdariffa L.v al.	Roselle (altissima)
Hibiscus sabdariffa L.v sa.	Roselle (sabdariffe)
Hibiscus tiliaceus L.	Mahoe *
Hierochloe odorata L.Beauv.	Hierochloe odorata *
Hieronyma chocoensis Cuatr.	Mascarey *
Hilaria jamesii (Torr.) Be.	Galleta grass *
Hilaria mutica (Buckl.) Be.	Tobosa grass *
Hippophae rhamnoides L.	Sea buckthorn *
Hippophae salicifolia D. D.	Sea buckthorn *
Hopea odorata Roxb.	Thingan *
Hopea parviflora Bedd.	White kongu *
Hopea utilis (Bedd.) Bole	Black kongu *
Hopea wightiana Wall.	Thingam *
Hordeum brevisubulatum (T.)	Hordeum brevisubulatum*
Hordeum bulbosum L.	Bulbous barley *
Hordeum vulgare L.	Barley
Humulus lupulus L.	Hops
Hydnocarpus alpina Wight	Torathi *
Hydnocarpus kurzii (King) W	Chaulmugra *
Hydnocarpus laurifolia (D.)	Chaulmoogra
Hymenachne acutigluma (S.)	Wick grass *
Hymenodictyon excelsum Wall	Bhorsal *
Hyparrhenia hirta (L) Stapf	Tambookie grass
Hyparrhenia rufa (Ness) St.	Jaragua grass *
Hyphaene thebaica L.	Doum palm *
Ilex dipyrena Wall.	Himalayan holly *
Ilex paraguaiensis A. St-H.	Mate *
Imperata cylindrica (L.) R.	Blady grass *
Indigofera arrecta Hochst.	Natal indigo *
Indigofera hirsuta L.	Hairy indigo *
Indigofera spicata Forsk.	Trailing indigo *
Indigofera tinctoria L.	Common indigo *
Inga edulis von Martius	Ice-cream bean *
Inga feuillei de Candolle	Pacay *
Intsia bijuga (Colebr.)O.K.	Borneo teak *
Ipomoea aquatica For. aqua.	Kang kong
Ipomoea batatas (L.) Lam.	Sweet potato
Ischaemum ciliare Retzius	Batiki blue grass
Ischaemum magnum Rendle	Rumput melayu *
Ischaemum muticum L.	Drought grass *
Ischaemum rugosum Salisb.	Wrinkle duck-beak *
Ischaemum timorense Kunth	Centipede grass *

Iseilema laxum Hack.	Machuri *
Iseilema membranaceum (Li.)	Flinders grass *
Ixophorus unisetus (Presl)	Mexican grass *
Jacaranda copaia (Aubl.) D.	Futui
Jacaranda mimosifolia D.Don	Jacaranda *
Jessenia bataua (Mart.) Bu.	Pataua *
Juglans hindsii Jeps.	California b. walnut *
Juglans nigra L.	Black walnut *
Juglans regia L.	English walnut *
Juglans sieboldiana	Heartnut *
Juniperus procera Hochst.	African pencil cedar *
Kerstingiella geocarpa Har.	Hausa groundnut *
Khaya senegalensis (Desr.)	African mahogani *
Koeleria cristata Griseb.	Koeleria cristata *
Lablab purpureus Medik.	Hyacinth bean
Lactuca indica L.	Indian lettuce *
Lactuca sativa L.	Lettuce
Lagenaria siceraria (M) St.	Bottle gourd *
Lagerstroemia flos-reginae	Jarul *
Lagerstroemia lanceolata W.	Benteak *
Lagerstroemia parviflora R.	Dhaura *
Lagerstroemia tomentosa Pr.	Leza *
Laguncularia racemosa (L.)	White mangrove *
Lannea coromandelica (Hou.)	Wodier *
Lansium domesticum Corr.	Langsat
Lasiurus hirsutus Boiss.	Sewan grass *
Lathyrus cicera L.	Flat-topped vetchling *
Lathyrus hirsutus L.	Rough pea *
Lathyrus ochrus (L.) D.C.	Ochrus vetch *
Lathyrus sativus L.	Grass pea *
Laurus nobilis L.	Sweet bay *
Lavandula angustifolia Mill	True lavender *
Lavandula dentata	French lavender *
Lavandula intermedia Emeri.	Hybrid lavender *
Lavandula latifolia (L.f.)	Spike lavender
Lawsonia inermis L.	Henna *
Leersia hexandra Sw.	Swamp rice grass *
Lens culinaris Medikus	Lentil
Lepidium meyenii Walpers	Maca *
Lepidium sativum L.	Garden cress *
Leptochloa fusca (L.) Kunth	Black swamp grass *
Lespedeza cuneata (Dum) G.	Sericea *
Lespedeza stipulacea Maxim.	Korean clover *
Lespedeza striata (Thunb.)	Japanese clover *
Leucaena diversifolia Benth	Leucaena diversifolia *
Leucaena leucocephala (La.)	Leucaena
Levisticum officinale Koch	Lovage *
Licuala ramsayi (F.Muell.)	Wedge leaflet fan palm*
Limnanthes alba	White meadowfoam *
Linum usitatissimum L.	Linseed
Liquidambar styaciflua L.	Bilsted *
Litchi chinensis Sonn.	Lychee
Livistana australis (R. Br.)	Cabbage-tree palm
Lolium multiflorum Lam.	Italien ryegrass
Lolium perenne L.	Perennial reygrass
Lolium rigidum Gaud.	Rigid ryegrass *
Lonchocarpus nicou (Aubl.)	Barbasco *
Lophostemon suaveolens Sol.	Swamp box *
Lotononis bainesii Baker	Lotononis *
Lotus corniculatus L.	Birdsfoot trefoil
Lotus creticus L.	Silvery birdsfoot tref*
Lotus edulis L.	Esculent birdsfoot tre*

Lotus halophilus Boiss.	Pretty birdsfoot trefo*
Lotus tenuis Wald. & Kit.	Narrowleaf trefoil *
Lotus uliginosus Schkuhr	Big trefoil *
Loudetia simplex (Nees) C.	Common russet grass *
Luffa acutangula (L.) Roxb.	Ridged gourd *
Luffa cylindrica (L.) M.J.R	Smooth luffa *
Lumnitzera littorea (Jack)	Lumnitzera
Lumnitzera racemosa Willd.	Kirpa *
Lupinus albus L.	White Lupin
Lupinus angustifolius L.	Blue lupin
Lupinus cosentinii Guss.	Sand plain lupin
Lupinus luteus L.	Yellow Lupin
Lupinus mutabilis Sweet	Tarwi
Lupinus pilosus	Lupinus pilosus *
Lycium chinense Miller	Chinese boxthorn *
Lycopersicon esculentum M.	Tomato
Macadamia tetraphylla	Macademia nut *
Macademia integrifolia M&B.	Macademia nut
Macroptilium atropurpureum	Siratro
Macroptilium lathyroides L.	Phasey bean
Macrotyloma axillare (E.M.)	Perennial horse gram
Macrotyloma uniflorum (Lam)	Horse gram
Maesopsis eminii Engl.	Musizi *
Majorana hortensis (M.)	Sweet marjoram *
Malpighia glabra L.	Barbados cherry
Malus domestica Borkh.	Apple
Malus sylvestris Mill.	Apple
Mammea americana L.	Mammey apple
Mangifera indica L.	Mango
Manihot esculenta Crantz.	Cassava
Manilkara achras (Mill) Fos	Sapodilla
Maranta arundinacea L.	Arrowroot *
Marrubium vulgare L.	Horehound *
Matricaria recutita L.	German camomile *
Mauritia flexuosa L.	Buriti palm *
Medicago arabica (L.) Huds.	Spotted burclover *
Medicago falcata L.	Sickle medick *
Medicago intertexta (L) Mi.	Calvary medic *
Medicago laciniata (L) Mil.	Cut leaf medic *
Medicago littoralis Rhode	Strand medic *
Medicago lupulina L.	Black medic *
Medicago minima (L.) Bart.	Goldfields medic *
Medicago orbicularis (L) B.	Buttonclover *
Medicago polymorpha L.	Burr medic *
Medicago rigidula (L.) All.	Tifton medick *
Medicago rugosa Desr.	Snail clover *
Medicago sativa L.	Alfalfa
Medicago scutellata (L)Mill	Snail medic *
Medicago tornata (L) Mill.	Luzerne escargot *
Medicago truncatula Gaertn.	Aleppo clover *
Medicago turbinata (L.) All	Cogwheel medick *
Medicago varia Martyrn.	Variegated alfalfa *
Melaleuca arcana S.T. Blake	Winti *
Melaleuca bracteata F.Muel.	River tea-tree *
Melaleuca cajuputi Powell.	Swamp tea-tree *
Melaleuca dealbata S.T.Bla.	Blue-leaved paperbark *
Melaleuca lanceolata Otto	Moonah *
Melaleuca leucadendron L.	Long-leaved paperbark *
Melaleuca nervosa (Lindley)	Yellow-bark. paperbark*
Melaleuca quinquenervia (C)	Fine-veined paperbark *
Melaleuca symphyocarpa F.M.	Liniment tree *
Melaleuca viridiflora Sol.	Broad-leaved paperbark*

Melia azedarach L.	Chinaberry *
Melia azedarach v austral.	White cedar *
Melia compostia Willd.	Malabar neem wood *
Melicoccus bijugatus Jacq.	Spanish lime *
Melilotus alba Medik.	White sweetclover
Melilotus indica (L.) All.	Indian melilot *
Melilotus officinalis Lam.	Yellow sweetclover
Melilotus suaveolens Ledeb.	Sweet clover *
Melinis minutiflora Beauv.	Molasses grass
Melissa officinalis L.	Sweet balm *
Melocalamus compactiflorus	Melocalamus *
Melocanna baccifera (Roxb.)	Melocanna *
Mentha arvensis v piperasc.	Corn mint *
Mentha pulegium L.	European pennyroyal *
Mentha rotundifolia (L)Huds	Applemint *
Mentha spicata L. v. crispa	Spearmint *
Mentha x piperita L.	Peppermint
Mesua ferrea L.	Mesua *
Metroxylon sagu Rottboell	Sago palm
Michelia champaca L.	Champac *
Michelia doltsopa Buch. Ha.	Champ *
Microstegium ciliatum (T.)	Banyonan tembaga *
Mikania cordata (B.) B.L.R.	Mile-a-minute *
Miliusa velutina (Dunal) H.	Bari-kai *
Mimosa pudica L.	Sensitive plant *
Mirabillis expansa Ruiz & P	Mauka *
Momordica charantia L.	Bitter gourd *
Momordica cochinchinensis	Sweet gourd *
Monochoria hastata (L.) S.	Hastate-leaved p.weed *
Monochoria vaginalis (N.L.)	Oval-leaved pondweed *
Monstera deliciosa Liebm.	Monstera
Morinda citrifolia L.	Indian mulberry *
Moringa oleifera Lam.	Benoil tree
Morus alba L.	White mulberry
Morus nigra L.	Black mulberry
Morus rubra L.	Red mulberry *
Mucuna pruriens (L.) DC.	Velvet bean *
Muntingia calabura L.	Jamaica cherry *
Murraya koenigii (L.) Spre.	Curryleaf tree
Musa acuminata Colla	Banana
Musa acuminata x M. balbis.	Banana
Musa balbisiana Colla	Plantain bananas
Musa halabanensis Meijer	Banana *
Musa salaccensis Zoll.	Banana *
Musa textilis Nee	Abaca *
Musanga cecropioides R.Br.	Umbrella tree *
Myrciaria cauliflora (Mart)	Jaboticabas *
Myristica fragrans Houtt.	Nutmeg
Myroxylon balsamum (L) Har.	Tulo balsam *
Myroxylon balsamum v perei.	Peru balsam *
Myrsine africana L.	Kurjan seed *
Myrtus communis L.	Myrtle *
Nasturtium officinale R.Br.	Watercress
Nasturtium schlechteri O.E	Highland cress *
Nauclea diderrichii (De W.)	Opepe *
Nauclea orientalis (L.) L.	Cheesewood *
Nelumbo nucifera Gaertn.	Sacred lotus
Neofabricia myrtifolia (G.)	Neofabricia myrtifolia*
Neoglazovia varigata Mez.	Caroa fibre *
Neohouzeaua dullooa (Gram.)	Neohouzeaua *
Nepeta cataria L.	Catnip *
Nephelium lappaceum L.	Rambutan

Nephelium mutabile Bl.	Pulasan *
Neptunia prostrata (Lamk) B	Water mimosa *
Nicotiana rustica L.	Nicotine tobacco
Nicotiana spp	Burley tobacco
Nicotiana spp	Oriental tobacco *
Nicotiana tabacum L.	Tobacco
Nigella sativa L.	Black cumin *
Nothofagus cunninghamii (H)	Myrtle *
Nothofagus moorei (F.Muell)	Negrohead beech *
Nypa fruticans Wurmb.	Nipa palm
Ochroma pyramidale (Cav.)	Balsa *
Ocimum americanum L.	Hoary basil *
Ocimum basilicum L.	Basil *
Octomeles sumatrana Miq.	Binuang *
Oenanthe javanica (Bl.) DC.	Oenanthe *
Olea africana Miller	Wild olive *
Olea cuspidata Wall.	Indian olive *
Olea europaea L.	Olive, Europaen
Oncosperma tigillarium (J.)	Nibong *
Onobrychis scrobiculata Bo.	Onobrychis scrobiculata
Onobrychis viciifolia Scop.	Sainfoin *
Opunita ficus-indica (L.) M	Indianfig *
Orbignya cohume (Mart.) Da.	Cohume palm *
Orbignya martiana Bard&Rodr	Babacu palm *
Orbignya oleifera Burret	Babacu palm *
Origanum creticum L.	Pot marjoram *
Origanum vulgare L.	Oregano *
Ornithopus roseus Dufour	Serradella *
Oryza glaberrima Steud.	African rice *
Oryza sativa L. s. indica	Rice upland (Indica)
Oryza sativa L. s. indica	Rice, paddy (Indica)
Oryza sativa L. s. japonica	Rice paddy (Japonica)
Oryza sativa L. s. japonica	Rice upland (Japonica)
Oryza sativa s. javanica	Bulu rice (Javanica)
Oryzopsis holciformis (M.B)	Ricegrass *
Oryzopsis miliacea (L.) As.	Smilograss *
Oxalis tuberosa Molina	Oca *
Oxytenanthera nigrociliata	Kalia *
Pachyrrhizus ahipa (Wed.)P.	Ahipa *
Pachyrrhizus erosus L Urban	Yam bean *
Pachyrrhizus tuberosus (L.)	Potato bean *
Palaquium gutta (Hook)Burck	Gutta percha *
Panax quinquefolium L.	American ginseng *
Pandanus julianettii Martel	Karuka *
Panicum antidotale Retz.	Blue panic *
Panicum coloratum L.	Coloured Guinea grass *
Panicum coloratum L. v mak.	Makarikari grass *
Panicum maximum Jacq.	Guinea grass
Panicum maximum Jacq. v tr.	Green panic *
Panicum miliaceum L.	Millet, common
Panicum obtusum	Vine mesquite *
Panicum repens L.	Torpedo grass *
Panicum sumatrense Roth ex	Little millet *
Panicum turgidum Forsk.	Turgid panic grass *
Panicum virgatum L.	Switchgrass *
Panicum whitei J.B. Black	Pepper grass *
Papaver bracteatum Lindl.	Scarlet poppy *
Papaver somniferum L.	Opium poppy
Parinari nonda F. Muell.	Nonda-tree *
Parkia biglobosa (Jacq.) B.	Locust bean tree *
Parkinsonia aculeata L.	Horse bean tree *
Parthenium argentatum Gray	Guayule *

Paspalum dilatatum Poiret	Dallis grass
Paspalum distichum L.	Salt-water couch *
Paspalum notatum Fluegge	Bahia grass
Paspalum plicatulum M.v gl.	Plicatulum glabrum *
Paspalum plicatulum Michaux	Plicatulum *
Paspalum scrobiculatum L.	Kodo millet *
Paspalum urvillei Steud.	Vasey grass *
Paspalum wettsteinii Hack.	Broad-leaf paspalum *
Passiflora edulis v edulis	Purple passionfruit *
Passiflora edulis v flavic.	Golden passionfruit
Passiflora laurifolia L.	Water-lemon *
Passiflora ligularis Juss.	Sweet granadilla *
Passiflora mollissima (HBK)	Banana passionfruit
Passiflora quadrangularis L	Giant granadilla
Pastinaca sativa L.	Parsnip
Paullinia cupana H.B.K.	Guarana *
Paulownia tomentosa Steud.	Kiri *
Peltophorum pterocarpum DC	Yellow flame *
Pennisetum clandestinum H.	Kikuyu grass
Pennisetum glaucum (L)R.Br.	Pearl millet
Pennisetum pedicellatum Tr.	Annual kyasuwa grass *
Pennisetum polystachion (L)	Mission grass *
Pennisetum purpureum Schum.	Elephant grass
Pentaclethra macrophylla B.	Oil-bean tree *
Pericopsis elata (Harms) M.	Afrormosia *
Pericopsis mooniana Thwait.	Nandu wood *
Persea americana Mill.	Avocado * (Guatemalan)
Persea americana Mill.	Avocado * (Mexican)
Persea americana Mill.	Avocado * (West Indian)
Persoonia falcata R. Br.	Wild pear *
Petalostigma pubescens Dom.	Quinine tree *
Petroselinum crispum Mill.	Parsley
Phalaris aquatica L.	Bulb canarygrass *
Phalaris arundinacea L.	Reed canarygrass
Phalaris canariensis L.	Canary grass *
Phalaris coerulescens Desf.	Sunolgrass *
Phaseolus acutifolius Gray	Tepary bean
Phaseolus coccineus L.	Scarlet runner bean
Phaseolus lunatus L.	Lima bean
Phaseolus polyanthus Green.	Botil *
Phaseolus vulgaris L.	Bean, common
Phleum pratense L.	Timothy
Phoenix dactylifera L.	Date palm
Phormium tenax Forst.	New Zealand flax *
Phragmites australis (Cav.)	Common reed *
Phragmites communis (L.) T.	Phragmites communis *
Phragmites karka (Retz.) St	Pit-pit *
Phyllanthus emblica L.	Emblic myrobalan *
Phyllocladus aspleniifolius	Celery top pine *
Physalis peruviana L. v ed	Goldenberry
Physalis philadelphica Lam.	Tomatillo *
Picea morida Link.	West Himalayan spruce *
Pimenta dioica (L.) Merr.	Pimento *
Pimenta racemosa (Mill.) J.	Bay tree *
Pimpinella anisum L.	Anise
Pinus ayacahuite Ehrenb.	Mexican white pine *
Pinus ayachuite Ehrenb v Br	Pinus ayachuite *
Pinus brutia Ten.	Brutia pine *
Pinus canariensis C.Sm.	Canary Island pine *
Pinus caribaea, bahamensis	Bahaman pine *
Pinus caribaea, caribaea	Carribean pine *
Pinus caribaea, hondurensis	Honduran pine *

Pinus chiapensis (Martinez)	Pinus chiapensis
Pinus douglasiana Martinez	Pinus douglasiana *
Pinus durangensis Martinez	Pinus durangensis *
Pinus elliottii, elliottii	Slash pine *
Pinus excelsa Wall.	Blue pine *
Pinus gerardiana Wall.	Chilgoza pine *
Pinus greggii Engelm.	Pinus greggii *
Pinus halepensis Mill.	Aleppo pine *
Pinus hartwegii Lindl.	Ocote *
Pinus kesiya Royle ex Gord.	Khasya pine *
Pinus merkusii, continental	Tenasserim pine *
Pinus merkusii, island	Tenasserim pine *
Pinus michoacana F. tumida	Ocote *
Pinus michoacana Martinez	Michoacan pine *
Pinus michoacana v cornuta	Mocochtaj *
Pinus montezumae Lamb.	Montezuma pine *
Pinus occidentalis Swartz	West Indian pine *
Pinus oocarpa Schiede	Pinus oocarpa *
Pinus oocarpa v ochoterenai	Ocote de carretilla *
Pinus palustris Mill.	Longleaf pine *
Pinus patula Schiede & Dep.	Patula pine *
Pinus pinaster Aiton (Port)	Maritime pine *
Pinus pinea L.	Umbrella pine *
Pinus ponderosa Dougl.	Ponderosa pine *
Pinus psedostrobus v oaxac.	Mocochtaj *
Pinus pseudostrobus Lindl.	False Weymouth pine *
Pinus radiata D. Don.	Radiata pine *
Pinus roxburghii Sarg.	Chir pine *
Pinus rudis Endl.	Ocote *
Pinus strobus v. chiapensis	Pinabete *
Pinus sylvestris L.	Scots pine *
Pinus sylvestris v mongoli.	Pinus sylvestris v mon*
Pinus tabulaeformis Carr.	Pinus tabulaeformis *
Pinus taeda L.	Loblolly pine *
Pinus tenuifolia Benth.	Cantaj *
Pinus teocote Schl. & Cham.	Ocote *
Piper betle L.	Betel vine *
Piper methysticum Forst.	Kava *
Piper nigrum L.	Pepper, black or white
Pistacia vera L.	Pistachio nut *
Pisum sativum L.	Pea
Pithecellobium dulce (Rox.)	Kamachile *
Plectranthus esculentus N.E	Livingstone potato *
Poa annua L.	Annual bluegrass
Poa bulbosa L.	Bulbous bluegrass *
Poa compressa L.	Canada bluegrass *
Poa fendleriana (Steud.) V.	Mutton bluegrass *
Poa pratensis L.	Smooth meadow grass
Poa sinaica Steud.	Sinai meadow grass *
Poa trivialis L.	Rough bluegrass *
Podocarpus elatus R. Br.	Brown pine *
Poeciloneuron indicum Bedd.	Ballagi *
Pogostemon cablin (Blanco)	Patchouli *
Polyalthia fragrans (Dalz.)	Debdaru *
Polymnia sonchifolia P.& E.	Yacon
Polyscias verticillata Ston	Valangur *
Populus deltoides Bartr.	Carolina poplar *
Populus euphratica Oliv.	Euphrates poplar *
Populus simonii	Populus simonii *
Portulaca oleracea L.	Purslane *
Portulaca quadrifida L.	Purslane, Single-flow.
Pouteria campechiana (H.B.)	Canistel *

Pouteria lucuma	Lucuma
Pouteria sapota (Jacq) H.M.	Sapote *
Prosopis chilensis (Mol.)	Algarrobo blanco *
Prosopis cineraria (L.) Dr.	Jand
Prosopis juliflora (Sw.)DC.	Mesquite *
Prosopis pallida H.B.K.	Algaroba *
Prosopis spicigera L.	Jand *
Prosopis tamarugo F. Phil.	Tamarugo *
Prosopis velutina Wooton	Prosopis velutina *
Prunus amygdalus Batsch.	Almond
Prunus armeniaca L.	Apricot
Prunus avium L.	Cherry, Sweet
Prunus cerasus L.	Cherry, Sour
Prunus domestica L.	Plum
Prunus mume Siebold & Zucc.	Apricot, Japanese *
Prunus persica (L.) Batsch	Peach
Prunus salicina Lindley	Plum, Japanese *
Psathyrostachys juncea (F.)	Wildrye, Russian
Psidium cattleianum Sabine	Guava, Strawberry *
Psidium friedrichsthalianum	Guava, Costa Rican *
Psidium guajava L.	Guava
Psophocarpus tetragonolobus	Bean, Winged
Psoralea patens Lindl.	Bullamon lucerne *
Pterocarpus dalbergioides R	Andaman redwood *
Pterocarpus erinaceus Poir.	Senegal rosewood *
Pterocarpus indicus Willd.	Malay padauk *
Pterocarpus macrocarpus Ku.	Burma padauk *
Pterocarpus marsupium Roxb.	Kino tree *
Pterocarpus santalinus L.f.	Red sandalwood *
Puccinellia tenuiflora (S.)	Puccinellia tenuiflora*
Pueraria lobata (Willd.) O.	Kudzu *
Pueraria phaseoloides (R.)	Tropical kudzu
Punica granatum L.	Pomegranate *
Pyrus communis L.	Pear
Pyrus pyrifolia (Burm. f.)	Sand pear *
Quercus dilatata Lindl.	Green oak *
Quercus ilex L.	Holm oak *
Quercus incana Roxb.	Grey oak *
Quercus lamellosa Smith	Buk oak *
Quercus lanuginosa Don.	Woolly oak *
Quercus lineata Blume	Pasang batu *
Quercus semecarpifolia Smi.	Brown oak *
Quercus suber L.	Cork oak
Quercus virginiana	Virginia live oak *
Raphanus sativus L. (C.R.)	Radish, Chinese *
Raphanus sativus L. (L.R.)	Radish, Leaf *
Raphanus sativus L. (R.R.)	Radish, Rat-tailed *
Raphanus sativus L. (S.R.)	Radish, Western
Raphia hookeri Mann.& Wendl	Wine palm *
Rauwolfia serpentina Benth.	Java devil pepper *
Rheum rhaponticum L.	Garden rhubarb *
Rhizophora mangle L.	Red mangrove *
Rhizophora mucronata Lam.	Asiatic mangrove *
Rhizophora stylosa Griffith	Small-stilted mangrove*
Rhynchosia minima (L.) DC	Rhynchosia *
Ribes hirtellum	Hairy gooseberry *
Ribes nigrum L.	Black currant *
Ribes rubrum	Red currant *
Ribes sativum	Common red ribes *
Ribes uva-crispa L.	European gooseberry
Ricinus communis L.	Castor
Robinia pseudoacacia L.	False acacia *

Roseodendron donn.-smithii	Primavera *
Rosmarinus officinalis L.	Rosemary
Rubus idaeus L.	Red raspberry
Rubus occidentalis L.	Black raspberry *
Rubus occidentalis x idaeus	Purple raspberry *
Rubus spp	Blackberry *
Rubus spp	Dewberries *
Rumex crispus L.	Rumex crispus *
Rumex obtusifolius L.	Lengua de vaca *
Rungia klossii S. Moore	Rungia
Ruta graveolens L. v. brac.	Common rue
Saccharum barberi Jesweit	Indian cane
Saccharum edule Hassk.	Pitpit *
Saccharum officinarum L.	Sugarcane
Saccharum robustum Brandes	Sugarcane
Saccharum sinense Roxb.	Japanese cane
Saccharum spontaneum L.	Wild cane
Sageraea elliptica Hook. f.	Andaman bow-wood *
Sagittaria sagittifolia L.	Arrowhead *
Salacca wallichiana C. Mar.	Rakum palm *
Salacca zalacca (Gaertner)	Salak palm *
Salix babylonica L.v.sacra.	Sauce americano *
Salix flavida Chang & Skv.	Salix flavida *
Salvia officinalis L.	Sage *
Salvia sclarea L.	Clary sage *
Samanea saman Merrill	Raintree *
Sambucus canadensis L.	Eastern elderberry *
Sambucus cerulea Nutt.	Western elderberry *
Sanguisorba minor	Burnet *
Sansevieria guineensis (L)	Bowstring hemp *
Santalum acuminatum	Quandong *
Santalum album L.	Indian sandalwood *
Santalum spicatum (R.Br)DC.	Sandalwood
Sapindus emarginatus Vahl.	Ritha *
Sapium sebiferum (L.) Roxb.	Chinese tallow tree *
Satureia hortensis L.	Summer savory *
Satureia montana L.	Winter savory *
Sauropus androgynus Merrill	Star gooseberry
Schinus molle L.	Pepper tree *
Schizolobium parahybum (V.)	Brazilian fire tree *
Schizomeria ovata D. Don.	Crabapple *
Schleichera oleosa (Lour.)	Lac-tree *
Sclerocarya caffra Sond.	Morula *
Secale cereale L.	Rye
Secale montanum Guss.	Mountain rye *
Sechium edule (Jacq) Swartz	Choyote
Sehima nervosum (Willd.) S.	Rat's tail grass
Sesamum indicum L.	Sesame seed
Sesbania bispinosa (Jacq.)	Danicha *
Sesbania cannabia (Retz.) P	Sesbania cannabia *
Sesbania exaltata (Raf.) R.	Colorado river hemp *
Sesbania formosa (F.Muell.)	Swamp corkwood *
Sesbania grandiflora (L.)P.	Agati *
Sesbania macrantha v levis	Sesbania macrantha *
Sesbania macrantha v macra.	Sesbania macrantha *
Sesbania pachycarpa	Sesbania pachycarpa *
Sesbania sesban (L.)Merrill	Egyptian rattle pod *
Setaria italica (L.) Beauv.	Italian millet *
Setaria sphacelata 'Kazun.'	Golden timothy *
Setaria sphacelata 'Nandi'	Golden timothy *
Setaria sphacelata 'Narok'	Golden timothy *
Shorea assamica Dyer.	Makai *

Shorea robusta Gaertn. f.	Sal *
Shorea talura Roxb.	Lac tree *
Shorea tumbuggaia Roxb.	Green dammar tree *
Simmondsia chinensis Link.	Jojoba
Sinapis alba L.	White mustard
Sloanea woollsii F. Muell.	Yellow carabeen *
Solanum ferox L.	Tarong pasai *
Solanum hyporhodium A.Br.&B	Cocona *
Solanum incanum L.	Sodum apple
Solanum instrusum	Sunberry
Solanum macrocarpon L.	Eggplant, African
Solanum melongena L.	Eggplant
Solanum muricatum Ait.	Melon pear
Solanum nigrum L.	Black nightshade *
Solanum quitoense Lamarck	Naranjilla
Solanum torvum Swartz	Plate bush *
Solanum tuberosum L.	Potato
Solanum x juzepczukii	Bitter potato *
Solenostemon rotundifolius	Hausa poptato *
Sonneratia apetala Ham.	Keora *
Sonneratia caseolaris (L.)	Crabapple mangrove *
Sorghum bicolor (L.) Moench	Sorghum (high altitude)
Sorghum bicolor (L.) Moench	Sorghum (low altitude)
Sorghum bicolor (L.) Moench	Sorghum (med. altitude)
Sorghum halepense (L.) Pers	Johnson grass *
Sorghum x almum Parodi	Columbus grass
Sorghum x drummondii (S.)	Sudan grass
Soymida febrifuga A. Juss.	Indian red wood *
Spartium junceum L.	Spanish broom *
Sphenostylis stenocarpa (H)	African yam bean *
Spinacia oleracea L.	Spinach
Spodiopongo sibiricus Trin	Spodiopongo sibiricus *
Spondias cytherea Sonn.	Ambarella
Spondias mombin L.	Hog plum *
Spondias purpurea L.	Red mombin
Sporobolus airoides Torr.	Alkali sacaton *
Stachys affinis Bunge	Chinese artichoke *
Stenotaphrum secundatum (W)	St Augustine grass *
Stephegyne parvifolia Korth	Kaem *
Sterculia campanulata Wall	Papita *
Sterculia urens Roxb.	Karaya gum *
Sterculia villosa Roxb.	Udal *
Sterospermum suaveolens DC.	Padal *
Stevia rebaudiana (Bertoni)	Stevia *
Stipa barbata Desf.	Needler grass *
Stipa lagascae Roem.&Schult	Feather grass *
Stipa parviflora Desf.	Feather grass small-f.*
Stipa tenacissima L.	Esparto *
Stripa baicalensis Roshev	Stripa baicalensis *
Stripa breviflora Griseb.	Stripa breviflora *
Stripa capillata L.	Stripa capillata
Stripa glareosa Smirn.	Stripa glareosa *
Stripa gobica Roshev.	Stripa gobica *
Stripa grandis Smirn.	Stripa grandis *
Stripa Krylovii Roshev.	Stripa Krylovii *
Stylosanthes capitata Vogel	Stylosanthes *
Stylosanthes erecta Beauv.	Nigerian stylo *
Stylosanthes guianensis gui	Brazilian lucerne
Stylosanthes guianensis int	Fine stem stylo *
Stylosanthes hamata (L.) T.	Carribean stylo
Stylosanthes humilis H.B.K.	Townsville lucerne
Stylosanthes macrocephala	Stylosanthes macro. *

Stylosanthes scabra Vogel	Shrubby stylo *
Swietenia macrophylla King	Large-leaved mahogany *
Swietenia mahagoni (L) Jacq	Small-leaved mahogany *
Syncarpia glomulifera (Sm.)	Turpentine *
Syncarpia hillii Bailey.	Satinay *
Tabebuia rosea (Bertol.)DC.	Mayflower *
Talinum triangulare (Jacq.)	Waterleaf *
Tamarindus indica L.	Tamarind
Tamarix aphylla (L.) Karst.	Tamarisk *
Tamarix chinensis Lour.	Tamarisk (Chinese) *
Taraxacum officinale Weber	Dandelion *
Tarchonanthus camphoratus L	Camphor bush *
Taxodium distichum (L) Rich	Swamp cypress *
Tectona grandis L.f.	Teak *
Telfairia occidentalis H.f.	Fluted pumpkin *
Telfairia pendata (S.ex S.)	Oyster nut *
Tephrosia candida (Roxb.)DC	White tephrosia *
Tephrosia vogelii Hook. f.	Fishbean *
Terminalia arjuna (Roxb.) W	Arjuna *
Terminalia arostrata Ewart	Nutwood *
Terminalia belerica Roxb.	Bahera *
Terminalia brassii Exell	Swamp oak *
Terminalia calamansanai R.	Kwako *
Terminalia catappa L.	Indian almond *
Terminalia chebula Retz.	Chebulic myrobalan *
Terminalia ivorensis A.Chev	Idigbo *
Terminalia myriocarpa Heur.	Panisaj *
Terminalia paniculata Roth.	Kindal *
Terminalia sericocarpa F.M.	Damson *
Terminalia superba Engl.&D.	Afara *
Terminalia tomentosa W.& A.	Sain *
Terminalia volucris R. Br.	Rosewood *
Tetragonia tetragonioides P	New Zealand spinach *
Thaumatococcus daniellii B.	Miracle-fruit *
Themeda australis (R.Br.) S	Kangaroo grass *
Themeda quadrivalis (L.) K.	Habana oat grass *
Themeda triandra Forsk.	Red oat grass *
Theobroma bicolor Humb. et	Cacao blanco *
Theobroma cacao L.	Cacao
Theobroma grandiflorum (Sp)	Brazilian cacao *
Thymus serpyllum L.	Wild thyme *
Thymus vulgaris L.	Thyme *
Thyrsostachys siamensis Ga.	Tiyowa *
Toona australis (F. Muell.)	Red cedar *
Toona ciliata M.J. Roem	Toona *
Toona serrata (Roxb.) M.Ro.	Hill toon *
Trachyspermum ammi (L.) Sp.	Ammi *
Tragopogon porrifolius L.	Salsify *
Trema orientalis (L.) Blume	Charcoal tree
Trewia nudiflora L	Pitali *
Trichosanthes cucumerina L.	Snake gourd *
Trifolium agrarium L.	Hop clover *
Trifolium alexandrinum L.	Egyptian clover *
Trifolium ambiguum Bieb.	Kura clover *
Trifolium arvense L.	Rabbitfoot clover *
Trifolium campestre Schreb.	Large hop clover *
Trifolium cherlei L.	Cupped clover *
Trifolium dubium Sibth.	Small hope clover *
Trifolium fragiferum L.	Strawberry clover *
Trifolium hirtum All.	Rose clover *
Trifolium hybridum L.	Alsike clover
Trifolium incarnatum L.	Crimson clover *

Trifolium medium L.	Zigzag clover *
Trifolium nigrescens Viv.	Ball clover *
Trifolium pilulare Boiss.	Trifolium pilulare *
Trifolium pratense L.	Red clover
Trifolium repens L.	White clover
Trifolium resupinatum L.	Persian clover *
Trifolium semipilosum Fres.	Kenya white clover *
Trifolium subterraneum L.	Subterranean clover *
Trifolium tomentosum	Wolly trefoil *
Trifolium variegatum Nutt.	Whitetip clover *
Trifolium vesiculosum Savi	Arrowleaf clover *
Trigonella foenum-graecum L	Fenugreek
Triplochiton scleroxylon K.	African white wood *
Tripsacum andersonii J.R.G.	Guatemala grass *
Tristania conferta R.Br.	Brush box *
Triticum aestivum L.	Wheat, common
Triticum compactum Host	Wheat, club *
Triticum diococcon Schrank	Emmer *
Triticum durum Desf.	Wheat, durum *
Triticum spelta L.	Spelt *
Uapaca kirkiana Muell.-Arg.	Masuku *
Ullucus tuberosus Caldas	Ullucu *
Uncaria gambir (Hunter) Ro.	Gambier *
Urena lobata L.	Urena *
Urochloa mosambicensis (H.)	Sabi grass
Urochloa oligotricha (Fig.)	Dubi grass *
Urochloa panicoides Beauv.	Liverseed grass *
Vaccinium angustifolium Ait	Lowbush blueberry
Vaccinium corymbosum L.	Highbush blueberry
Vaccinium macrocarpon Ait.	Cranberry
Valeriana officinals L.	Valerian *
Vanilla planifolia Andrews	Vanilla *
Vateria indica L.	White Dhup *
Ventilago viminalis Hook	Supplejack *
Ventilago viminalis Hook	Supplejack *
Vetiveria zizanioides (L.)	Vetiver grass
Vicia benghalensis L.	Purple vetch *
Vicia ervilia (L.) Willd.	Bitter vetch *
Vicia faba L.	Broad bean
Vicia monantha Retz.	Bard vetch *
Vicia narbonensis L.	Narbonne vetch *
Vicia pannonica Crantz	Hungarian vetch *
Vicia sativa L. s. nigra	Blackpod vetch *
Vicia sativa L. s. sativa	Common vetch *
Vicia villosa Roth	Woolypod vetch
Vicia villosa Roth. s dasy.	Cardyne vetch *
Vigna aconitifolia (Jacq.)	Moth bean
Vigna angularis (Willd.) O.	Adzuki bean
Vigna hosei (Craib) Back.	Vigna hosei *
Vigna luteola (Jacq.) Benth	Dalrymple vigna *
Vigna mungo (L.) Hepper	Urd bean
Vigna parkeri Baker	Creeping vigna *
Vigna radiata (L.) Wilczek	Mung Bean
Vigna umbellata (Thunb.)	Rice bean *
Vigna unguiculata bliflo. L	Sowpea *
Vigna unguiculata sesqui. L	Asparagus bean
Vigna unguiculata unguic. L	Cowpea
Vigna vexillata (L.) A.Rich	Zombi pea *
Vitex parviflora A. Juss.	Molave *
Vitis labrusca L.	Fox grape *
Vitis rotundifolia Michx.	Muscadine grape *
Vitis vinifera L.	European wine grape

Voandzeia subterranea (L)T.	Bambara groundnut *
Wrightia tomentosa Roem.&Sc	Dudhi *
Xanthosoma brasiliense Engl	Beleme *
Xanthosoma sagittifolium L.	Tannia
Xylia dolabriformis Benth.	Ironwood of burma *
Xylia xylocarpa Roxb.	Jamba *
Xylocarpus granatum König	Pinle on *
Xylocarpus mekongensis Pie.	Pussur *
Xylocarpus moluccensis (L.)	Nyiri batu *
Yucca elephantipes Regel.	Itabo *
Zea mays L. s. mays	Maize
Zea mays v. amylacea Sturt	Soft maize
Zea mays v. ceratina Kulash	Waxy maize
Zea mays v. everta Sturt	Pop maize
Zea mays v. indentata Sturt	Dent maize
Zea mays v. indurata Sturt	Flint maize
Zea mays v. tunicata Sturt	Pod maize
Zea mays v.saccharata Sturt	Sweet Corn
Zea mexicana (Schard.) Ree.	Teosinte
Zingiber officinale Rosc.	Ginger
Ziziphus mauritianus Lamk.	Indian jujube
Zizyphus spina-christi (L.)	Christ-thorn *
Zostera marina	Eelgrass
Zoysia matrella (L) Merrill	Manila grass *

APPENDIX 2
CONVERSION UNITS

Conversion of units

PlantGro has been designed to give users as little trouble as possible over units, but there may be times when you acquire data which do not use the units employed in this package. Figure A1 gives you help with possible problems. If you have to get conversions from other people, write them into the Figure in the same style.

TO CONVERT	A	to	B	let
Length	feet		metres	B = A * 0.30
	yards		metres	B = A * 0.91
	knots		kmetres	B = A * 1.8
Salinity	mmhos/cm		dS/m	B = A
	mS/cm		dS/m	B = A
Solar	calories		joules (J)	B = A * 4.2
radiation	ergs		joules (J)	$B = A / 10^7$
	joules		Mega-joules	$B = A / 10^6$
	$kilocalories/cm^2$		(MJ)	B = A * 42
	kilowatt hours		MJ/m^2	$B = A * 3.6 *$
	(kWh)		joules (J)	10^6
	$Watt-hours/cm^2$		MJ/m^2	B = A * 36
Temperature	Fahrenheit		Celsius	B = (A-32) * (5/9)
Wind speed	metres/sec		km/hr	B = A * 3.6

Conversion of units (factors have been rounded to two significant figures for PlantGro purposes).

APPENDIX 3 GLOSSARY

This glossary deals with terms used in the handbook, in data-files, and in output from programs.

A

    Refers to soil layer A, i.e. the upper of the two soil layers recognised by PlantGro. It is usually considered to be the organic layer, and files for degraded soils may only have a B layer.

Aeration

    Availability of oxygen to the root system is mostly associated with the size of soil pores and the proportion of pores filled with water. PlantGro deals with soil aeration classes. More detailed prediction systems use formal scientific units for aeration.

AET(mm)

    Actual evapo-transpiration as opposed to the potential. See PET.

Available water capacity (AWC)

    This is generally regarded as the amount of water retained by a well watered soil after complete drainage. It is assumed for practical purposes to be the water available to plants, though plants can obviously withdraw water from rivers and swamps. In PlantGro, AWCA and AWCB indicate absolute values of AWC for soil layers A and B—e.g. 50 mm. Where AWCA% or AWCB% are used, the values quoted are proportional—e.g. AWCA% = 10 means that the AWC of a soil is equivalent to 10% of the soil depth.

AWCA, AWCB, AWCA%, AWCB%

    See available water capacity

B

    Stands for the B layer or mineral layer in a soil profile. In some cases, the A layer or organic layer may be absent.

Base saturation

    This is expressed as a percentage of cation exchange capacity (CEC) and indicates the proportion of exchangeable positive ions in the soil which are of value for plant growth. Very favourable values are c.70%. Very unfavourable values are c.15%.

Brief cold

    Relates to snap cold and is taken to be equivalent to the lowest daily minimum temperature likely in a period.

Cation exchange capacity (CEC)
>   A measure of the ability of a soil to retain positive ions such as calcium and potassium against leaching. The units used in PLANTGRO are meq/100g soil (q.v.) CEC estimates usually include positive ions (cations) which are not needed by or are harmful to plants. Base saturation indicates the proportion of CEC which is beneficial to plants. Very favourable values are c.35 meq/100g soil. Unfavourable values are c.8 meq/100g soil.

Common name
>   This is asked for when making plant files. The convention used in the starter set of plant files has been to use a true common name for crops and the scientific name without attribution's for non-crops. This has been done because the common names of most non-crops often have only local meaning.

CRDRDEP (cm)
>   See critical drained depth.

Critical drained depth (CRDRDEP, cm)
>   This is the minimum depth at which the water table must be for there to be no damaging effects of soil waterlogging on a plant.

Daylength
>   In PlantGro, daylength includes civil twilight because plant processes which respond strongly to daylength are sensitive to quite low levels of light.

DEFICIT
>   The water deficit in the soil. In general terms, this is the amount of water needed to bring soil water content up to field capacity.

Depth of soil
>   In PlantGro, this means the depth of soil which would be penetrable by roots, were the roots long enough. Also called overall depth of soil. PlantGro recognises up to two layers of root-penetrable soil and beneath them there can be an infiltration zone which roots can't enter but water can.

Development units (DUs)
>   Development units are calculated in PlantGro by multiplying thermal units (TUs) by DLFACTOR-p.c. The resulting units are used to estimate the length of calendar time a development phase will take. Each plant file contains a total no. of DUs called SUMDU. When the number of DUs accumulated equals or exceeds SUMDU, the phase in question is judged to be completed and the length of growing season (LGS) is recorded. See DLFACTOR, thermal units. and SUMDU.

DLFACTOR
>   This stands for daylength factor (0 to 1) and represents the influence of daylength on a plant's passage through phases of development.

PlantGro uses it in conjunction with thermal units (q.v.). If, for example, the DLFACTOR for a plant is 0.5 in a particular time-period, this will reduce the value of the thermal units by half and therefore slow the advance of the plant in calendar time towards the end of that phase of development. The units produced by multiplying TUs by DLFACTOR are called development units (DUs). (DLFACTOR—p.c. refers to the plant's clock and *does* influence the predictions. DLFACTOR—man. refers to the manager's view of daylength and does not influence predictions.)

Drainable water capacity (DRWC)

This is regarded as the volume of large pores in a soil from which water will freely drain. For practical purposes, DRWC is usually neglected when estimating water available to plants because this water can disappear very quickly. DRWC is, however, very important for determining the level of the water table. In PlantGro, values for DRWC are attributed to soil layers A and B and to the infiltration zone 1. As with AWC (q.v.), DRWC can be described in absolute terms (e.g. DRWCA = 100 mm) or relative terms (e.g. DRWCI% = 30%).

Drained depth (DRDEP, cm)

The estimated depth of soil from which water has drained. If this is less than CRDRDEP, harmful effects of waterlogging may occur.

DRDEP (cm)

See drained depth.

DRWCA, DRWCB, DRWCI, DRWCA%, DRWCB%, DRWCI%

See drainable water capacity.

dS/m

deci-Siemens per metre, i.e. tenths of Siemens per metre. This is the current official unit for measuring forms of soil salinity. Two units used previously in which are numerically equivalent to dS/m are mS/cm and mmhos/cm.

Dummy relationship

These are notional relationships which carry either favourable roughly estimated values when there is no knowledge of what the relationship really is. Use of dummy data is recorded, and the output from PlantGro contains a warning when such relationships have been used.

DUs

See development units

EVAPORATION

In PlantGro this term relates to the loss of water from a meteorological instrument called a pan. Various types of pan have been devised and each has its own characteristics. The type of pan focused on here is called the Class A pan. Loss of water by the

plant/soil system is called evapo-transpiration and is dealt with in the water balance routine (see also water balance).

Extended cold

Relates to enduring cold and is taken to be equivalent to the average of the daily minimum temperature over a period. This is called TMIN.

FAO

Food and Agricultural Organisation of the United Nations.

FLOOD (days)

The x-axis value for the flooding relationship.

GLR

Greatest limitation rating (0 to 9) in a set of limitation ratings. For example, GRO finds the GLR for the soil factors and carries it forward for the assessment across all factors.

Height (m)

This refers to the height of the plant. It is used solely in relation to estimates of cold damage. Reasonably accurate values will appear in plant files for low-growing plants, but arbitrary values often occur for tall plants. This difference is allowed because PlantGro takes no notices of heights above 4 m.

I

Stands for the infiltration zone in a soil profile into which roots can't penetrate but water can. Sometimes the I zone is absent. Sometimes it is very deep. Its presence or absence can greatly affect the degree of soil waterlogging which occurs.

KA to KE (meq/100g)

The five x-axis values for the potassium relationship. KA is pre-set at zero.

LGS

Length of growing season. This is expressed as a number of time-periods, i.e. weeks, tendays, or months according to the time-unit being considered.

Limitation ratings (LR, 0 to 9)

These are the inverse of suitability ratings and indicate the severity of effects of factor-levels on the plant's performance. In terms of % of maximum performance, LR 0 = 100, LR 2 = 75, LR 4 = 50, LR 6 = 25. and LR 8 and LR 9 = 0. LR 8 = slow death, LR 9 = rapid death.

LR

See limitation ratings.

meq/100 g soil

'meq' stands for milli-equivalents, a chemical measure.

MXWST (mm)
>The maximum water storage capacity of the soil. This is affected by the depth of the soil and its texture. Separate values are calculated for the whole soil profile and the part of the profile occupied by roots.

NA to NE (%N)
>The five x-axis values for the nitrogen relationship. NA is pre-set at zero.

NLD (cm)
>See non-limiting rooting depth.

Non-limiting rooting depth (NLD, cm)
>The minimum depth of soil the plant requires for root/shoot relationships to operate properly.

Notional relationship
>Semi-quantitative representation of the effect of a factor on plant performance. See Figure 2.

OPTDU
>The number of development units (q.v.) considered to be optimal for rate of development. The permitted maximum is 70 per week. OPTDU appears to fall commonly between 50 and 55. When development units in a prediction exceed OPTDU, a penalty is imposed because it is assumed that the plant will be producing organs faster than it can fill them out.

OVLR
>Overall limitation rating (0 to 9) for a phase of development. It is based on the lethal limitation if there is such or on the average of the limitations.

PA to PE (ppm, available, Olsen)
>The five x-axis values for the phosphorus relationship. PA is pre-set at zero.

PET (mm)
>Potential evapo-transpiration assuming sufficient water is available. See AET.

PETCF (approx. 0.2 to 1.3)
>This coefficient indicates the degree to which evapo-transpiration from a plant/soil system is likely to differ from the evaporative loss from a Class A pan (see evaporation). Values for almost bare soils can be as low as 0.2. Very wet heavily vegetated plant/soil systems can have values of 1.1 to 1.3. PETCF is the equivalent to the 'crop factor' in FAO's water balance routines. PlantGro gives on-screen help in choosing values for PETCF. PETCF is then stored in the plant file under water availability.

pH
The standard measure of acidity and alkalinity. Most soils fall within the pH range from 3 to 9, but there are exceptions, particularly at the higher end. One pH unit represents a ten-fold change in acidity or alkalinity.

PHA to PHD (dimensionless)
The four x-axis values for the pH relationship.

Photoperiod
Considered equivalent to daylength.

PLANT
The program for making plant files.

Potential rooting depth (PRD, cm)
The maximum depth a plant's root system will reach if all conditions are favourable.

PRD (cm)
See potential rooting depth.

PWATERAVAIL(%)
This indicates the relative water supply to the plant compared with field capacity (100%). Some plants can grow well at values much below 100%. Others cannot.

Quality
Plant files allow for quality to be related to one factor. A relationship which describes the effect of that factor on quality can be entered. Where the effect on quality acts directly through the effect on yield, this provision should not be used.

SALA to SALC (dS/m)
The three x-axis values for the salinity relationship. SALA is pre-set at zero.

Salinity
There are a variety of forms of soil salinity—e.g. that due mostly to sodium ions and that due mostly to chloride ions. Plants can respond differently to these different forms. At present, PlantGro deals with salinity in very general terms, using an estimate based on the electrical conductivity of a saturated soil extract. See also dS/m.

SLA to SLC (deg.)
The three x-axis values for the slope relationship. SLA is pre-set at zero.

SOLAR
Short for solar radiation

Solar radiation

This is the solar energy factor and is different from sunshine hours. PlantGro uses megajoules per square metre per day (MJ/m2/day) as the units of solar radiation. Only about half of this energy is useful for photosynthesis and usually only a small part of that half is trapped by plants. The description and interpretation of solar radiation is a complex matter and many different units have been used in recent years. Appendix 6 gives conversions from the most common units.

SR

See suitability ratings.

SRA to SRE (MJ/m2/day)

The five x-axis values for the solar radiation relationship. SRA is pre-set at zero.

Suitability ratings (SR 0 to 9)

These are used to describe the effects of factors on plant performance. See Figure 1.2.

SUMDU

The total number of development units required to complete a phase of development. SUMDU is stored in the plant file and is used by GRO.BAS to estimate the length of the growing season. See development units.

SURPLUS (mm)

Water received by the soil which exceeds the amount needed to fill the fine pores of the soil. SURPLUS is used with values of DRWC to estimate the drained depth of soil.

TA to TD

These are the 4 x-axis values used in representing the notional relationship for thermal units.

Taxonomic name

This is a name from a recognised scientific naming system, such as plant taxonomy.

t/ha

Tonnes per hectare.

Thermal units (TUs)

These units are calculated from temperature without reference to daylength. They represent parcels of energy which push the plant's development clock along. Their value can be reduced if the plant is sensitive to daylength and the daylength is unfavourable in a time-period. More familiar terms for TUs are heat units, day-degrees, and growing day degrees. Calculation of these units is often done by taking the mean of the maximum and minimum temperature and deducting a base temperature. While convenient, this method can

produce misleading results if daytime temperatures often exceed the optimum for a plant. (See DLFACTOR and development units).

TMAX (deg. C)
The average of the daily maximum temperature for the time-period considered.

TMIN (deg. C)
The average of the daily minimum temperature for the time-period considered.

TLOWEST (deg. C)
The lowest temperature likely for the time-period considered. This is not the lowest minimum temperature ever recorded.

TT (deg. C)
The threshold temperature in the relationships for brief cold, extended cold, and heat damage.

TUs
See thermal units

Water balance
In general terms, this is considered to be the quantity of plant available water (see AWC) which is left in the soil at the end of a unit of time. The state of the balance is the result of additions to the soil, losses due to evaporation from the soil and the plants (see evaporation), and retentive forces in the plant/soil system. This balance crucially affects plant growth. Consideration of rainfall alone can be misleading. See Hackett 1988 for an example of water balance calculations and run PlantGro to obtain output for different soil and climate conditions.

WATER STORAGE
See WST

WL (days)
The x-axis value in the relationship for seasonal waterlogging.

WST (mm)
Stands for soil water store, i.e. the water judged to be held in the fine pores of the soil. This value greatly affects the value of PWATERAVAIL.

111
Filler values in the plant files.

999
Filler values in the plant files.

9999

Indicates in the thermal units portion of a plant file that the plant is being treated as a perennial.