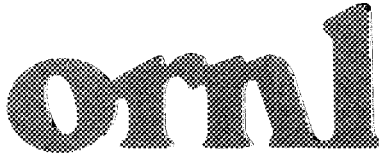




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The SRWCP Database
Management System:
Users Guide, Data Definitions,
and Source Code

A. R. Ehrenshaft
L. L. Wright

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Environmental Sciences Division

**The SRWCP Database Management System:
Users Guide, Data Definitions, and Source Code**

A. R. Ehrenshaft¹
L. L. Wright²

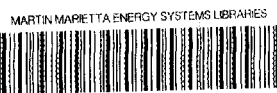
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ABSTRACT

The Users Guide was written to facilitate access to the Short Rotation Woody Crops database which deals with the short rotation intensive culture of woody shrubs and trees. This manual presents some fundamentals about KnowledgeMan,, the computer software that runs the system, provides definitions of the field variables, and contains the source code for the procedures which were developed to adapt the KnowledgeMan software. The manual is organized in six sections. Section 1, Introduction, presents the rationale for the data management efforts. Section 2, Structure of the SRWCP Database Management System, describes the hardware and software requirements, the relational organization of the data, and the procedures developed to customize the KnowledgeMan software. Section 3 explains the use of the database through customized menus. Section 4 briefly illustrates some KnowledgeMan commands. Section 5 presents the source code for the procedures that control the SRWCP database management system and some of the more complex report-generating procedures. Section 6 contains the references used in developing the computer programs for SRWCP database management system. Appendix A lists the files used by the SRWCP database management system, Appendix B contains the data definitions (the Database Key), and Appendix C is a Data Table and Field Name Index.

1. INTRODUCTION

The Short Rotation Woody Crops Program Technical Database users guide was written to facilitate access to information available at Oak Ridge National Laboratory (ORNL) concerning short rotation intensive culture of woody shrubs and trees. ORNL is the technical manager for the Department of Energy's Short Rotation Woody Crops Program (SRWCP). The program began in 1978 with 25 research projects; during the past ten years, 80 projects have been funded. The research has been conducted by universities and private companies as well as by U.S. Forest Service facilities.

The information collected by the SRWCP includes empirical data on species and genotype differences as well as the effect of cultural and climatic variables on growth and productivity. Although some softwoods were established in early species trials, most emphasis has been placed on hardwood species. The goal of the SRWCP is to develop the technology for producing an economically viable source of woody biomass which can be converted to liquid and gaseous fuels. Objectives of the program are to achieve mean biomass production levels of 20 Mg·ha⁻¹·year⁻¹ in 4- to 10-year-old plantations and to develop cost-effective procedures for establishing, maintaining, and harvesting plantations. The development of such technology not only will assure a reliable supply of renewable energy, but also will be a major contribution to the pulp and paper industry.

The SRWCP database management system (DBMS) was developed to manage the vast amounts of data generated by the research efforts. In addition, the system documents the location and type of all field trials established with SRWCP funding or co-funding, transforms the information previously reported in various units and styles into sets of information that can more easily be compared and analyzed, and standardizes data definitions and formats for SRWCP subcontractors to meet the Program's reporting requirements.

The SRWCP database includes data from many different species (>25) along with the associated cultural and climatic conditions of many different sites (>100). Almost 10 years of growth information is now available from several sites. Such a comprehensive data set on the effect of genetic and cultural differences on the growth of hardwoods is not available anywhere else in the United States.

The development of the database occurred in several stages. During the initial phase, a preliminary set of data parameters was identified, a database management system was selected, and a preliminary file structure was organized. In the design and testing stage, menus and forms were developed to facilitate data entry and reporting and data were extracted from subcontractor reports and entered into the database. The ongoing implementation phase consists of (1) verification of the accuracy of the data, (2) reporting of the data in a standardized format by current investigators, (3) continuation of data extraction and input by ORNL staff, and (4) development and modification of the computer software to provide faster data retrieval, error-checking routines and interactive report generation.

This manual was developed to (1) aid in the use of the SRWCP database management system, (2) present some fundamentals about KnowledgeMan[®]¹, the computer software that runs the system, (3) provide definitions of the field variables, and (4) provide a record of the procedures that were developed to adapt the KnowledgeMan software. The manual is organized in six sections. Section 1, Introduction, presents the rationale for the data

¹KnowledgeMan is a registered trademark of Micro Data Base Systems, Inc.

management efforts. Section 2, Structure of the SRWCP Database Management System, describes the hardware and software requirements, the relational organization of the data and the procedures developed to customize the KnowledgeMan software. Section 3 explains the use of the database through customized menus. Section 4 briefly illustrates some KnowledgeMan commands. Section 5 presents the source code for the procedures which control the SRWCP database management system and some of the more complex report-generating procedures. Section 6 contains the references used in developing the computer programs for SRWCP database management system. Appendix A lists the files used by the SRWCP database management system, Appendix B contains the data definitions (the Database Key); and Appendix C is a Data Table and Field Name Index.

2. THE SRWCP DATABASE SYSTEM

2.1 HARDWARE REQUIREMENTS

The SRWCP database currently operates on an IBM PC, upgraded to XT-status. The current version of the SRWCP database management system requires at least 512K RAM and a hard disk.

2.2 SOFTWARE DESCRIPTION

The operating system for the IBM PC is DOS version 3.2. The SRWCP database uses KnowledgeMan/2, created by Micro Data Base Systems, Inc., a software package which has the capacity for relational database management, spreadsheet analysis, statistical analysis, business graphics, text processing, calculations, custom report generation, forms management, and mouse processing. KnowledgeMan is designed to be simple for novice computer users yet powerful enough for applications programmers.

KnowledgeMan was chosen because of (1) its ability to have many data tables in use concurrently, coupled with its ability to link multiple data tables for data retrieval, (2) the power and ease of use of its reporting capabilities, (2) the ease of data file definition and modification, (3) the screen forms management capabilities, and (5) the ease of data modification. In addition, KnowledgeMan can import data directly into spreadsheets for analysis and generate graphics for data presentation.

KnowledgeMan provides many different levels of access to the DBMS and the data. A user can enter the system through (1) KnowledgeMan's menu-guided interface, a series of menus which permits a novice user to immediately use the system, (2) natural language conversation and (3) KnowledgeMan command language. The SRWCP database system was created using KnowledgeMan's command language to design a customized application. Using the SRWCP-menu interface to KnowledgeMan, the user can perform complex tasks easily.

In addition to the database management component, other KnowledgeMan program modules were used for data manipulation, report and procedure generation, and forms development:

1. K-Graph - a multicolor business graphics generator,
2. K-Paint - an interactive screen form generator,
3. K-Report - an interactive report template generator, and
4. K-Text - a text editor.

2.3 SRWCP DATABASE SYSTEM STRUCTURE

The SRWCP database system is designed so that the novice or casual user does not need to know anything about the KnowledgeMan software, database management systems in general, file and data organization, or search and retrieval strategies and commands. A collection of procedures were written to provide a buffer between the user and KnowledgeMan to assist in interacting with a complex database consisting of 32 data files (Table 1). More than 300 parameters have been grouped by subject matter into these files, with the file names reflecting the content of each file. For example, the information concerning the layout for the

Table 1. SRWCP database files

File Name	File Number ^a
Project Identification	1
Principal Investigator	2
Yield Estimates	3
Project Type of Research	4
Site Location	5
Site Average Climate	6
Site Quality	7
Soil Chemistry	8
Soil Physics	9
Site Type	10
Yearly Rain and Temperature/Metric	11
Test Design	12
Test Variables	13
Treatment Size/Spacing	14
Site Preparation	15
Treatment Planting Stock Source	16
Yearly Maintenance by Treatment	18
Yearly Maintenance - Herbicide	19
Yearly Maintenance - Fertilizer	20
Yearly Maintenance - Pest Control	21
Yearly Maintenance - Cultivation	22
Yearly Maintenance - Mowing	23
Yearly Maintenance - Browsing Control	24
Yearly Maintenance - Irrigation	25
Yearly Maintenance - Liming	26
Yearly Wood Quality Characteristics	27
Yearly Harvest Information	28
Yearly Harvest Methods	29
Yearly Biomass Per Test	30
Yearly Biomass Per Treatment	31
Comments	32
Yearly Biomass Equations	33 ^b
Species Names	
Land Resource Regions	
Major Land Resource Areas	
Spacing Codes	

^aThe numbered files are available for browsing and input via the SRWCP Database Management System. The other files are auxiliary ones that do not contain original data and are used to "decode" some of the fields during report generation.

^bThis file is under development at the present time.

experimental test is contained in the test design file and the information containing yearly biomass estimates and measurement information is found in the yearly biomass yield by treatment file. Appendix B, the Database Key, lists the data files and defines the data parameters.

The information generated by each project consists of data on (1) the project level (e.g., cumulative operating costs and principal investigators), (2) the field site level (e.g., rain and temperature information and soil chemistry), (3) experiment or test level (e.g., test design and test variables), and (4) the cultural treatment level (e.g., different planting densities and species under investigation). In addition, data have also been collected on an annual basis for fertilizer and herbicide applications, growth measurements, and, most important, biomass yields.

Figure 1 illustrates the hierarchical relationship of the data files, with the top being the project level, the middle being the site and test level, and the base being the treatment level, with offshoots for monthly and yearly data. Files with data at the project level (files 1-4) usually have one record for each project, while files at the other levels have many records for each project. The files can be related to one another using fields that are repeated (i.e., subnum, keyname, site, testname, treatmnt) in most of the files, allowing information to be merged from different files during the retrieval and reporting processes.

KnowledgeMan creates various files for handling input and output. The following file name extensions designate the different kinds of files:

- ICF Context file, which for SRWCP purposes, contains either a spreadsheet or a screen form (a screen form saved to a context file loads faster than a screen form generated using a "perform" file)
- IND Index file, which enhances the speed of data retrieval
- IPF Perform file, which holds a sequence of one or more KnowledgeMan commands. This file is created with a text editor or word processor (e.g., K-Text or WordPerfect)
- ITB Data table file, which holds a KnowledgeMan table in an encrypted format
- PLT Plot file containing a graphics screen generated by K-Graph
- TPL Template file built with K-Report's *design command for use during report generation
- TXT File holding data or text in some external format (e.g., DIF, ASCII, BASIC)

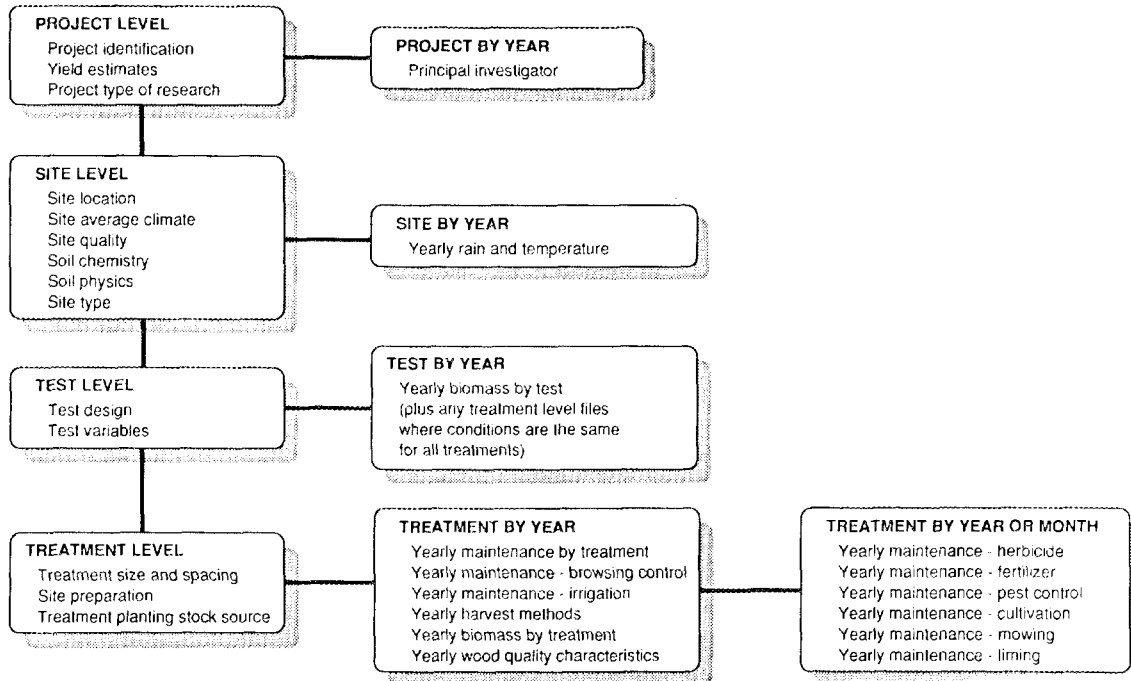


Figure 1. Hierarchical framework of the SRWCP database

Different file types, depending on their purpose, have been stored in four directories on the hard disk: KMAN, SRWCPDAT, SRWCPIPF, and SRWCPRPT. Appendix A lists the files contained in each of these directories. The following list presents an overview of each directory's contents:

KMAN directory	commercially developed KnowledgeMan program files and the SRWCP database startup files
SRWCPDAT directory	data tables (.ITB files), spreadsheets (.ICF files), and graphs (.PLT files)
SRWCPIPF directory	the procedure files (.IPF files) that generate the screen forms for browsing and record creation and context files with tokenized versions of the forms (.ICF files)
SRWCPRPT directory	report-generating programs (.IPF or .TPL files)

2.4 BACKING UP THE DATABASE

The database files are usually backed up weekly. Several different methods are used. The present configuration of the SRWCP PC has two hard disks. The database system resides on drive C and the D drive is used as the backup device. The XCOPY command of DOS 3.2 is used to copy the files from one drive to the other. To back up the entire SRWCP Database Management System, type:

<code>XCOPY \SRWCPDAT*. * D:\SRWCPDAT</code>	copy the data tables from C:\srwcpdat to D:\srwcpdat
<code>XCOPY \SRWCPIPF*. * D:\SRWCPIPF</code>	copy the form program files from C:\srwcpipf to D:\srwcpipf
<code>XCOPY \SRWCPRPT*. * D:\SRWCPRPT</code>	copy the report program files from C:\srwcpcpt to D:\srwcpcpt

Another method is to back up the data to floppy disks. The "Backup" option from the application menu (Fig. 2) displayed when the computer is turned on prompts the user to select the type of files to be backed up.

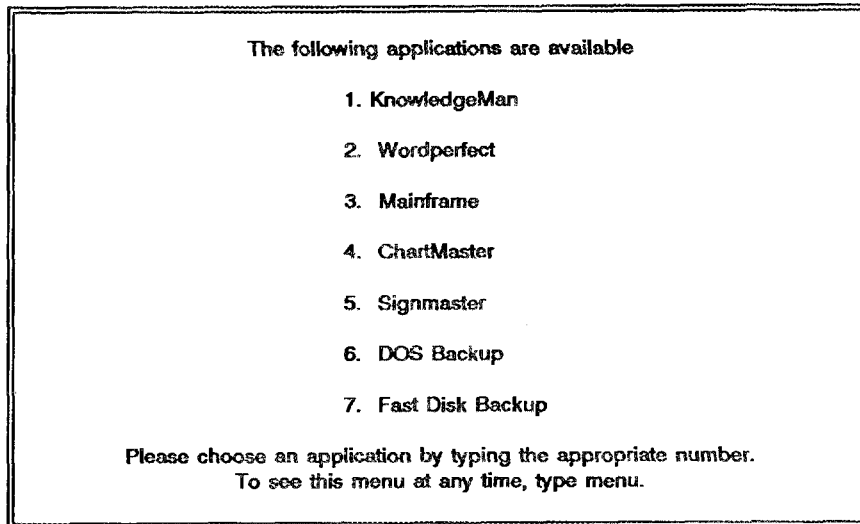


Fig. 2. Applications menu

Figure 3 displays the selections that are available if DOS Backup is chosen. The user then selects one of the options and is then prompted to insert the floppy disks in drive A.

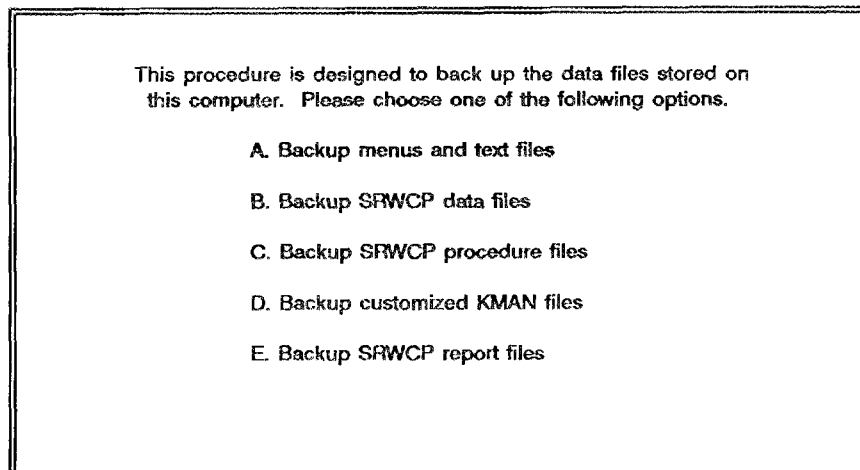


Fig. 3. Back up options menu

3. USE OF SRWCP DATABASE THROUGH CUSTOMIZED MENUS

This section steps through each of the options available from the SRWCP database management system. User input is highlighted in bold type.

3.1 STARTUP

When the computer is turned on, a list of the available programs is drawn on the screen (Fig. 2). Select **KnowledgeMan** to gain access to the SRWCP Database Management System. The user is immediately prompted for a user name and password. Typing **SRWCP** at the user name prompt and **ROA** at the password prompt allows read only access to the data tables. The user will not be able to input or modify the data. Other passwords are available for users trained to modify the data tables or the structure of the database system. The next screen prompts the user to decide whether to proceed to the SRWCP database menu system (Fig. 4).

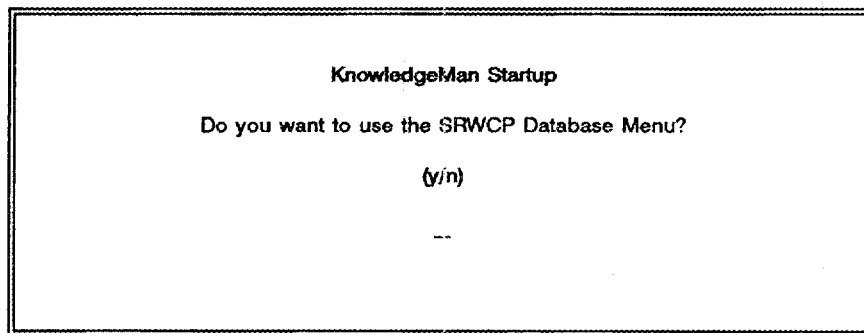


Fig. 4. SRWCP initial screen

Typing **"Y"** and a carriage return will initialize the SRWCP database system. Typing anything other than **"Y"** will pass control to the KnowledgeMan operating environment where the SRWCP database can be accessed using KnowledgeMan command language (see Section 4). In the KnowledgeMan operating environment, the user is presented with a blank screen except for the KnowledgeMan prompt **"_"**. To reenter the SRWCP database management system at any time from the KnowledgeMan operating environment, type **PERFORM STARTUP**. Again, type **Y** at the prompt.

Once the SRWCP database system is chosen, a message flashes on the screen indicating that system initialization is in progress. When this process is completed, the Main Menu is displayed as shown in Figure 5. The effect of selecting each option is explained in the following sections.

SRWCP DATABASE	
MAIN MENU	
BROWSE THROUGH THE SRWCP DATABASE	1
INPUT DATA INTO THE SRWCP DATABASE	2
EXTRACT DATA OR REPORT FROM SRWCP DATABASE	3
MISCELLANEOUS PROGRAMS AND REPORTS	4
ENTER KNOWLEDGEMAN COMMAND LANGUAGE MODE	5
ENTER KNOWLEDGEMAN MENU-GUIDED INTERFACE	6
EXIT SYSTEM AND RETURN TO DOS	7
Please Select Function _	

Fig. 5. SRWCP main menu

3.2 MAIN MENU OPTIONS

3.2.1 Browse Through the SRWCP Database

Choose Main Menu Option "1" to scan or browse the database files record by record. Selection of Main Menu Option "1" brings up the Database Files Menu (Fig. 6).

Entering a number will open one of the files, and the data values of the first record are displayed using one of the SRWCP customized forms. In this mode, all records can be viewed sequentially in either ascending (using the left arrow on the keypad or "ctrl f") or descending (using the right arrow on the keypad or "ctrl a") order by their accession numbers. This is a good method for viewing files with a small number of records such as project- and site-level files, but it is not very useful for viewing data on the test or treatment level in files with a lot of records. To view a specific set of records from one of these files, the SRWCP Main Menu must be exited and the KnowledgeMan operating environment entered. The process of using KnowledgeMan command language to limit searching and retrieval is explained in Section 4.

SRWCP DATABASE DATA FILES			
Project Identification	1	Yearly Maintenance/Trtmt	18
Primary Investigator	2	Yearly Maintenance (Herb)	19
Yield Estimates	3	Yearly Maintenance (Fert.)	20
Project Type of Res.	4	Yearly Maintenance (Pst Ctl)	21
Site Location	5	Yearly Maintenance (Cult.)	22
Site Average Climate	6	Yearly Maintenance (Mowing)	23
Site Quality	7	Yearly Maintenance (Brs Ctl)	24
Soil Chemistry	8	Yearly Maintenance (Irgtn)	25
Soil Physics	9	Yearly Maintenance (Liming)	26
Site Type	10	Wood Quality Characteristics	27
Year. Rain/Temp Data	11	Yearly Harvest Information	28
Test Design	12	Yearly Harvest Methods	29
Test Variables	13	Yearly Biomass Yields/Test	30
Treatment Size/Spacing	14	Yearly Biomass Yields/Trtmt	31
Site Preparation	15	Yearly Biomass Equations	32
Planting Stock Source	16	Comments	33

Please Select Data File to Browse/Update/Report or 0 to Stop: _

Fig. 6. Database file menu

Modification of records can be performed while in browse mode if the user has read and write access. In addition to the "ROA" password, other passwords are available for users needing to have write access to the data tables. The database manager determines the level of access for each user.

Pressing the "enter" key will move the cursor to each field in the record. Data values can be changed by moving to the desired field and typing in the change. In addition to using the "enter" key to move to the next field, the down arrow also moves the cursor to the next field and the up arrow moves the cursor to the previous field. The following keys facilitate cursor movement and editing:

- Control S move the cursor one position to the left
- Control D move the cursor one position to the right
- Control W toggle between insertion and type-over editing

KnowledgeMan recognizes the arrow keys, the backspace and the delete key on an IBM keypad and most IBM clones.

Changes do not become effective until the "enter" key has been pressed and the cursor has moved to the next field. If a user without write access to a table attempts to modify a field value, the computer beeps and an "ACCESS DENIED" message appears on the screen.

To exit from the "browse" mode after all the applicable records have been examined, pressing the "escape" key will display the following prompt in the lower right hand corner of the screen: "Continue browsing/updating (Y/N)?" If the "Y" option is chosen, the next sequentially numbered file from the Database Data Files Menu is opened and presented for browsing. If the "N" option is chosen, the user is returned to the SRWCP DataBase Data Files menu. At this time, the user can select another file by choosing the appropriate number or can return to the Main Menu by typing 0 (Fig. 5).

3.2.2 Enter Data into the SRWCP Database

New records can be added to the SRWCP data base by choosing option "2" from the Main Menu (Fig. 5). Users with read only access (password=roa) will receive the following message: "Write Access to file denied; press any key to continue." Users with read and write access may use the SRWCP Database Data Files menu to choose the files for adding new records. Once a file number has been chosen, a completed form appears on the screen. The record appears to contain data because a KnowledgeMan variable (e.lmod) has been set to use the last record created as the basis for the new records. Only the fields with different data must be changed. Once the data values for a new record have been entered and the "enter" key pressed, the form is redrawn showing the new data values. This form is then the basis for creating another record. If data are partially entered and the user wishes to quit without saving that particular record, pressing "escape" exits the input session without saving that record. All the other records created during that session will be saved. After all new records have been entered in a given file, the "escape" key should be struck. Because it is very easy to enter incomplete or duplicate records during the input process, it is recommended that the newly created records be checked by entering the browse mode as previously explained to view these records.

The following prompt appears in the lower righthand corner of the screen: "Continue Creating/Updating? Y/N" after the "escape" key is pressed. Type Y to begin input in the next sequentially numbered file from the Database Data Files Menu. Type N to return to the SRWCP Database Data Files menu. At this time, the user can select another file by entering the appropriate number or may return to the main menu by typing 0.

3.2.3 Extract Data or Report from SRWCP Database

Choose option 3 of the SRWCP Main Menu (Fig. 5) to gain access to information residing in specific data files. Selection of this option passes control to the reporting procedure, and the SRWCP Database Files Menu (Fig. 6) is again displayed. From this menu, the user selects the data file and enters the number from the menu associated with the report desired.

A report may be generated with information for either a single project (the search will be limited by the keyname for a particular project) or all projects in that file. A list of valid keynames from the PROJID file appears on the screen. (A keyname is derived from the first 8 letters of a project's primary investigator's last name. For example, the primary investigator for North Carolina State University is Doug Frederick; taking the first 8 characters from Frederick yields a keyname of "Frederic".) The user is then prompted with "Input Keyname or hit ENTER

for all". The "Do you want this sent to the printer? (y/n)" prompt allows the user to choose between viewing the data on the screen or generating a printout.

Commonly made errors may lead to undesirable results but recovery is easy. If the user presses the enter key in response to both questions or presses the "escape" key, all the data from that file will be displayed either on the screen or a printout. To stop the display or printing of a report that is in progress, press the "escape" key. This not only stops the reporting process, but also exits the user to the KnowledgeMan command mode (identified by a blank screen and the "_" prompt). To reenter the SRWCP database management system, the user should first close any open tables and free the computer's memory. To do this, type **FINISH ALL; RELEASE ALL;** press the "enter" key and type **PERFORM STARTUP.** If this doesn't work, type **BYE** to exit the SRWCP database management system and return control to the disk operating system (DOS). Select KnowledgeMan from the application menu (Fig. 2) and start over.

3.2.4 Miscellaneous Programs and Reports

Select option 4 from the Main Menu (Fig. 5) to gain access to more complex reports and the data conversion program. This results in the display of a menu entitled "Miscellaneous Reports and Programs" (Fig. 7).

MISCELLANEOUS REPORTS AND PROGRAMS	
Number of Projects and Sites per Species	1
Number of Species and Sites per Project	2
Yields by Project, Species and Year	3
Complete Listing for a Particular Project	4
Treatment Yields of Species by Region (Statistics Only)	5
English to Metric Data Conversion Program	6
Yearly Rain/Temperature (Fahrenheit/Inches) Program	7
Please Select Report/Program to be Printed or 0 to Stop: _	

Fig. 7. Miscellaneous programs and report menu

These reports were developed by SRWCP staff based on previous data requests and perceived needs. They link data from many different files in order to generate relevant sets of information. Sample pages from the reporting options are given in Tables 2 through 5.

After selecting one of the reports, the user is asked if the report should be sent to the printer. If the printer option is selected, the printer should be turned on. If the message "Writing fault error. Writing device PRN" appears, check to see that the printer is turned on.

During the search and retrieval operation, messages appear on the screen indicating the status of the operation. The time necessary to produce any of these reports is dependent on its complexity (the number of files opened, sorting and control break commands, etc.); the time between the appearance of the message "Search and Retrieval Underway" to initiation of output usually ranges between 10 and 20 minutes. For the larger, more complex reports, printing time may take as long as an hour. When the report has finished printing, the report menu is again presented on the screen and the user has the opportunity to select another report or return to the Main Menu.

If for some reason, the report generating process must be stopped, press the "escape" key. The user is put into the KnowledgeMan command mode. To return to the SRWCP database management system, type **FINISH ALL; RELEASE ALL;** press the "enter" key and type **PERFORM STARTUP.** The source code for these reports are in Section 4 and may be used as templates for developing other reporting procedures.

Some of the report-generating programs provide some flexibility in limiting the scope of the reports. An explanation of the alternatives associated with each report is provided below.

Projects and Sites by Species (option 1) - no alternatives; report contains data for all projects sorted by species.

Species and Sites by Project (option 2) - no alternatives; report contains data for all species sorted by projects.

Yields by Project, Species, and Year (option 3) - data can be selected for a specific year, for a specific project, for all years for a specific project, or for all years for all projects based on user response to screen prompts for input of a year and/or a keyname.

Complete Listing for a Particular Project (option 4) - information is retrieved from each of the 32 data tables for a specific project based on user response to a screen prompt for input of a keyname.

Regional Biomass Yields by Species (option 5) - no alternatives; report contains statistical data for all tests.

English/Metric Data Conversion Program (option 6) - user is presented with a menu (Fig. 8). Each of these choices causes the computer to act as a calculator to perform the necessary conversions. The user inputs the English unit and the computer responds with the metric one.

```

                                Conversion Programs

1.          Convert Celsius to Fahrenheit
2.          Convert Fahrenheit to Celsius
3.          Convert Feet to Meters
4.          Convert Meters to Feet
5.          Convert Acres to Hectares
6.          Convert Tons/Acres to Mg/ha
7.          Terminate program

Enter your choice:  ____

```

Fig. 8. English to metric data conversion menu

Yearly Rain/Temperature (Fahrenheit/Inches) Program (option 7) - user is presented with a menu (Fig. 9) from which he/she can browse or create records for a file consisting of the same fields as the Yearly Rain/Temperature file (file 11 on the Database File Menu), except that the data can be entered in English units, with the computer converting the data to metric units. The third choice, transfer data, takes the records from this file and attaches them to the Yearly Rain/Temperature file.

```

                                Yearly Rain/Temperature File - English Units
                                Browse/Create/Transfer Program

Browse the file          1
Create records          2
Transfer data           3

Enter your choice or 0 to stop  ____

```

Fig. 9. Yearly rain/temperature (fahrenheit/inches) program menu

Table 2. Sample page from projects and sites by species report

Species	Institution	Sites Planted
Acacia abyssinica	Energy Development Inc.	Glendale Las Cruc Premont
Acacia karoo		Las Cruc
Acacia melanoxylon	Energy Development Inc.	AkaF54C KamF26B
	Bioenergy Development Corp.	KamF27B KamF27C OnoV05A
Acacia victoria		Las Cruc
Alnus glutinosa	Energy Development Inc.	AmanalA FicklA HarshawW
	Iowa State University	HindsIA HummeWye RhodesIA Bertie Granville DP1
	North Carolina State U.	Ornl17 Ornl31
	University of Florida	Putnam Tatnall
	University of Georgia	DSBottom DSUpland
	University of Illinois	Phillips Puyallup
	University of Washington	

Table 3. Sample page from species and sites by project report

Institution	Species	Sites Planted
Kansas State University	Acer saccharinum	Clinton
		Sunflowr
		TeePee
	Casuarina	Tuttle
		Cheney
		Milford1
		SterIng2
		Colby
	Gleditsia triacanthos	Garden
		Logan
		Riley
		Tribune
	Populus deltoides	Cheney
		Clinton
		Milford1
		Milford2
		SterIng2
		Sunflowr
		TeePee
Tuttle		
Cheney		
Clinton		
Robinia pseudoacacia	Colby	
	Garden	
	Logan	
	Milford1	
	Milford2	
	Riley	
	SterIng2	
	Sunflowr	
	TeePee	
	Tribune	
Ulmus pumila	Tuttle	
	Clinton	
	Colby	
	Garden	
	Logan	
	Milford2	
	Riley	
	Sunflowr	
Teepee		
Tribune		

Table 4. Sample page for yields by project, species, and year report

Site	Test	Treatment	Species	Rotation	Growth year	Root	Trees/ha	Area/trt	# Reps	Trees/rep	Total yield	Avg. yield	DBH	DSH	Height	
Norwalk	RotLen2	A1G1S20	Alnus glutinosa	2	2.00	4.00	4444	0.01	5	56	0.50	0.25	1.50	0.00	2.70	
Norwalk	RotLen2	A1G1S24	Alnus glutinosa	2	2.00	4.00	2667	0.02	5	56	1.10	0.55	2.00	0.00	3.60	
Norwalk	RotLen2	FrPeS11	Fraxinus pennsylvanica	2	2.00	4.00	8889	0.01	5	56	0.80	0.40	0.00	0.00	1.00	
Norwalk	RotLen2	FrPeS20	Fraxinus pennsylvanica	2	2.00	4.00	4444	0.02	5	56	0.70	0.35	0.20	0.00	1.20	
Norwalk	RotLen2	FrPeS24	Fraxinus pennsylvanica	2	2.00	4.00	2667	0.01	5	56	0.60	0.30	0.50	0.00	1.60	
Norwalk	RotLen2	LiStS11	Liquidambar styraciflua	2	2.00	4.00	8889	0.01	5	56	1.50	0.75	0.50	0.00	1.80	
Norwalk	RotLen2	LiStS20	Liquidambar styraciflua	2	2.00	4.00	4444	0.01	5	56	1.60	0.80	2.00	0.00	2.70	
Norwalk	RotLen2	LiStS24	Liquidambar styraciflua	2	2.00	4.00	2667	0.02	5	56	2.10	1.05	0.00	0.00	3.00	
Norwalk	RotLen2	P1DcS11	Platanus occidentalis	2	2.00	4.00	8889	0.01	5	56	0.90	0.45	0.80	0.00	2.10	
Norwalk	RotLen2	P1DcS20	Platanus occidentalis	2	2.00	4.00	4444	0.02	5	56	1.20	0.60	1.30	0.00	2.70	
Norwalk	RotLen2	P1DcS24	Platanus occidentalis	2	2.00	4.00	2667	0.02	5	56	3.50	1.75	1.50	0.00	4.00	
Norwalk	RotLen2	QuNiS11	Quercus nigra	2	2.00	4.00	8889	0.01	5	56	0.60	0.30	0.00	0.00	1.30	
Norwalk	RotLen2	QuNiS20	Quercus nigra	2	2.00	4.00	4444	0.01	5	56	1.20	0.60	0.50	0.00	1.80	
Norwalk	RotLen2	QuNiS24	Quercus nigra	2	2.00	4.00	2667	0.02	5	56	0.30	0.15	0.00	0.00	1.10	
				28	28.00	56.00	71111	0.19	5	784	16.60	8.30	10.80	0.00	30.60	Sum
				2	2.00	4.00	5079	0.01	5	56	1.19	0.59	0.77	0.00	2.19	Ave
				2	2.00	4.00	2667	0.01	5	56	0.30	0.15	0.00	0.00	1.00	Min
				2	2.00	4.00	8889	0.02	5	56	3.50	1.75	2.00	0.00	4.00	Max
Number of Observations: 14																
Norwalk	SpecSpac	A1G1S11	Alnus glutinosa	1	8.00	8.00	8889	0.02	5	56	41.50	5.19	5.80	9.10	10.10	
Norwalk	SpecSpac	A1G1S20	Alnus glutinosa	1	8.00	8.00	4444	0.05	5	225	38.80	4.85	7.90	11.40	11.20	
Norwalk	SpecSpac	A1G1S24	Alnus glutinosa	1	8.00	8.00	2667	0.08	5	225	26.10	3.26	7.60	12.70	9.70	
Norwalk	SpecSpac	FrPeS11	Fraxinus pennsylvanica	1	8.00	8.00	8889	0.02	5	225	33.80	4.22	4.10	7.40	6.80	
Norwalk	SpecSpac	FrPeS20	Fraxinus pennsylvanica	1	8.00	8.00	4444	0.05	5	225	29.30	3.66	4.80	7.60	7.90	
Norwalk	SpecSpac	FrPeS24	Fraxinus pennsylvanica	1	8.00	8.00	2667	0.08	5	225	19.20	2.40	5.30	9.60	6.40	
Norwalk	SpecSpac	LiStS11	Liquidambar styraciflua	1	8.00	8.00	8889	0.02	5	225	39.30	4.91	6.10	8.40	7.50	
Norwalk	SpecSpac	LiStS20	Liquidambar styraciflua	1	8.00	8.00	4444	0.05	5	225	32.50	4.06	6.80	10.20	8.00	
Norwalk	SpecSpac	LiStS24	Liquidambar styraciflua	1	8.00	8.00	2667	0.08	5	225	28.10	3.51	8.40	13.00	8.40	

Table 5. Sample page from regional biomass yields by species report

Region	State	Species	Site	Test name	Treatment	Rotation	Age	Tot. yield	Avg. yield	
						6.00	24.00	362.80	90.70	Sum
						1.00	4.00	60.47	15.12	Ave
						0.00	0.00	21.15	1.32	Var
						0.00	0.00	4.60	1.15	Sdv
PNW	WA	Alnus glutinosa	Puyallup	n2fxspmx	Arli/Ald	1.00	4.00	52.00	13.00	Min
PNW	WA	Alnus glutinosa	Puyallup	n2fxspmx	Sant/Ald	1.00	4.00	64.40	16.10	Max
Number of Observations: 6 (Species Level Statistics)										
						6.00	30.00	28.70	5.74	Sum
						1.00	5.00	4.78	0.96	Ave
						0.00	0.00	11.09	0.44	Var
						0.00	0.00	3.33	0.67	Sdv
PNW	WA	Alnus rubra	Centrali	ThinSpac	AlRuS14	1.00	5.00	1.40	0.28	Min
PNW	WA	Alnus rubra	Centrali	ThinSpac	AlRuS42	1.00	5.00	9.60	1.92	Max
Number of Observations: 6 (Species Level Statistics)										
						15.00	60.00	902.40	225.60	Sum
						1.00	4.00	60.16	15.04	Ave
						0.00	0.00	86.62	5.41	Var
						0.00	0.00	9.31	2.33	Sdv
PNW	WA	Populus trichocarpa	Puyallup	n2fxspmx	Arlingto	1.00	4.00	39.60	9.90	Min
PNW	WA	Populus trichocarpa	Puyallup	prov1a	Snoqualm	1.00	4.00	75.20	18.80	Max
Number of Observations: 15 (Species Level Statistics)										
						27.00	** **	1293.90	322.04	Sum
						1.00	4.22	47.92	11.93	Ave
						0.00	0.18	605.01	38.97	Var
						0.00	0.42	24.60	6.24	Sdv
PNW	WA	Alnus glutinosa	Centrali	ThinSpac	AlRuS14	1.00	4.00	1.40	0.28	Min
PNW	WA	Populus trichocarpa	Puyallup	prov1a	Snoqualm	1.00	5.00	75.20	18.80	Max
Number of Observations: 27 (State Level Statistics)										
						88.00	** **	4134.06	585.66	Sum
						1.00	8.36	46.98	6.66	Ave
						0.00	14.53	741.41	26.91	Var
						0.00	3.81	27.23	5.19	Sdv
PNW	OR	Alnus glutinosa	Cascade	AlProven	AlRuS13	1.00	4.00	1.40	0.28	Min
PNW	WA	Populus trichocarpa	StHelens	prov1a	Snoqualm	1.00	15.00	117.53	18.80	Max
Number of Observations: 88 (Region Level Statistics)										

3.2.5 Enter KnowledgeMan Command Language Mode

Choose Main Menu Option 5 (Enter KnowledgeMan Command Language Mode, Fig. 5) to perform queries and operations outside the scope of the customized options provided by the SRWCP Database Menu System. This choice allows the user to enter the KnowledgeMan operating environment. At this point the screen goes blank and the KnowledgeMan prompt, a "_", appears. A more complete discussion concerning the use of KnowledgeMan's command language is found in Section 4. To regain access to the SRWCP Database Main Menu, type **PERFORM STARTUP**.

3.2.6 Enter KnowledgeMan Menu-Guided Interface

Choose Main Menu option 6 to gain access to the menu-guided interface to KnowledgeMan. The menu-guided interface is a good tool for inexperienced users of the SRWCP Database Management System. KnowledgeMan presents available processing options (data viewing, data reporting, data input, etc.) with a series of menus. Selecting an option immediately causes the next level of options to be displayed. Different menus are presented until a complete command has been built. KnowledgeMan then executes the desired action. Going through the tutorial found in the KnowledgeMan User's Guide is a good way to become familiar with basic KnowledgeMan operational procedures.

The major drawback with using the menu-guided interface is the inefficiency of user-built commands, particularly for data retrieval from more than one table at a time. Although the user-built command will be syntactically correct, it will take much longer to retrieve the desired information than a procedure developed using KnowledgeMan command language. In addition, KnowledgeMan assumes that the data tables and spreadsheets are contained in the same directory as the KnowledgeMan program files. Choice of the SRWCP Main Menu option 6 places the user in the KMAN directory. The user must then go through several menus within the menu-guided interface to change directories.

To access SRWCP database information through the KnowledgeMan menu-guided interface, the user must understand the organization of the SRWCP data management system (i.e., the directory location of the data tables, "perform" files, and table location of all fields). Appendix A shows all directories used by the SRWCP database and the files that are associated with each directory. The location of data fields within the data tables can be determined by examining the Database Key in Appendix B. (As previously mentioned, data tables are in the \SRWCPDAT directory and "perform" files for report generation are in the \SRWCPRPT directory.)

3.2.7 Exit System and Return to DOS

Choose option 7 to exit from the SRWCP database management menu system (Fig. 5). All files are closed; KnowledgeMan memory resources are released; and DOS takes control.

4. USING KNOWLEDGEMAN COMMAND LANGUAGE

This user's manual is not intended to be an in-depth explanation of the KnowledgeMan DBMS. However, this section discusses some commands and develops a typical procedure to help a user retrieve information when the menu-driven SRWCP database system cannot meet his/her needs such as locating data for one site, rather than all sites, for a particular project, or identifying the biomass yields from only spacing/density tests. Because this manual is designed to be a "quick look-up" for command syntax, the same material appears in several sections. The KnowledgeMan/2 Reference Manual contains comprehensive information about the commands and procedures discussed in this section. Throughout this section, data files (files with .ITB extensions containing tables) will be referred to simply as "tables".

4.1 THE "USE" COMMAND TO OPEN A TABLE

Before any operations can be done, a table must first be opened. Consult the Database Key (Appendix B) to find the table that contains the desired data fields and to identify the table's database code name. In order for KnowledgeMan to find that table, a fully qualified path name must be included in the command. This means specifying the directory and the table in the USE command. To open an SRWCP data table, precede the table name with SRWCPDAT, the directory containing the tables. For example, to open the yearly yield by treatment table (YRYLDTRT), type

```
USE "\\SRWCPDAT\\YRYLDTRT".
```

Note the use of two backslashes (\\). KnowledgeMan uses a single backslash (\) for many purposes. In order for KnowledgeMan to recognize this symbol literally for processing by DOS to indicate the directory path name, the two backslashes must be used. If the table is already in use, a message ("table xxx in use"), which can be ignored, appears on the screen. Once a table has been opened, it can be referred to by simply its table name and does not need to have the directory name preceding it.

4.2 VIEWING THE CONTENTS OF A TABLE

4.2.1 Browse Command

After a table has been opened for use, the BROWSE command can be used to view the records in the table. To issue the command, type

```
BROWSE .
```

If more than one table has been opened during a session, specify the table to be browsed by typing

```
BROWSE TABLENAME (e.g. BROWSE YRYLDTRT) .
```

The contents of the first record in the table are presented in the default KnowledgeMan form, displaying the 8-character field code names in the order of field creation in a single column, which may extend over more than one screen. If the user has write access to the data

table, data values can be modified by moving the cursor to the appropriate field. The edited version of a field's data as it appears on the screen replaces the old value of the field in the table when the "enter" key is pressed. If the "escape" key is pressed in the middle of changing a displayed value, then the process halts and the value that was being changed is unaltered.

4.2.2 Using Forms for Browsing

The same forms that are used by the SRWCP Database Management System can be accessed through the KnowledgeMan command language as an alternative to the default KnowledgeMan browsing format which shows the 8-letter field name codes. Using forms for browsing is preferable because the field names are written out rather than just the field code names, the order of the field display is more coherent in terms of data grouping, and the forms have built-in error checking for input values.

Using a form is a two-step process. The first step consists of loading the file with the form into memory. The command can take one of two formats. To load a form which has been saved in an executable (.ipf) file, type

```
PERFORM *\\SRWCPIPF\\FILENAME* (e.g., PERFORM *\\SRWCPIPF\\YRYLDTRT*).
```

To load a tokenized form (an .icf file which doesn't have to be interpreted by the computer), type

```
LOAD FROM *\\SRWCPIPF\\FILENAME* WITH "F" (e.g., LOAD FROM
*\\SRWCPIPF\\YRYLDTRT* WITH "F").
```

The "f" option indicates that only variables associated with form definition are loaded into memory.

The second step is to issue the BROWSE command and name the form to be used:

```
BROWSE TABLENAME WITH FORMNAME (e.g., BROWSE YRYLDTRT WITH YRYLDTRT).
```

4.2.3 Limiting the Scope of Records Retrieved (Conditional and Wildcard Searching)

Sometimes it is desirable to limit the scope of the records retrieved based on certain conditions. For example, if only the records for Penn State are wanted, a FOR clause with the field and the condition with which to limit the search is added to the BROWSE command:

```
BROWSE FOR KEYNAME="BLANKENH".
```

If an invalid value is entered, the search will be made, but the message "No records satisfy this request" will result.

If a field is composed of character data, the value for that field must be enclosed in double quotes. The above example uses the KEYNAME field and the code name of the primary investigator for Penn State ("blankenh") as the limiting criteria. If a user does not know the keyname for a particular institution, the project identification file (code name, projid, option 1 from the Database File Menu) can be scanned to locate the keyname associated with a research institution. The KEYNAME field appears in all tables. It was designed to be used as

the limiting criteria for project level searches because a research institution may have more than one SRWCP project, each directed by a different investigator.

When the exact form of a field value is not known, wildcard searching techniques can be used. A wildcard can match any value. KnowledgeMan uses the "*" symbol as the wildcard matching character. For example, suppose the user only wants to examine the records for spacing tests and knows that "SPA" is part of the test name but is not sure of the exact format, then the BROWSE command would take the form of

BROWSE FOR TESTNAME IN [*SPA*],

meaning "look for any occurrence of SPA within the test name field." Records for TESTNAME = "SPACING" or TESTNAME = "SPECSPAC" or TESTNAME = "CLONSPA" would be retrieved.

If only the records containing information for calendar year 1985 (note: calenyr is stored as an alphanumeric string and not as a number) and the Cheney site (in computer language an "AND" search) are desired, the command is

BROWSE YRYLDTRT FOR SITE="CHENEY" AND CALENYR="1985".

If the user wants to examine records from more than one site during the retrieval process (in computer language an "OR" search), the command takes the following form:

BROWSE YRYLDTRT FOR SITE IN ['CHENEY' 'TEEPEE'].

An "AND" search can be combined with an "OR" search to retrieve, for example, the records containing data for 1985 and the Cheney and Teepee sites by entering

BROWSE YRYLDTRT FOR SITE IN ['CHENEY' 'TEEPEE'] AND CALENYR="1985".

4.3 GENERATING A REPORT

4.3.1 "Select" Command

The SELECT command is a simple but powerful command used to generate a report send it to either the screen, the printer, or a disk file. Data values are displayed for only those fields specifically listed within the command. The data are presented in tabular form with one row for each record; the columns are arranged in the same order as the fields specified in the command. The report presentation can be enhanced using several KnowledgeMan environment variables (see Section 6 in the KnowledgeMan Reference Manual).

Assuming that the yearly yield by treatment (YRYLDTRT) table has been opened for use, to generate a report with information on projects, sites, tests, treatments, calendar years, rotations, growth years, and biomass yields, the command would be

**SELECT KEYNAME, SITE, TESTNAME, TREATMNT, CALENYR, ROTATION,
 GROWTHYR, BIOYIELD.**

4.3.2 Limiting the Scope of Data Retrieved (Conditional and Wildcard Searching)

If the user wants to generate a report with information from only one project, a "FOR" clause can be added to the SELECT command to narrow the scope of the records retrieved to only those concerning the project in demand. Any fields can be used to limit search, even if they are not part of the output list. To limit a search to records containing information about Kansas State University, the following command would be used:

```
SELECT      KEYNAME, SITE, TESTNAME, TREATMNT, CALENYR, ROTATION,
           GROWTHYR, BIOYIELD FOR KEYNAME="GEYER"
```

where "Geyer" is the keyname code for the Kansas State primary investigator. If a user does not know the keyname for a particular institution, the project identification file (code name, projid, option 1 from the Database File Menu) can be scanned to locate the keyname associated with a research institution. The KEYNAME field appears in all tables. It was designed to be used as the limiting criteria for project level searches because a research institution may have more than one SRWCP project, each directed by a different investigator.

If the user wants to generate a report with information from more than one site during the retrieval process (in computer language an "OR" search), the command takes the following form:

```
SELECT      KEYNAME, SITE, TESTNAME, TREATMNT, CALENYR, ROTATION,
           GROWTHYR, BIOYIELD FOR SITE IN ['CHENEY', 'TEEPEE'].
```

An "AND" search can be combined with an "OR" search to generate a report with, for example, the records containing data for 1985 and the Cheney and Teepee sites by entering

```
SELECT      KEYNAME, SITE, TESTNAME, TREATMNT, CALENYR, ROTATION,
           GROWTHYR, BIOYIELD FOR SITE IN ['CHENEY' 'TEEPEE'] AND
           CALENYR="1985".
```

If we wanted a listing of projects, sites, tests, treatments, calendar years, growth years, rotations and biomass yields for only those records that contain data for biomass yields in 1985, the command would be

```
SELECT      KEYNAME, SITE, TESTNAME, TREATMNT, CALENYR, ROTATION,
           GROWTHYR, BIOYIELD FOR CALENYR="1985" AND BIOYIELD NE 0.
```

The "BIOYIELD NE 0" clause eliminates records which do not have yield data for 1985 (calenyr = "1985").

When the exact form of a field value is not known, wildcard searching techniques can be used. A wildcard can match any value. KnowledgeMan uses the "*" symbol as the wildcard matching character. For example, suppose the user wants to generate a biomass yield report for spacing tests and knows that "SPA" is part of the test name, then the SELECT command would take the form of

```
SELECT      KEYNAME, SITE, TESTNAME, TREATMNT, CALENYR, ROTATION,
           GROWTHYR, BIOYIELD FOR TESTNAME IN ['**SPA*'] AND BIOYIELD NE
           0.
```

meaning "look for any occurrence of SPA within the test name field." Records for TESTNAME = "SPACING" or TESTNAME = "SPECSPAC" or TESTNAME = "CLONSPA" would be retrieved.

4.3.3 Specifying Output Order

To make a report more understandable, the output of the data can be arranged using an "ORDER BY" clause. The ORDER BY clause causes the output to be sorted by the values found in the fields following it. Any data fields can be used as sorting criteria, even if they are not part of the SELECT list. The command to produce a report in which the data will be organized by keyname, site, test, treatment, rotation and growth year is

```
SELECT      KEYNAME, SITE, TESTNAME, TREATMNT, CALENYR, GROWTHYR,
            ROTATION, BIOYIELD, FOR CALENYR='1985' AND BIOYIELD NE 0,
            ORDER BY KEYNAME, SITE, TESTNAME, TREATMNT, ROTATION,
            GROWTHYR.
```

4.4 GENERATING A REPORT FROM MORE THAN ONE TABLE

This section illustrates a step-by-step method to develop a report-generating procedure that is more complex than those described in the preceding section. For the purposes of illustration, the following question has been posed: "Where are the tests located and what factors are being analyzed at each institution?"

STEP 1: Separate the question into its component parts (e.g., institution, site location, test design). Use the Database Key (see Appendix B) to identify the appropriate tables and field code names. The tables and field codes for the desired variables, as well as some other variables needed to make the report more comprehensive, are listed below.

Table	Field(s)
PROJID	institut
SITELOC	state, county, site, areapltd
TESTVARS	testname, species, provnc, clones, estbmthd, fertility, irrigatn, cultivatn, wstwater, herbicid, spacing, rotlngth, harvmthd, harvdate, n2fxspec

Fig. 10. Identifying tables and fields for multiple table reports

STEP 2: Once the appropriate tables have been identified, examine the fields contained in each table to determine which fields are duplicated in the other tables. These fields will be used to link the tables.

Fields	Table
subnum, keyname	PROJID, SITELOC, TESTVARS
subnum, keyname, site	SITELOC, TESTVARS

Fig. 11. Identifying fields for linking purposes

STEP 3: Starting with the file containing the most records (in this case, TESTVARS), determine which fields can be matched to fields in other tables to represent a unique pointer for each record in the largest table. In this case, site in TESTVARS can be matched to site in SITELOC and keyname in TESTVARS can be matched to keyname in PROJID.

STEP 4: Use K-Text (the KnowledgeMan text processing component) to create a text file to contain the search and retrieval procedure. Type **TEXT**. At the "File Name?" prompt, type `"\\SRWCPRPT\\TESTLOC"`. (The name of this file is TESTLOC and it will be stored in the SRWCPRPT directory.) This method of file creation will assure that all report-generating procedures will be stored in the \\SRWCPRPT directory. The quotes must surround the file name. Press the "enter" key to start inserting text.

STEP 5: Open each table for use and index that table on the field(s) which matches the field(s) in the other file to facilitate faster retrieval. The table with the most records does not have to be indexed. When more than one file is in use during a session, full qualified field names should be used, meaning add the file name to the field name so that KnowledgeMan knows which table contains the field.

```
USE "\\SRWCPDAT\\TESTVARS"
```

```
USE "\\SRWCPDAT\\SITELOC"
```

```
INDEX "\\SRWCPDAT\\SITELOC" FOR SITELOC BY SITELOC.SITE
```

```
USE "\\SRWCPDAT\\PROJID"
```

```
INDEX "\\SRWCPDAT\\PROJID" FOR PROJID BY PROJID.KEYNAME
```

The INDEX command creates a separate file which points to the records containing the selected fields in the original table. Data tables can be indexed on more than one field, the difficulty lies in trying to pick the right combination to ensure a unique pointer so that a one-to-one record match between tables will occur in a later step in the procedure.

STEP 6: Set the environment variables. See pages 2:8-2:10 in the KnowledgeMan Reference Manual for a complete listing of all available environment variables. The ones needed for this report are as follows:

E.PWID=240	Set printer page width to 240 characters
E.STAT=FALSE	Turn off display of statistics
PRINT CHR(15)	Turn on compressed print

STEP 7: Add a heading and date stamp to aid in identifying the report.

```
?*LOCATION AND TYPE OF TESTS*
?#DATE
```

STEP 8: Select the fields. List them in the order to be displayed. To enhance the style of the report, determine the field size by looking at the associated "picture" in the Database Key. A picture indicates the number of digits or characters that a field variable occupies and the variable type. A "d" indicates that the variable contains numeric information; "r" indicates that the variable contains any alphanumeric character. If the size of the field is smaller than the size of the field name, increase the presentation size by specifying a picture. Instead of entering "rrrrrrr" to indicate an 8-character string picture, a percent sign (%) followed by the number and character type can be used. All pictures must be enclosed in double quotes. Note the use of a "\" at the end of each line in the example that follows. This is the continuation character and indicates that the command is not finished.

```
SELECT PROJID.INSTITUT, SITELOC.STATE, SITELOC.COUNTY,\
SITELOC.SITE, SITELOC.AREAPLTD, \
TESTVARS.TESTNAME, TESTVARS.SPECIES,\
TESTVARS.PROVNC USING "%8R"\
TESTVARS.CLONES USING "%8R"\
TESTVARS.ESTBMTHD USING "%8R"\
TESTVARS.FERTILTY USING "%8R"\
TESTVARS.IRRIGATN USING "%8R"\
TESTVARS.CULTVATN USING "%8R"\
TESTVARS.WSTWATER USING "%8R"\
TESTVARS.HERBICID USING "%8R"\
TESTVARS.SPACING USING "%8R"\
TESTVARS.ROTLNGTH USING "%8R"\
TESTVARS.HARVMTHD USING "%8R"\
TESTVARS.HARVDATE USING "%8R"\
TESTVARS.N2FXSPEC USING "%8R"
```

STEP 9: Specify the tables in which these fields can be found; put the table containing the most records first. Use the PLUCK command to indicate which fields should be matched to fields in other tables. This is where the index files come into play. The PLUCK command only works on tables that have been previously indexed.

```
FROM TESTVARS,\
FROM SITELOC PLUCK TESTVARS.SITE,\
FROM PROJID PLUCK SITELOC.KEYNAME
```

In this example, the TESTVARS table will be searched, starting with record 1. The value of the SITE field in a record in the TESTVARS table is then used to quickly locate a record

containing the same value in the SITE field in the SITELOC table via the PLUCK command. The value of the KEYNAME field in the record found in the SITELOC table is then matched to the same value in the KEYNAME field in the PROJID table. Matching values of the SITE field from one table to another in this manner is the equivalent of saying "FOR TESTVARS.SITE=SITELOC.SITE", but is much faster.

STEP 10: Specify the sorting sequence to customize the output arrangement of the data. If no sort sequence is stipulated, output is displayed in the order of record input. The command for sorting the data is

ORDER BY SITELOC.STATE SITELOC.COUNTY

STEP 11: Debug the procedure by first saving the text file to disk as follows:

Press the "escape" key; at the command prompt, type **WRITE**. Exit the file temporarily: press the "escape" key; at the command prompt, type **BYE** to return to KnowledgeMan command mode. Type **E.STEP=TRUE** to echo the computer's progression through the procedure to the screen and **E.PAUS=TRUE** to display only one screen at a time. Type **PERFORM "\\SRWCPRPT\\TESTLOC"** to run the program.

If an error is found, a KnowledgeMan error message will appear next to that error and processing will stop, although the remainder of the procedure is echoed to the screen. Make note of the error and return to the file by typing **TEXT**. Find the mistake in the file and correct it. Save the file to disk (**WRITE**), exit temporarily (**BYE**) and run the program again (**PERFORM "\\SRWCPRPT\\TESTLOC"**).

STEP 12: When all the errors have been corrected and the procedure is running properly, type **E.STEP=FALSE; E.PAUS=FALSE** and reenter the file by typing **TEXT**. Add **E.OPRN=TRUE** to the list of environment variables to send the output to the printer. Add **E.OPRN=FALSE** at the end of file to turn off the printer during subsequent operations and **FINISH ALL** to close the tables.

A complete listing of this procedure follows.

```
USE "\\SRWCPDAT\\TESTVARS"
USE "\\SRWCPDAT\\SITELOC"
INDEX "\\SRWCPDAT\\SITELOC" FOR SITELOC BY SITELOC.SITE
USE "\\SRWCPDAT\\PROJID"
INDEX "\\SRWCPDAT\\PROJID" FOR PROJID BY PROJID.KEYNAME
E.PWID=240; E.STAT=FALSE; PRINT CHR(15); E.OPRN = TRUE
?"LOCATION AND TYPE OF TESTS"
?#DATE
SELECT PROJID.INSTITUT, SITELOC.STATE, SITELOC.COUNTY,\
SITELOC.SITE, SITELOC.AREAPLTD, TESTVARS.TESTNAME,\
TESTVARS.SPECIES, TESTVARS.PROVNC USING "%8R"\  

TESTVARS.CLONES USING "%8R"\  

TESTVARS.ESTBMTHD USING "%8R"\  

TESTVARS.FERTILITY USING "%8R"\  

TESTVARS.IRRIGATN USING "%8R"\  

TESTVARS.CULTVATN USING "%8R"\  

TESTVARS.WSTWATER USING "%8R"\  

TESTVARS.HERBICID USING "%8R"\  

TESTVARS.SPACING USING "%8R"\  

TESTVARS.ROTLNGTH USING "%8R"\  


```



```

TESTVARS.HARVMTHD USING "%8R"
TESTVARS.HARVDATE USING "%8R"
TESTVARS.N2FXSPEC USING "%8R"
FROM TESTVARS,\
FROM SITELOC PLUCK TESTVARS.SITE\
FROM PROJID PLUCK SITELOC.KEYNAME \
ORDER BY SITELOC.STATE SITELOC.COUNTY
E.OPRN=FALSE
FINISH ALL

```

The files that have been developed for the reports in the Miscellaneous Reports and Programs option of the SRWCP database management system can be used as templates for other procedures. A listing of these files can be found in Appendix A; the files usually have "rep" as part of the file name.

To use one of these files to create a new procedure, invoke K-Text by typing **TEXT**. Press the "escape" key and at the prompt, type **WRITE** `"\\SRWCPRPT\\NEWFILENAME"` where newfilename is the name of the new file being created. Press the "escape" key and at the prompt, type **INSERT** `"\\SRWCPRPT\\FILENAME"` where filename is one of the existing report-generating files. This new file can then be modified and saved using the above procedures. Do not modify an existing report-generating file.

4.5 MODIFYING TABLES

Only users with write access (as determined by the SRWCP staff) to a table may modify the table itself or the information contained in that table. The information contained in this section is not applicable to users with "read only access."

4.5.1 Creating New Records

After a table has been opened for use, the **CREATE** command can be used to add new records. To issue the command, type

```
CREATE.
```

The same forms which are used by the SRWCP Database Management System can be accessed through the KnowledgeMan command language as an alternative to the standard KnowledgeMan record creation format. Use of these forms for adding records is preferable because the field names are written out rather than just the field code names, the order of the field display is more coherent in terms of data grouping, and the forms have built-in error checking for input values.

Using a form is a two-step process. The first step consists of loading the file with the form into memory. The command can take one of two formats. To load a form which has been saved as an executable (.ipf) file, type

```
PERFORM "\\SRWCPIPF\\FILENAME" (e.g., PERFORM "\\SRWCPIPF\\YRYLDTRT").
```

To load a tokenized form (i.e., an .icf file which doesn't have to be interpreted by the computer), type

LOAD FROM ^\SRWCPIPF\FILENAME^ WITH *F* (e.g., **LOAD FROM ^\SRWCPIPF\YRYLDTRT^ WITH *F***).

The *f* option indicates that only variables associated with form definition are loaded into memory. The PERFORM command is used if the form has been saved in an executable (.IPF) file. The LOAD FROM command is used if the form has been saved in a tokenized context (.ICF) file.

The second step is to issue the CREATE command and name the form to be used:

CREATE WITH FORMNAME (e.g., **CREATE WITH YRYLDTRT**).

4.5.2 Deleting Records

Records in any of the tables can be deleted without destroying the integrity of the table or necessitating a reload of the system. Record deletion is a three-step process: the table must be in use; the record to be deleted must be marked; and the table must be compressed to remove the marked records from the table. Users with "read only access" may not delete records.

Records can be marked based on certain conditions or by specifying a range of record numbers. To delete all the records from the site location table having a value of "Crabb" in the keyname field and a value of "Kauai" in the site field, type

MARK RECORDS IN SITELOC WITH TRUE FOR KEYNAME="CRABB" AND SITE="KAUI".

To delete a single record (i.e., record number 433), type

MARK RECORDS IN SITELOC WITH TRUE RANGE 433,433.

To delete a range of records (i.e., record numbers 433-501), type

MARK RECORDS IN SITELOC WITH TRUE RANGE 433,501.

It is not possible to mark nonconsecutive records (e.g., record numbers 433, 435, 600) in a single command. KnowledgeMan sees 433,435 as a range of records and would mark records 433, 434, and 435 for later deletion. Once all the desired records are marked, the table must be compressed. The compress command is entered as

COMPRESS SITELOC.

4.5.3 Changing Data Values in a Field

It sometimes becomes necessary to change the data values in a field for many records based on new information or modifications in the coding scheme. Altering many records at one time is known as a "global change". To accomplish this, the CHANGE command is used. For

example, suppose that the test name code in the treatment size and spacing file should be changed to "Spacing" from "Density". To initiate this change, type

CHANGE TESTNAME IN TRTSIZSP TO "SPACING" FOR TESTNAME="DENSITY".

Many times not all the data values in a field need to be modified, just those having to do with a specific project. For example, if new information became available that indicated that the data reported for the Spacing test at Florida State (keyname for the project is "rockwood") was actually for calendar year 1986 and not 1987 in the yearly maintenance by herbicide (YRMNTHB) file, the following command would be used:

CHANGE CALENYR IN YRMNTHB TO "1986" FOR CALENYR="1987" AND TESTNAME="SPACING" AND KEYNAME="ROCKWOOD".

Although 1986 is composed of numbers, the calenyrr field is actually an alphanumeric field and not a numeric one. Therefore, when retrieving information based on the values of this field, it must be enclosed in double quotes just like the values of other text fields.

4.6 CONVERTING A TABLE TO A SPECIAL FORMAT

One of KnowledgeMan's strengths is its ability to convert table data to other formats such as KnowledgeMan spreadsheets, DIF format, and several types of ASCII files for use with other software packages. The KnowledgeMan Reference Manual contains a complete discussion of each of these options and procedures. The operation of the CONVERT command is very similar to the SELECT command--fields must be listed in output order, limiting criteria can be specified, and a sorting sequence can be chosen. Descriptions of several of the most common "convert" procedures follow.

4.6.1 KnowledgeMan Table to KnowledgeMan Spreadsheet

This section presents one method of importing data from a table to a KnowledgeMan spreadsheet. A spreadsheet format is useful for viewing several records simultaneously from a single table and for making calculations using data from one or more tables. A spreadsheet can also be used as an intermediate step for quickly generating graphics from the database either with KnowledgeMan or with other software such as Lotus 1-2-3² or Freelance Plus³. Only 255 records can be imported, because 255 is the maximum number of rows permitted in a KnowledgeMan spreadsheet. Thus, the number of records retrieved should be limited using a FOR clause described in the previous sections.

The default size of a KnowledgeMan spreadsheet is 30 columns and 30 rows, but it can have up to 255 columns and 255 rows. To create an active KnowledgeMan spreadsheet, at the KnowledgeMan prompt, type **CALC**. The size of the spreadsheet can be specified in the CALC command. To create a spreadsheet of 255 rows by 10 columns, type **CALC 255,10**.

²Lotus 1-2-3 is a registered trademark of Lotus Development Corp.

³Lotus Freelance Plus is a registered trademark of Lotus Development Corp.

At the spreadsheet status line, type `\USE *\SRWCPDAT\FILENAME*` (all KnowledgeMan commands can be issued from within a spreadsheet, but must be preceded by a "\") if the file containing the data to be converted is not currently in use. Then type `\TEXT FILENAME` to invoke K-TEXT to create a file to contain the procedures to convert the data from the table to the spreadsheet. The command syntax for this operation is

```

CONVERT    FIELDNAME, FIELDNAME, FIELDNAME FROM FILENAME FOR
              CONDITIONS TO CELL #XN, ORDER DIRECTION FIELDNAME,
              FIELDNAME

```

where X is the column coordinate and N is the row coordinate for beginning placement of the data in the spreadsheet. The default value, 0, of the environment conversion variable, e.cf, is used. An example, using real field names, follows.

```

CONVERT    SITE, TESTNAME, TREATMNT FROM TRTSIZSP FOR BIOYIELD NE 0
              AND CALENYR='1986' TO CELL #A5, ORDER AZ BIOYIELD

```

Press the "escape" key and type **STOP** to save the file. Upon exiting from K-Text, the user is returned to spreadsheet which may need to be redrawn on the screen. Hit the "\" key and the "enter" key to redraw the spreadsheet. At the spreadsheet status line, type `\PERFORM FILENAME*` to invoke the procedure to enter the data into the spreadsheet. More experienced users can issue all the commands from within the spreadsheet itself without invoking the text editor.

The example given above imports data from only one table into a KnowledgeMan spreadsheet. For calculations or graphs it may be necessary to access data in two or more tables. A more elaborate **CONVERT** command can be structured similarly to the **SELECT** command used in generating reports from more than one table (see Section 4.4). A wide range of functions is available in KnowledgeMan to allow complex calculations.

To save the spreadsheet, type `\SAVE TO *\SRWCPDAT\FILENAME* WITH "C"`, thus storing the spreadsheet in the SRWCPDAT directory. An .ICF extension will be appended to the file name and only the cell definitions will be saved. If the "C" is omitted, the file will also contain the existing environment variables, and other procedures and forms currently residing in memory which might not be applicable the next time the spreadsheet is used. To exit permanently, type `\STOP`. The spreadsheet must be saved before 'stopping'.

4.6.2 KnowledgeMan Table to DIF Format for Use with Lotus 1-2-3

At the KnowledgeMan command prompt or within a procedure file, open the desired table for use. Set the environment conversion variable, e.cf, to the 1. Specify the fields to be converted and the output sort sequence. In this example, the yearly yield by treatment file will be used.

```

USE *\SRWCPDAT\YRYLDTRT*
E.CF=1
CONVERT    KEYNAME, SITE, TESTNAME, TREATMNT, CALENYR,\
              ROTATION, GROWTHYR, BIOYIELD,\
              TO *YELDDAT.DIF*,\
              ORDER BY KEYNAME, SITE, TESTNAME, TREATMNT, GROWTHYR

```

"Yielddat.dif" will contain the table data in a format that can be used by Lotus 1-2-3.

4.6.3 KnowledgeMan Table to ASCII Format for Use with SAS⁴

At the KnowledgeMan command prompt or within a procedure file, open the desired table for use. Set the environment conversion variable, e.cf, to 3. Specify the fields to be converted and the output sort sequence. In this example, the yearly yield by treatment file will be used.

```
USE "\SRWCPDAT\YRYLDTRT"  
E.CF=3  
CONVERT    KEYNAME, SITE, TESTNAME, TREATMNT, CALENYR,\  
           ROTATION, GROWTHYR, BIOYIELD\  
           TO "YELDDAT.TXT",\  
           ORDER BY KEYNAME, SITE, TESTNAME, TREATMNT, GROWTHYR
```

"Yielddat.txt" will contain the table data in a format that can be used by SAS.

⁴SAS is a registered trademark of SAS Institute, Inc.

5. SOURCE CODE FOR SRWCP DATABASE MANAGEMENT SYSTEM

This section contains the source code for the SRWCP Database Management System as it currently exists (June 1988). The procedures may be revised later as new techniques are developed.

5.1 DATA MANAGEMENT PROCEDURE SOURCE CODE

5.1.1 STARTUP.IPF - SRWCP Database Management System Startup Procedure

This procedure controls entry into the SRWCP Database Management System. The user is asked if he/she wants to use the customized menu system or go directly into the KnowledgeMan command mode. It also initializes several environment variables. It is the main operating procedure with "choice" being a string input variable. If choice="y" then BEGINN.IPF is called.

```
/* Retrieve the initial control screen. Unless user types "Y", the SRWCP Database Management System will not be entered */
```

```
choice=""; clear; load from start2.icf with "f"
putform newform; tally newform; getform newform
```

```
if choice="Y" then
  clear
  perform "\\kman\\beginn.ipf"
else
  release all
  clear
endif
```

```
/* Initialize environment variables */
e.stat=false      !turn off statistical summaries
e.deci=4          !set decimal display to 4 places
e.istr=60         !set alphanumeric display to 60 characters
```

5.1.2 BEGINN.IPF - Main Control Procedure

This procedure controls the process of entering and retrieving data from the SRWCP database. It acts as a buffer between the user of the system and the KNOWLEDGEMAN DBMS. This procedure calls other procedures (BIOFORM.IPF, BRCRPROC.IPF, SPECLRPT.IPF, CONTBR.IPF, CONTCR.IPF) depending upon the function (an integer input variable) requested by the user.

```
/* Retrieve the function select menu from disk 'B'; set up an infinite while loop which will be exited via a user request through the variable 'functn' when 'functn'=5 or 6. */
```

```
At 11,11 ? "Initialization of KMAN system for Biomass Program"
  using "%50r"
At 12,11 ? "in progress. Please stand by."
  using "%30r"
```

```
load perform "brcrproc.ipf"; load perform "brcrscrn.ipf"
load from "bioform" with "f"; load perform "contbr.ipf"
```

```

load perform "conctr.ipf"
let forever=true
while forever=true do

/* Paint the initial function select menu onto the screen and retrieve the function variable 'functn' input by the user.
*/
putform bioform; getform bioform

/* Test the value of the input variable input by the user and perform the respective sub-procedure. */

test functn
  case 1: /* Update existing SRWCP data ('functn'=1) */
    perform "brcrproc.ipf"; continue
  case 2: /* Input new SRWCP data ('functn'=2) */
    if #user="biomass" then
      perform "brcrproc.ipf"
    else ? "Write access to files denied"
      ?"press any key to continue";wait
    endif
    continue
  case 3: /* Generate special SRWCP report ('functn'=3) */
    perform "brcrproc.ipf"
    continue
  case 4: /* Select a report or utility program ('functn'=4) */
    perform "speclrpt.ipf"
    continue
  case 5: /* Enter KNOWLEDGEMAN command language mode */
    release all
    stop /* ('functn'=5) */
  case 6: /* Enter KNOWLEDGEMAN menu-guided interface ('functn'=6) */
    release all; e.guid=true
    stop
  case 7: /* Return to DOS */
    bye
endtest

/* Go to top of while loop for another iteration of displaying the initial function menu and performing the requested
operation. */

endwhile

```

5.1.3 Form for SRWCP Main Menu

```

FORM BIOFORM
  AT 2, 33 PUT "SRWCP DATABASE"
  AT 3, 26 PUT "MAIN MENU"
  AT 6, 15 PUT "BROWSE THROUGH THE SRWCP DATABASE.....1"
  AT 8, 15 PUT "INPUT DATA INTO THE SRWCP DATABASE.....2"
  AT 10, 15 PUT "EXTRACT DATA OR REPORT FROM SRWCP DATABASE.....3"
  AT 12, 15 PUT "MISCELLANEOUS PROGRAMS AND REPORTS.....4"
  AT 14, 15 PUT "ENTER KNOWLEDGEMAN COMMAND LANGUAGE MODE.....5"
  AT 16, 15 PUT "ENTER KNOWLEDGEMAN MENU-GUIDED INTERFACE.....6"
  AT 18, 15 PUT "EXIT SYSTEM AND RETURN TO DOS.....7"
  AT 24, 3 PUT "Please Select Function" WITH "L"
  AT 24, 26 GET FUNCTN NUM USING "d"
  AT 24, 26 PUT FUNCTN USING "d"
  AT i, 1 TO 25, 80 PUT "FWBU"
  AT 5, 12 TO 21, 67 PUT "FWBA"
ENDFORM

```


5.1.4 BRCRPROC.IPF - Update/Input/Report Control Procedure

This procedure controls the process of updating and entering data into the SRWCP database as well as generating some simple reports. It acts as a buffer between the user of the system and the KNOWLEDGEMAN DBMS. The routine functions by painting a menu onto the screen and prompting the user to input the file for which data input, update or reporting is requested, using the "tblchoic" integer variable. The procedure retrieves the file and allows the user to input data into the file, browse the data in the file and update the data, or generate a simple report for the file. These interrogations are performed using the standard BROWSE, CREATE, or SELECT functions implemented by KNOWLEDGEMAN. Upon completion of any one file session, the user is asked if he/she wants to continue. An answer of "Yes" will cause the next file in the database to be selected. A "No" answer will cause the initial file select menu to be displayed and the user can select another file in the SRWCP database or the user can stop altogether and return to the main menu by entering a "0", "functn" being the variable input in BEGINN.IPF. This procedure calls other procedures depending upon the function requested by the user, BRCRSCRN.IPF, CONTBR.IPF, CONTRPT.IPF, CONTRPT.IPF.

```
/* Retrieve the file select menu from hard disk; set up an infinite while loop which will be exited via a user request
through the variable 'tblchoic' when 'tblchoic='0'. In addition, retrieve the continuation menu to be displayed upon
completion of each file session. */
```

```
include "brcrscrn.ipf"; include "contbr.ipf"
include "conctr.ipf"; include "contrpt.ipf"
let forever=true
while forever=true do
```

```
/* Paint the file select menu on the screen and request the user to input the desired file. This file can be any one of
the 32 files in the SRWCP database. */
putform brcrscrn; getform brcrscrn
```

```
/* If the choice input by the user, 'tblchoic', is zero, then return from this procedure to the main procedure
(BEGINN.IPF). */
if tblchoic = 0 then return; endif
```

```
/* Test the value of 'tblchoic' input by the user. Retrieve the appropriate file and either allow input, update, or
reporting, depending upon the value of 'functn' input by the user on the initial function menu displayed in
(BEGINN.IPF). If 'functn'=1 then allow the data to be updated. If 'functn'=2' then allow new data to be input. If
'functn'=3' then generate a report. */
```

```
test tblchoic
```

```
case 1: /*Input new or update existing data in the PROJECT IDENTIFICATION file. */
```

```
load "\\srwcpipf\projid" with "f"; use "\\srwcpdat\projid"
```

```
test functn
```

```
case 1:
```

```
    browse projid with projid
```

```
    putform contbr; getform contbr; break
```

```
case 2:
```

```
    create record for projid with projid
```

```
    putform conctr; getform conctr; break
```

```
case 3:
```

```
    perform "\\srwcpcpt\file1"
```

```
    putform contrpt; getform contrpt
```

```
endtest
```

```
if inuse("projid")=true then finish projid; endif
```

```
release projid
```

```
if contin ="N" then continue; endif
```

```
case 2: /* Input new or update existing data in the PRIMARY INVESTIGATOR file. */
```

```
load "\\srwcpipf\priminv" with "f"; use "\\srwcpdat\priminv"
```

```
test functn
```

```
case 1:
```

```

        browse priminv with priminv
        putform contbr; getform contbr;break
    case 2:
        create record for priminv with priminv
        putform contcr; getform contcr; break
    case 3:
        perform "\\srwcp\prpt\file2"
        putform contrpt; getform contrpt
    endtest
    if inuse("priminv")=true then finish priminv;endif
    release priminv
    if contin ="N" then continue; endif
case 3: /* Input new or update existing data in the YIELD ESTIMATES file. */
load "\\srwcp\pipf\projdsc1" with "f"; use "\\srwcp\dat\projdsc1"
test functn
    case 1:
        browse projdsc1 with projdsc1
        putform contbr; getform contbr;break
    case 2:
        create record for projdsc1 with projdsc1
        putform contcr; getform contcr;break
    case 3:
        perform "\\srwcp\prpt\file3"
        putform contrpt; getform contrpt
    endtest
    if inuse("projdsc1")=true then finish projdsc1;endif
    release projdsc1
    if contin ="N" then continue; endif
case 4: /* Input new or update existing data in the PROJECT TYPE OF RESEARCH file. */
load "\\srwcp\pipf\projdsc2" with "f"; use "\\srwcp\dat\projdsc2"
test functn
    case 1:
        browse projdsc2 with projdsc2
        putform contbr; getform contbr; break
    case 2:
        create record for projdsc2 with projdsc2
        putform contcr; getform contcr; break
    case 3:
        perform "\\srwcp\prpt\file4"
        putform contrpt; getform contrpt
    endtest
    if inuse("projdsc2")=true then finish projdsc2;endif
    release projdsc2
    if contin ="N" then continue; endif
case 5: /* Input new or update existing data in the SITE LOCATION file. */
load "\\srwcp\pipf\siteloc" with "f"; use "\\srwcp\dat\siteloc"
test functn
    case 1:
        browse siteloc with siteloc
        putform contbr; getform contbr; break
    case 2:
        create record for siteloc with siteloc
        putform contcr; getform contcr; break
    case 3:
        perform "\\srwcp\prpt\file5"
        putform contrpt; getform contrpt
    endtest
    if inuse("siteloc")=true then finish siteloc;endif
    release siteloc
    if contin ="N" then continue; endif
case 6: /* Input new or update existing data in the SITE AVERAGE CLIMATE file. */
load "\\srwcp\pipf\siteac" with "f"; use "\\srwcp\dat\siteac"
test functn
    case 1:

```

```

        browse siteac with siteac
        putform contbr; getform contbr; break
    case 2:
        create record for siteac with siteac
        putform contcr; getform contcr; break
    case 3:
        perform "\\srwcpdprpt\\file6"
        putform contrpt; getform contrpt
    endtest
    if inuse("siteac")=true then finish siteac; endif
    release siteac
    if contin ="N" then continue; endif
case 7: /* Input new or update existing data in the SITE QUALITY file. */
    load "\\srwcpipf\\siteq" with "P"; use "\\srwcpdat\\siteq"
    test functn
        case 1:
            browse siteq with siteq
            putform contbr; getform contbr; break
        case 2:
            create record for siteq with siteq
            putform contcr; getform contcr; break
        case 3:
            perform "\\srwcpdprpt\\file7"
            putform contrpt; getform contrpt
    endtest
    if inuse("siteq")=true then finish siteq;endif
    release siteq
    if contin ="N" then continue; endif
case 8: /* Input new or update existing data in the SOIL CHEMISTRY file. */
    load "\\srwcpipf\\soilc" with "F"; use "\\srwcpdat\\soilc"
    test functn
        case 1:
            browse soilc with soilc
            putform contbr; getform contbr; break
        case 2:
            create record for soilc with soilc
            putform contcr; getform contcr; break
        case 3:
            perform "\\srwcpdprpt\\file8"
            putform contrpt; getform contrpt
    endtest
    if inuse("soilc")=true then finish soilc;endif
    release soilc
    if contin ="N" then continue; endif
case 9: /* Input new or update existing data in the SOIL PHYSICS file. */
    load "\\srwcpipf\\soilp" with "F"; use "\\srwcpdat\\soilp"
    test functn
        case 1:
            browse soilp with soilp
            putform contbr; getform contbr; break
        case 2:
            create record for soilp with soilp
            putform contcr; getform contcr; break
        case 3:
            perform "\\srwcpdprpt\\file9"
            putform contrpt; getform contrpt
    endtest
    if inuse("soilp")=true then finish soilp;endif
    release soilp
    if contin ="N" then continue; endif
case 10: /* Input new or update existing data in the SITE TYPE file. */
    load "\\srwcpipf\\sitetyp" with "F"; use "\\srwcpdat\\sitetyp"
    test functn
        case 1:

```

```

        browse sitetyp with sitetyp
        putform contbr; getform contbr; break
    case 2:
        create record for sitetyp with sitetyp
        putform contcr; getform contcr; break
    case 3:
        perform "\\srwcpdprpt\\file10"
        putform contrpt; getform contrpt
    endtest
    if inuse("sitetyp")=true then finish sitetyp;endif
    release sitetyp
    if contin = "N" then continue; endif
case 11: /* Input new or update existing data in the YEARLY RAINFALL AND TEMPERATURE DATA file. */
    load "\\srwcpipf\\raintemp" with "f"; use "\\srwcpdat\\raintemp"
    test functn
        case 1:
            browse raintemp with raintemp
            putform contbr; getform contbr; break
        case 2:
            create record for raintemp with raintemp
            putform contcr; getform contcr; break
        case 3:
            perform "\\srwcpdprpt\\file11"
            putform contrpt; getform contrpt
    endtest
    if inuse("raintemp")=true then finish raintemp;endif
    release raintemp
    if contin = "N" then continue; endif
case 12: /* Input new or update existing data in the TEST DESIGN file. */
    load "\\srwcpipf\\testdesn" with "f"; use "\\srwcpdat\\testdesn"
    test functn
        case 1:
            browse testdesn with testdesn
            putform contbr; getform contbr; break
        case 2:
            create record for testdesn with testdesn
            putform contcr; getform contcr; break
        case 3:
            perform "\\srwcpdprpt\\file12"
            putform contrpt; getform contrpt
    endtest
    if inuse("testdesn") then finish testdesn;endif
    release testdesn
    if contin = "N" then continue; endif
case 13: /* Input new or update existing data in the TEST VARIABLES file. */
    load "\\srwcpipf\\testvars" with "f"; use "\\srwcpdat\\testvars"
    test functn
        case 1:
            browse testvars with testvars
            putform contbr; getform contbr; break
        case 2:
            create record for testvars with testvars
            putform contcr; getform contcr; break
        case 3:
            perform "\\srwcpdprpt\\file13"
            putform contrpt; getform contrpt
    endtest
    if inuse("testvars")=true then finish testvars;endif
    release testvars
    if contin = "N" then continue; endif
case 14: /* Input new or update existing data in the TREATMENT SIZE/SPACING file. */
    load "\\srwcpipf\\trtsizsp" with "f"; use "\\srwcpdat\\trtsizsp"
    test functn
        case 1:

```

```

        browse trtsizsp with trtsizsp
        putform contbr; getform contbr; break
    case 2:
        create record for trtsizsp with trtsizsp
        putform contcr; getform contcr; break
    case 3:
        perform "\\srwcp rpt\\file14"
        putform contrpt; getform contrpt
    endtest
    if inuse("trtsizsp")=true then finish trtsizsp;endif
    release trtsizsp
    if contin ="N" then continue; endif
case 15: /* Input new or update existing data in the SITE PREPARATION file. */
load "\\srwcpipf\\siteprep" with "f"; use "\\srwcpdat\\siteprep"
test functn
    case 1:
        browse siteprep with siteprep
        putform contbr; getform contbr; break
    case 2:
        create record for siteprep with siteprep
        putform contcr; getform contcr; break
    case 3:
        perform "\\srwcp rpt\\file15"
        putform contrpt; getform contrpt
    endtest
    if inuse("siteprep")=true then finish siteprep;endif
    release siteprep
    if contin ="N" then continue; endif
case 16: /* Input new or update existing data in the TREATMENT PLANTING STOCK SOURCE file. */
load "\\srwcpipf\\trtps1" with "f"; use "\\srwcpdat\\trtps1"
test functn
    case 1:
        browse trtps1 with trtps1
        putform contbr; getform contbr; break
    case 2:
        create record for trtps1 with trtps1
        putform contcr; getform contcr; break
    case 3:
        perform "\\srwcp rpt\\file16"
        putform contrpt; getform contrpt
    endtest
    if inuse("trtps1") then finish trtps1;endif
    release trtps1
    if contin ="N" then continue; endif
case 18: /* Input new or update existing data in the YEARLY MAINTENANCE BY TREATMENT file. */
load "\\srwcpipf\\yrmntrt1" with "f"; use "\\srwcpdat\\yrmntrt1"
test functn
    case 1:
        browse yrmntrt1 with yrmntrt1
        putform contbr; getform contbr; break
    case 2:
        create record for yrmntrt1 with yrmntrt1
        putform contcr; getform contcr; break
    case 3:
        perform "\\srwcp rpt\\file18"
        putform contrpt; getform contrpt
    endtest
    if inuse("yrmntrt1")=true then finish yrmntrt1;endif
    release yrmntrt1
    if contin ="N" then continue; endif
case 19: /* Input new or update existing data in the YEARLY MAINTENANCE (HERBICIDE) file. */
load "\\srwcpipf\\yrmnthb" with "f"; use "\\srwcpdat\\yrmnthb"
test functn
    case 1:

```

```

        browse yrmnthb with yrmnthb
        putform contbr
        getform contbr;break
    case 2:
        create record for yrmnthb with yrmnthb
        putform contcr; getform contcr; break
    case 3:
        perform "\\srwcpdprpt\\file19"
        putform contrpt; getform contrpt
    endtest
    if inuse("yrmnthb")=true then finish yrmnthb;endif
    release yrmnthb
    if contin ="N" then continue; endif
case 20: /* Input new or update existing data in the YEARLY MAINTENANCE (FERTILIZATION) FILE. */
    load "\\srwcpipf\\yrmntff" with "f"; use "\\srwcpdat\\yrmntff"
    test functn
        case 1:
            browse yrmntff with yrmntff
            putform contbr; getform contbr; break
        case 2:
            create record for yrmntff with yrmntff
            putform contcr; getform contcr; break
        case 3:
            perform "\\srwcpdprpt\\file20"
            putform contrpt; getform contrpt
    endtest
    if inuse("yrmntff")=true then finish yrmntff;endif
    release yrmntff
    if contin ="N" then continue; endif
case 21: /* Input new or update existing data in the YEARLY MAINTENANCE (PEST CONTROL) FILE. */
    load "\\srwcpipf\\yrmntpc" with "f"; use "\\srwcpdat\\yrmntpc"
    test functn
        case 1:
            browse yrmntpc with yrmntpc
            putform contbr; getform contbr; break
        case 2:
            create record for yrmntpc with yrmntpc
            putform contcr; getform contcr; break
        case 3:
            perform "\\srwcpdprpt\\file21"
            putform contrpt; getform contrpt
    endtest
    if inuse("yrmntpc")=true then finish yrmntpc;endif
    release yrmntpc
    if contin ="N" then continue; endif
case 22: /* Input new or update existing data in the YEARLY MAINTENANCE (CULTIVATION) FILE. */
    load "\\srwcpipf\\yrmntct" with "f"; use "\\srwcpdat\\yrmntct"
    test functn
        case 1:
            browse yrmntct with yrmntct
            putform contbr; getform contbr; break
        case 2:
            create record for yrmntct with yrmntct
            putform contcr; getform contcr; break
        case 3:
            perform "\\srwcpdprpt\\file22"
            putform contrpt; getform contrpt
    endtest
    if inuse("yrmntct")=true then finish yrmntct;endif
    release yrmntct
    if contin ="N" then continue; endif
case 23: /* Input new or update existing data in the YEARLY MAINTENANCE (MOWING) file. */
    load "\\srwcpipf\\yrmntmw" with "f"; use "\\srwcpdat\\yrmntmw"
    test functn

```

```

case 1:
    browse yrmntmw with yrmntmw
    putform contbr; getform contbr; break
case 2:
    create record for yrmntmw with yrmntmw
    putform contcr; getform contcr; break
case 3:
    perform "\\srwcp rpt\file23"
    putform contrpt; getform contrpt
endtest
if inuse("yrmntmw")=true then finish yrmntmw;endif
release yrmntmw
if contin ="N" then continue; endif
case 24: /* Input new or update existing data in the YEARLY MAINTENANCE (browse CONTROL) file. */
load "\\srwcpipf\yrmntbc" with "f"; use "\\srwcpdat\yrmntbc"
test functn
case 1:
    browse yrmntbc with yrmntbc
    putform contbr; getform contbr; break
case 2:
    create record for yrmntbc with yrmntbc;
    putform contcr; getform contcr; break
case 3:
    perform "\\srwcp rpt\file24"
    putform contrpt; getform contrpt
endtest
if inuse("yrmntbc")=true then finish yrmntbc;endif
release yrmntbc
if contin ="N" then continue; endif
case 25: /* Input new or update existing data in the YEARLY MAINTENANCE (IRRIGATION) file. */
load "\\srwcpipf\yrmntir" with "f"; use "\\srwcpdat\yrmntir"
test functn
case 1:
    browse yrmntir with yrmntir
    putform contbr; getform contbr; break
case 2:
    create record for yrmntir with yrmntir
    putform contcr; getform contcr; break
case 3:
    perform "\\srwcp rpt\file25"
    putform contrpt; getform contrpt
endtest
if inuse("yrmntir")=true then finish yrmntir;endif
release yrmntir
if contin ="N" then continue; endif
case 26: /* Input new or update existing data in the YEARLY MAINTENANCE (LIMING) file. */
load "\\srwcpipf\yrmntlm" with "f"; use "\\srwcpdat\yrmntlm"
test functn
case 1:
    browse yrmntlm with yrmntlm
    putform contbr; getform contbr; break
case 2:
    create record for yrmntlm with yrmntlm
    putform contcr; getform contcr; break
case 3:
    perform "\\srwcp rpt\file26"
    putform contrpt; getform contrpt
endtest
if inuse("yrmntlm")=true then finish yrmntlm;endif
release yrmntlm
if contin ="N" then continue; endif
case 27: /* Input new or update existing data in the WOOD QUALITY CHARACTERISTICS file. */
load "\\srwcpipf\woodqual" with "f"; use "\\srwcpdat\woodqual"
test functn

```

```

case 1:
    browse woodqual with woodqual
    putform contbr; getform contbr; break
case 2:
    create record for woodqual with woodqual
    putform contcr; getform contcr; break
case 3:
    perform "\\srwcp rpt\\file27"
    putform contrpt; getform contrpt
endtest
if inuse("woodqual")=true then finish woodqual;endif
release woodqual
if contin ="N" then continue; endif
case 28: /* Input new or update existing data in the YEARLY HARVEST INFORMATION file. */
load "\\srwcpipf\yrharvin" with "f"; use "\\srwcpdat\yrharvin"
test functn
case 1:
    browse yrharvin with yrharvin
    putform contbr; getform contbr; break
case 2:
    create record for yrharvin with yrharvin
    putform contcr; getform contcr; break
case 3:
    perform "\\srwcp rpt\\file28"
    putform contrpt; getform contrpt
endtest
if inuse("yrharvin")=true then finish yrharvin;endif
release yrharvin
if contin ="N" then continue; endif
case 29: /* Input new or update existing data in the YEARLY HARVEST METHODS file. */
load "\\srwcpipf\yrharvmd" with "f"; use "\\srwcpdat\yrharvmd"
test functn
case 1:
    browse yrharvmd with yrharvmd
    putform contbr; getform contbr; break
case 2:
    create record for yrharvmd with yrharvmd
    putform contcr; getform contcr; break
case 3:
    perform "\\srwcp rpt\\file29"
    putform contrpt; getform contrpt
endtest
if inuse("yrharvmd")=true then finish yrharvmd;endif
release yrharvmd
if contin ="N" then continue; endif
case 30: /* Input new or update existing data in the YEARLY YIELD BY TEST file.*/
load "\\srwcpipf\yryldtst" with "f"; use "\\srwcpdat\yryldtst"
test functn
case 1:
    browse yryldtst with yryldtst
    putform contbr; getform contbr; break
case 2:
    create record for yryldtst with yryldtst
    putform contcr; getform contcr; break
case 3:
    perform "\\srwcp rpt\\file30"
    putform contrpt
    getform contrpt
endtest
if inuse("yryldtst")=true then finish yryldtst;endif
release yryldtst
if contin ="N" then continue; endif
case 31: /* Input new or update existing data in the YEARLY YIELD BY TREATMENT file. */
load "\\srwcpipf\yryldtrt" with "f"; use "\\srwcpdat\yryldtrt"

```



```

test functn
  case 1:
    browse yryldtrt with yryldtrt
    putform contbr; getform contbr; break
  case 2:
    create record for yryldtrt with yryldtrt
    putform contcr; getform contcr; break
  case 3:
    perform "\\srwcp\prpt\file31"
    putform contrpt; getform contrpt
endtest
if inuse("yryldtrt")=true then finish yryldtrt;endif
release yryldtrt
if contin ="N" then continue; endif
case 32: /* Input new or update existing data in the YEARLY BIOMASS EQUATIONS file. */
load "\\srwcp\pipf\yrbioequ" with "F"; use "\\srwcp\dat\yrbioequ"
test functn
  case 1:
    browse yrbioequ with yrbioequ
    putform contbr; getform contbr; break
  case 2:
    create record for yrbioequ with yrbioequ
    putform contcr; getform contcr; break
  case 3:
    ? "Report under Development"
    putform contrpt; getform contrpt
endtest
if inuse("yrbioequ") then finish yrbioequ;endif
release yrbioequ
if contin ="N" then continue; endif
case 33: /* Input new or update existing data in the COMMENTS file. */
load "\\srwcp\pipf\comments" with "F"; use "\\srwcp\clat\comments"
test functn
  case 1:
    browse comments with comments
    putform contbr; getform contbr; break
  case 2:
    create record for comments with comments
    putform contcr; getform contcr; break
  case 3:
    perform "\\srwcp\prpt\file32"
    putform contrpt; getform contrpt
endtest
if inuse("comments")=true then finish comments;endif
release comments
if contin ="N" then continue; endif
endtest
/* Return to the top of the while loop for another iteration. Redisplay the file-select screen and ask for the file to be
modified. */
endwhile

```

5.1.5 Form for Browse, Create, or Report Screen

FORM BRCRSCRN

```

AT 2, 31 PUT " SRWCP DATABASE"
AT 3, 31 PUT " DATA FILES"
AT 5, 6 PUT "Project Identification.....1"
AT 6, 6 PUT "Primary Investigator.....2"
AT 6, 45 PUT "Yearly Maintenance/Trtmt.....18"
AT 7, 6 PUT "Yield Estimates.....3"
AT 7, 45 PUT "Yearly Maintenance (Herb.)....19"
AT 8, 6 PUT "Project Type of Research.....4"

```

```

AT 8, 45 PUT "Yearly Maintenance (Fert.)....20"
AT 9, 6 PUT "Site Location.....5"
AT 9, 45 PUT "Yearly Maintenance (Pst Ctl)..21"
AT 10, 6 PUT "Site Average Ciimate.....6"
AT 10, 45 PUT "Yearly Maintenance (Cult.)....22"
AT 11, 6 PUT "Site Quality.....7"
AT 11, 45 PUT "Yearly Maintenance (Mowing)...23"
AT 12, 6 PUT "Soil Chemistry.....8"
AT 12, 45 PUT "Yearly Maintenance (Brs Ctl)..24"
AT 13, 6 PUT "Soil Physics.....9"
AT 13, 45 PUT "Yearly Maintenance (Irrgtn)..25"
AT 14, 6 PUT "Site Type.....10"
AT 14, 45 PUT "Yearly Maintenance (Liming)...26"
AT 15, 6 PUT "Yearly Rain/Temp Metric.....11"
AT 15, 45 PUT "Wood Quality Char.....27"
AT 16, 6 PUT "Test Design.....12"
AT 16, 45 PUT "Yearly Harvest Information....28"
AT 17, 6 PUT "Test Variables.....13"
AT 17, 45 PUT "Yearly Harvest Methods.....29"
AT 18, 6 PUT "Treatment Size/Spacing.....14"
AT 18, 45 PUT "Yearly Biomass Yields/Test....30"
AT 19, 6 PUT "Site Preparation.....15"
AT 19, 45 PUT "Yearly Biomass Yields/Trtmt...31"
AT 20, 6 PUT "Trtmt. Planting Stock Source.16"
AT 20, 45 PUT "Yearly Biomass Equations.....32"
AT 21, 45 PUT "Comments.....33"
AT 24, 2 PUT "Please Select Data File to Browse/Update/Report or 0 to Stop:" WITH "L"
AT 24, 65 GET TBLCHOIC NUM USING "dd"
AT 1, 1 TO 25, 80 PUT "FWBU"
ENDFORM

```

5.1.6 Forms for Continuation Prompts

```

Form CONTBR at 24,50 to 24,80 put "br"
  at 24,40 put "Continue Browsing? Y/N:"
  at 24,64 get contin str using "u"
Endform

```

```

Form CONTCR at 24,50 to 24,80 put "br"
  at 24,40 put "Continue Creating/Updating? Y/N:"
  at 24,73 get contin str using "u"
Endform

```

5.2 EXTRACT DATA OR REPORT FROM SRWCP DATABASE

The source code for each of the reports available through the Main Menu option 3, Extract Data or Report from SRWCP Database, is not presented here in its totality. These procedures were developed using the KnowledgeMan "select" command and simply consist of a listing of the fields and the sort sequence for printing. The only thing that is not standard to KnowledgeMan is the interactive method for limiting the report to a specific project. A list of valid KEYNAMES first appears on the screen (the KEYNAME.IPF program does this process), and the user is then prompted to input the KEYNAME upon which the report should be based. If a complete file dump is desired, the user simply hits the "enter" key. A sample report-generating procedure, FILE14.IPF, which generates a report listing the spacings and areas for each treatment in each test for each site under investigation follows.

```

/* initialize environment variables */
e.stat=false; e.pwid=240
e.lstr=200; print chr(15)

/* access the procedure which limits the report to a specific project */
perform "\\srwcppt\keyname"
?#date
? "TREATMENT SIZE AND SPACING - FILE 14"
if not inuse("trtsizsp") then use "\\srwcpdat\trtsizsp";endif
if ^vname="" then
select trtsizsp.keyname, trtsizsp.site using "%8r",\
      trtsizsp.testname using "%8r", trtsizsp.treatmnt using "%12r", trtsizsp.yearpltd using "%8r", trtsizsp.termdate using
"%8r",\
      trtsizsp.mnthpltd using "%8r", trtsizsp.testarea using "dddddd.ddd", trtsizsp.blocarea using "dddddd.dd",\
      trtsizsp.trtarea using "dddddd.ddd", trtsizsp.numrepls using "%8r", trtsizsp.ttreerep using "%8r",\
      trtsizsp.famprov using "%8r", trtsizsp.tfamrep using "%8r", trtsizsp.tclonrep using "%8r", trtsizsp.tdensity using "%8r",\
      trtsizsp.odensity using "%8r", trtsizsp.wdensity using "%8r", trtsizsp.rowspace using "dddddd.dd", trtsizsp.trespace
using "dddddd.dd",\
      trtsizsp.bedspace using "%8r", trtsizsp.mapnfile using "%8r", \
order trtsizsp.keyname, trtsizsp.site, trtsizsp.yearpltd,\
      trtsizsp.testname, trtsizsp.treatmnt
else
?"Report for " ^vname
select trtsizsp.site using "%8r", trtsizsp.testname using "%8r", trtsizsp.treatmnt using "%12r", trtsizsp.yearpltd using
"%8r",\
      trtsizsp.termdate using "%8r", trtsizsp.mnthpltd using "%8r", trtsizsp.testarea using "dddddd.ddd", trtsizsp.blocarea
using "dddddd.dd",\
      trtsizsp.trtarea using "dddddd.ddd", trtsizsp.numrepls using "%8r", trtsizsp.ttreerep using "%8r", trtsizsp.famprov using
"%8r",\
      trtsizsp.tfamrep using "%8r", trtsizsp.tclonrep using "%8r", trtsizsp.tdensity using "%8r", trtsizsp.odensity using "%8r",\
      trtsizsp.wdensity using "%8r", trtsizsp.rowspace using "dddddd.dd", trtsizsp.trespace using "dddddd.dd",
trtsizsp.bedspace using "%8r",\
      trtsizsp.mapnfile using "%8r",\
for trtsizsp.keyname= ^vname, order trtsizsp.site, trtsizsp.yearpltd, trtsizsp.testname,\
      trtsizsp.treatmnt
endif
finish all
if e.oprn=true then
  eject
  e.oprn=false
endif

```

KEYNAME.IPF is a procedure which prompts the user to select the keyname upon which the report should be based. The routine first lists the valid keynames found in the projid file. The user is also asked whether the report should be sent to the printer

```

/* define a local form for output of the projid keynames */
dim labels(1,2)
local form labelfrm
      at 1,10 put labels(1,1) str using "%8r"
      at 1,24 put labels (1,2) str using "%8r"
endform
x=1      !variable to increase the output line

if not inuse("projid") then use "\\srwcpdat\projid";endif
e.supd=true !turn off display of records obtained from the projid file
clear      !clear the screen
obtain first      !get the first record

while not pastend(projid) do !get the keyname from each record and
      labels(1,1)=keyname      !display on the screen

```

```

        obtain next
        labels(1,2)=keyname
        obtain next
        tally labelfrm at x,1
        x=x+1
    endwhile
    e.supd=false
    finish projid                !close the projid file
    e.supd=false                !turn on record display
    e.stat=false                !turn off statistical output
    vname=""                    !initialize vname variable to a blank
    printon=""                  !initialize printon variable to a blank

    local form kname
        at 12,1 to 25,80 put "fwbu"
        at 14, 10 put "Valid Keynames Appear Above"
        at 16, 10 put "Input Keyname or hit ENTER for all"
        at 16, 60 put vname using "%8r"
        at 16, 60 get vname using "%8r"
        at 18, 10 put "Do you want this sent to the printer? (y/n)"
        at 18, 60 put printon using "u"
        at 18, 60 get printon using "u"
    endform
    putform kname; getform kname
    vname="\"+vname+"\\"; printon="\"+printon+"\\"
    if ^printon="y" then
        e.oprn=true
        e.pwid=240
        e.lstr=200
        print chr(15)
    endif
endif

```

5.3 MISCELLANEOUS REPORTS AND PROGRAMS SOURCE CODE

5.3.1 SPECLRPT.IPF - Report Generation Control Procedure

This procedure controls the process of data reporting in the SRWCP database and allows the user to access a program which aids in the conversion of English units (e.g., feet) to metric units (meters). The routine functions by painting a menu onto the screen and prompting the user to input the number of the report to be printed. The procedure then retrieves the appropriate subprocedure to output the desired report or start the appropriate program. Upon completion of any one reporting session, the user is asked if he/she wants to continue. An answer of "Yes" will cause the next sequential report to be printed. A "No" answer will cause the initial report selection menu to be displayed. The user can select another report or stop the session and return to the main menu (BEGINN.IPF) by entering a "0". The program calls RPTSCRN.IPF and CONTRPT.IPF.

```

/* Retrieve the report selection menu; set up an infinite while loop which will be exited via a user request through
the variable 'blchoic' when 'blchoic='0'. In addition, retrieve the continuation menu to be displayed upon
completion of each report session. */

```

```

load "\\kman\\rptscrn" with "f"; include "contrpt.ipf"
e.oprn=false; e.lstr=35
let forever=true
while forever=true do
/* Paint the report selection menu on the screen and request the user to input the desired report or program. */
putform rptscrn; getform rptscrn

```

```

if tblchoic = 0 then return; endif      /* If the choice input by the user, 'tblchoic', is zero, then return from this
                                       procedure to the main procedure (BEGINN.IPF). */

/* Test the value of 'tblchoic' input by the user. Retrieve the appropriate report printing procedure and produce the
report.*/
test tblchoic
case 1:      /* Output Projects and Sites by Species Report (old Report A) */
  perform "\\srwcp rpt\reporta"
  e.oprn=false
  putform contrpt; getform contrpt
  if contin="N" then continue; endif
case 2:      /* Output Species and Sites by Project Report (old Report B) */
  perform "\\srwcp rpt\reportb"
  e.oprn=false
  putform contrpt; getform contrpt
  if contin="N" then continue; endif
case 3:      /* Output Yields by Project, Species and Year Report (modified version of old Report C) */
  perform "\\srwcp rpt\reportc"
  e.oprn=false
  putform contrpt; getform contrpt
  if contin="N" then continue; endif
case 4:      /* Output Listing for a Particular Project (dump of all the data for one project) */
  perform "\\srwcp rpt\reports"
  e.oprn=false
  putform contrpt; getform contrpt
  if contin="N" then continue; endif
case 5:      /* Output Regional Yields of Species Report (statistical display from old Report G) */
  perform "\\srwcp rpt\regstat"
  e.oprn=false
  putform contrpt; getform contrpt
  if contin="N" then continue; endif
case 6:      /* Access the English/Metric Data Conversion Program */
  perform "\\srwcp rpt\convertp"
  e.oprn=false
  putform contrpt; getform contrpt
  if contin="N" then continue; endif
case 7:      /* Access the Yearly Rain/Temperature (Fahrenheit/Inches) Menu */
  perform "\\srwcp rpt\rain2prc"
  putform contrpt; getform contrpt
  if contin="N" then continue;endif
endtest

/* Return to the top of the while loop for another iteration. Redisplay the report-select screen and ask for the report
to be printed. */

endwhile

```

5.3.2 Form for Miscellaneous Reports and Programs Menu

FORM RPTSCRN

```

AT 2, 23 PUT "MISCELLANEOUS REPORTS AND PROGRAMS"
AT 5, 6 PUT "Projects and Sites by Species.....1"
AT 6, 6 PUT "Species and Sites by Project .....2"
AT 7, 6 PUT "Yields by Project, Species and Year .....3"
AT 8, 6 PUT "Complete Listing for a Particular Project .....4"
AT 10, 6 PUT "Treatment Yields of Species by Regions (statistics only).....5"
AT 11, 6 PUT "English/Metric Data Conversion Program .....6"
AT 12, 6 PUT "Yearly Rain/Temp. (Fahrenheit/Inches) Program.....7"
AT 24, 2 PUT "Please Select Report/Program or 0 to Stop:"
AT 24, 57 GET TBLCHOIC NUM USING "dd"
AT 1, 1 TO 25, 80 PUT "FWBU"

```

```

AT 4, 5 TO 17, 75 PUT 'FWBA'
AT 25, 1 TO 25, 1 PUT 'FWBA'
ENDFORM

```

5.3.3 Form for Continuation Prompt

```

Form CONTRPT at 24,50 to 24,80 put "br"
  at 24,40 put "Continue Reporting? Y/N:"
  at 24,64 get contin str using "u"
Endform

```

5.3.4 Projects and Sites by Species Report

REPORTA.IPF contains the procedures that generate a report listing the species that have been investigated at each project and site.

```

/* initialize environment variables */
e.legh=true      /* turn on the column headings specified in legend variable */
e.suph=false    !suppress normal column headings
e.stat=false    !turn off statistical summary
print chr(15)   !tell the printer to use compressed print
e.oprn=true     !send output to the printer
e.pmar=15       !set the left margin
e.secb=true     !suppress page ejects at 'group' breaks
e.lstr=100     !reset character string length to 100 characters

/* define column headings */
dim #legend(3)
#legend(1)="Species"; #legend(2)="Institution"
#legend(3)="Sites Planted"

/* display messages concerning program flow on the screen; put the tables in use and generate indices */
?"Tables being opened"; ?"Indices being generated"
if not inuse("trtps1") then use "\\srwcpdat\\trtps1";endif
if not inuse("speciesn") then use "\\srwcpdat\\speciesn"
  index "\\srwcpdat\\speciesn" for speciesn by speciesn.dbname;endif
if not inuse("projid") then use "\\srwcpdat\\projid"
  index "\\srwcpdat\\projid" for projid by projid.keyname;endif
?"Index generation completed"
?"Search and Retrieval Beginning"

if e.oprn=true then eject;endif
?"Species Listed by Institution and Sites"      !title of report
?#date
e.lstr=30 !reset output string length to 30 characters

Select all unique trim(speciesn.latin),\
  trim(projid.compname), trtps1.site using "%14r",\
from trtps1, from projid pluck trtps1.keyname,\
from speciesn pluck trtps1.species, group by speciesn.latin,\
order by az speciesn.latin projid.institut trtps1.site

finish all      !close data tables
e.suph=true    !turn on display of column headings
e.legh=false   !turn off display of legend labels
e.oprn=false   !turn off printer

```

5.3.5 Species and Sites by Project Report

REPORTB.IPF contains the procedures that generate a report listing the institutions funded by the SRWCP and the species and sites at each institution.

```

/* initialize environment variables */
e.legh=true      /*turn on the column headings specified in legend variable */
e.suph=false    !suppress normal column headings
e.stat=false     !turn off statistical summary
print chr(15)   !tell the printer to use compressed print
e.oprn=true     !send output to the printer
e.pmar=15       !set the left margin
e.secb=true     !suppress page ejects at 'group' breaks
e.lstr=100      !reset character string length so title prints

/* define column headings */
dim #legend(3)
#legend(1)="Institution"; #legend(2)="Species"
#legend(3)="Sites Planted"

/* display messages concerning program flow; put the tables in use and generate indices */
?"Tables being opened"; ?"Indices being generated"
if not inuse("trtps1") then use "\\srwcpdat\\trtps1";endif
if not inuse("speciesn") then use "\\srwcpdat\\speciesn"
      index "\\srwcpdat\\speciesn" for speciesn by speciesn.dbname;endif
if not inuse("projid") then use "\\srwcpdat\\projid"
      index "\\srwcpdat\\projid" for projid by projid.keyname;endif
?"Index generation completed"
?"Search and Retrieval Beginning"

if e.oprn=true then eject;endif

?"Species and Sites by Institution"          !title of report
?#date
e.lstr=30 !reset to 30 characters

Select all unique trim(projid.compname),\
      trim(speciesn.latin), trtps1.site using "%14r",\
from trtps1, from projid pluck trtps1.keyname,\
from speciesn pluck trtps1.species, group by projid.institut,\
order by az projid.institut trtps1.species trtps1.site

e.legh=false    !turn off the column headings
e.suph=true     !turn on normal column headings
e.oprn=false    !turn off printer
e.stat=false   !turn off statistics
finish all     !close data tables

```

5.3.6 Yields by Project, Species and Year Report

REPORTC.IPF contains the procedures that generate a report listing biomass yields for one project for all calendar years (REPC1.IPF), for all projects and one calendar year (REPC2.IPF), for all projects and all calendar years (REPC3.IPF), or for one project for one calendar year (REPC4.IPF). The user designates which type of report is desired by indicating the calendar year or keyname as limiting criteria.

```

/* Call program which prompts user to designate calendar year and/or keyname */
perform "\\srwcpdprpt\\yearrep";clear

```

```

/* prompt the user to align the paper in the printer if output is going to the printer */
if e.oprn=true then
    ?"Align Paper in Printer"
    ?"Press any key to continue"
    wait
endif

/* initialize environment variables */
e.pwid=240; e.lstr=50
e.deci=2          !limit number of decimals to 2 places
e.secb=true       !suppress page breaks at control (group) breaks
e.legh=true       !turn on legend headings
e.suph=true       !turn off display of normal column headings

/* display messages concerning program flow; put the tables in use and generate indices */
?"Tables being opened"; ?"Indices being generated"
if not inuse("yryldtrt") then use "\\srwcpdat\yryldtrt";endif
if not inuse("trtsizsp") then use "\\srwcpdat\trtsizsp"
    index "\\srwcpdat\trtsiz" for trtsizsp by trtsizsp.testname,\
        trtsizsp.treatmnt
endif
if not inuse("trtps1") then use "\\srwcpdat\trtps1"
    index "\\srwcpdat\ps1spec" for trtps1 by trtps1.testname,\
        trtps1.treatmnt
endif
if not inuse("speciesn") then use "\\srwcpdat\speciesn"
    index "\\srwcpdat\species" for speciesn by speciesn.dbname;endif
if not inuse("projid") then use "\\srwcpdat\projid"
    index "\\srwcpdat\projid" for projid by projid.keyname;endif
?"Index generation completed"
?"Search and Retrieval Beginning"

if e.oprn=true then eject;endif

test true          /* Perform the appropriate action based on user input */
case ^vyear="":
    perform "\\srwcpdpt\repc1"; break
case ^vyear="" and ^vname ne "":
    perform "\\srwcpdpt\repc2"; break
case ^vyear ne "" and ^vname="":
    perform "\\srwcpdpt\repc3"; break
case ^vyear ne "" and ^vname ne "":
    perform "\\srwcpdpt\repc4"; break
endtest
/* reset all environment variables */
e.suph=false       !turn on normal column heading display
e.legh=false       !turn off legend heading display
e.oprn=false       !turn off printer
e.stat=false       !turn off statistics
finish all         !close all tables

```

REPC1.IPF is a submodule called from REPORTC.IPF that generates a biomass yield report for all projects and all years.

```

/* initialize environment variables */
e.stat=false; e.legh=true
e.suph=false; e.deci=2

/* define column headings */
dim #legend(18)
#legend(1)="Institution"; #legend(2)="Site"; #legend(3)="Test"

```



```

#legend(4)="Treatment"; #legend(5)="Species"; #legend(6)="Year"
#legend(7)="Rotation"; #legend(8)="Growth Year"; #legend(9)="Root Age"
#legend(10)="Trees/ha"; #legend(11)="Area/Trt"; #legend(12)="# Repls"
#legend(13)="Trees/Rep"; #legend(14)="Total Yield"
#legend(15)="Avg. Yield"; #legend(16)="DBH"
#legend(17)="DSH"; #legend(18)="Height"

?"Biomass Yields by Project and Test";?#date
  select projid.institut using "%11r", yryldtr.site using "u%7r", yryldtr.testname using "%8r",\
    yryldtr.treatmnt using "%9r", trim(speciesn.latin), yryldtr.calenyr using "%4r",\
    yryldtr.rotation using "%8d", yryldtr.growthyr using "ddddddd.dd",\
    yryldtr.rootage using "dddddd.dd", trtsizsp.tdensity using "ddddddddd",\
    trtsizsp.trtarea using "ddddddd.dd", trtsizsp.numrepls using "dddddd",\
    trtsizsp.treerep using "ddddddddd", yryldtr.bioyield using "ddddddd.dd",\
    yryldtr.avgyld using "ddddddd.dd", yryldtr.dbh, yryldtr.dsh, yryldtr.height using "dddd.dd",\
  from yryldtr for yryldtr.bioyield <> 0 and yryldtr.calenyr=^vyear,\
  from projid pluck yryldtr.keyname, from trtsizsp pluck yryldtr.testname yryldtr.treatmnt,\
  from trtps1 pluck trtsizsp.testname trtsizsp.treatmnt,\
  from speciesn pluck trtps1.species,\
  group by projid.institut,yryldtr.site,yryldtr.testname\
  order projid.institut, yryldtr.site, yryldtr.testname,\
    yryldtr.treatmnt, yryldtr.rootage

```

REPC2.IPF is a submodule called from REPORTC.IPF that generates a biomass yield report for a specific project.

```

/* initialize environment variables */
e.deci=2; e.stat=false; e.legh=true; e.suph=false
/* define column headings */
dim #legend(17)
#legend(1)="Site"; #legend(2)="Test"; #legend(3)="Treatment"
#legend(4)="Species"; #legend(5)="Year"; #legend(6)="Rotation"
#legend(7)="Growth Year"; #legend(8)="Root Age"; #legend(9)="Trees/ha"
#legend(10)="Area/Trt"; #legend(11)="# Repls"; #legend(12)="Trees/Rep"
#legend(13)="Total Yield"; #legend(14)="Avg. Yield"; #legend(15)="DBH"
#legend(16)="DSH"; #legend(17)="Height"

?"Biomass Yields for " ^vname
  select yryldtr.site using "u%7r", yryldtr.testname using "%8r",\
    yryldtr.treatmnt using "%9r", trim(speciesn.latin), yryldtr.calenyr using "%4r",\
    yryldtr.rotation using "%8d", yryldtr.growthyr using "ddddddd.dd",\
    yryldtr.rootage using "dddddd.dd", trtsizsp.tdensity using "ddddddddd",\
    trtsizsp.trtarea using "ddddddd.dd", trtsizsp.numrepls using "dddddd",\
    trtsizsp.treerep using "ddddddddd", yryldtr.bioyield using "ddddddd.dd",\
    yryldtr.avgyld using "ddddddd.dd", yryldtr.dbh, yryldtr.dsh, yryldtr.height using "dddd.dd",\
  from yryldtr for yryldtr.bioyield <> 0 and yryldtr.keyname=^vname,\
  from projid pluck yryldtr.keyname, from trtsizsp pluck yryldtr.testname yryldtr.treatmnt,\
  from trtps1 pluck trtsizsp.testname trtsizsp.treatmnt, from speciesn pluck trtps1.species,\
  group by yryldtr.site, yryldtr.testname, order yryldtr.site, yryldtr.testname,\
    yryldtr.treatmnt, yryldtr.rootage

```

REPC3.IPF generates a report that lists the biomass yields for all projects for a specific year.

```

/* initialize environment variables */
e.legh=true;e.suph=false
e.stat=true      !turn on statistics
e.secb=true      !suppress page ejects at 'control' breaks
/* define column headings */

```

```

dim #legend(18)
#legend(1)="Institution"; #legend(2)="Site"; #legend(3)="Test"
#legend(4)="Treatment"; #legend(5)="Species"; #legend(6)="Year"
#legend(7)="Rotation"; #legend(8)="Growth Year"; #legend(9)="Root Age"
#legend(10)="Trees/ha"; #legend(11)="Area/trt"; #legend(12)="# Repls"
#legend(13)="Trees/Rep"; #legend(14)="Total Yield"
#legend(15)="Avg. Yield"; #legend(16)="DBH"
#legend(17)="DSH"; #legend(18)="Height"

?"Biomass Yields by Project for " ^vyear; ?#date
select projid.institut using "%11r", yryldtrt.site using "u%7r", yryldtrt.testname using "%8r",\
  yryldtrt.treatmnt using "%9r", trim(speciesn.latin), yryldtrt.calenyr using "%4r",\
  yryldtrt.rotation using "%8d", yryldtrt.growthyr using "dddddddd.dd", yryldtrt.rootage using "dddddd.dd",\
  trtsizsp.tdensity using "dddddddd", trtsizsp.trtarea using "dddddd.dd",\
  trtsizsp.numrepls using "dddddd", trtsizsp.ttreerep using "dddddddddd",\
  yryldtrt.bioyield using "dddddddd.dd", yryldtrt.avgyld using "dddddddd.dd",\
  yryldtrt.dbh, yryldtrt.dsh, yryldtrt.height using "dddd.dd",\
  from yryldtrt for yryldtrt.bioyield <> 0 and yryldtrt.calenyr= ^vyear,\
  from projid pluck yryldtrt.keyname, from trtsizsp pluck yryldtrt.testname yryldtrt.treatmnt,\
  from trtps1 pluck trtsizsp.testname trtsizsp.treatmnt,\
  from speciesn pluck trtps1.species,\
  group by yryldtrt.testname,\
  order projid.institut, yryldtrt.site, yryldtrt.testname,\
  yryldtrt.treatmnt
/* reset environment variables */
e.suph=true; e.legh=false
e.stat=false      !turn off statistics

```

REPC4.IPF generates a report that lists the biomass yields for one project for one calendar year.

```

/* initialize environment variables */
e.stat=true; e.deci=2
e.secb=true      !suppress page breaks at control (group) breaks
e.legh=true; e.suph=false
/* define column headings */
dim #legend(17)
#legend(1)="Site"; #legend(2)="Test"; #legend(3)="Treatment"
#legend(4)="Species"; #legend(5)="Year"; #legend(6)="Rotation"
#legend(7)="Growth Year"; #legend(8)="Root Age"; #legend(9)="Trees/ha"
#legend(10)="Area/trt"; #legend(11)="# Repls"; #legend(12)="Trees/Rep"
#legend(13)="Total Yield"; #legend(14)="Avg. Yield"; #legend(15)="DBH"
#legend(16)="DSH"; #legend(17)="Height"

?"Biomass Yields for " ^vname " and " ^vyear
select yryldtrt.site using "u%7r", yryldtrt.testname using "%8r",\
  yryldtrt.treatmnt using "%9r", trim(speciesn.latin), yryldtrt.calenyr using "%4r",\
  yryldtrt.rotation using "%8d", yryldtrt.growthyr using "dddddddd.dd",\
  yryldtrt.rootage using "dddddd.dd", trtsizsp.tdensity using "dddddddd",\
  trtsizsp.trtarea using "dddddddd.dd", trtsizsp.numrepls using "dddddd",\
  trtsizsp.ttreerep using "dddddd", yryldtrt.bioyield using "dddddddd.dd",\
  yryldtrt.avgyld using "dddddddd.dd", yryldtrt.dbh, yryldtrt.dsh, yryldtrt.height using "dddd.dd",\
  from yryldtrt for yryldtrt.bioyield <> 0 and yryldtrt.calenyr= ^vyear and yryldtrt.keyname= ^vname,\
  from trtsizsp pluck yryldtrt.testname yryldtrt.treatmnt,\
  from trtps1 pluck trtsizsp.testname trtsizsp.treatmnt,\
  from speciesn pluck trtps1.species,\
  group by yryldtrt.testname,\
  order yryldtrt.site, yryldtrt.testname,\
  yryldtrt.treatmnt
/* reset environment variables */
e.legh=false; e.stat=false      !turn off statistics

```

5.3.7 Complete Listing for a Particular Project

The source code for the procedure that generates a complete listing of all the data for a particular project is not presented here because the procedure simply consists of a series of KnowledgeMan "select" commands for each of the 32 data tables.

5.3.8 Regional Yields of Species (Statistics Only) Report

REPGSTAT.IPF generates a report that lists only the statistics for the treatment yields of species by region and state.

```

/* initialize environment variables */
e.legh=true; e.suph=false; e.stat=true
e.secb=true; e.spgn=false; printon=""

local form printyes
    at 12, 1 to 25, 80 put "fwbu"
    at 14, 10 put "Do you want this sent to the printer? (y/n)"
    at 14, 65 put printon using "u"
    at 14, 65 get printon using "u"
endform
clear
putform printyes; getform printyes

if printon="y" then
    print chr(15)
    e.pwid=240
    e.pmar=0
    e.oprn=true
endif

/* define column headings */
dim #legend(10)
#legend(1)="Region"; #legend(2)="State"; #legend(3)="Species"
#legend(4)="Site"; #legend(5)="Test Name"; #legend(6)="Treatment"
#legend(7)="Rotation"; #legend(8)="Age"; #legend(9)="Yield"
#legend(10)="Avg. Yield"

/* display messages about program flow and open tables for use */
?"Tables Being Opened"
?"Indexes Being Generated"
if not inuse("yryldtrt") then use "\\srwcpdat\\yryldtrt";endif
if not inuse("siteloc") then use "\\srwcpdat\\siteloc\"
    index "\\srwcpdat\\siteloc" for siteloc by siteloc.site
endif
if not inuse("trtps1") then use "\\srwcpdat\\trtps1\"
    index "\\srwcpdat\\trtps1" for trtps1 by trtps1.testname,\
    trtps1.treatmnt
endif
if not inuse("speciesn") then use "\\srwcpdat\\speciesn\"
    index "\\srwcpdat\\speciesn" for speciesn by speciesn.dbname;endif
?"Index Generation Complete"
?"Search and Retrieval Beginning"

if e.oprn=true then
    ?"Make Sure Printer Is On"
    ?"Align Paper at Top of Page Using Printer FormFeed Control"
    ?"Press Any Key to Continue"
    wait

```

```

      eject
    endif
  /* Output report title and region codes */
  ?"Treatment Yields of Species by Region"
  ?#date;?
  ?"Region Codes"
  ?"    GP = Great Plains"
  ?"    LS = Lake States"
  ?"    MW = Midwest"
  ?"    NE = Northeast"
  ?"    PNW = Pacific Northwest"
  ?"    S/SE = South/Southeast"
  ?"    SB = Subtropics"
  ?"    W/SW = West/Southwest"
  ?
  e.lstr=30

  Stat siteloc.region using "%8r", siteloc.state using "%8r", trim(speciesn.latin),\
    yryldtr.site using "%10r", yryldtr.testname using "%10r",\
    yryldtr.rotation using "dddddd.dd", yryldtr.growthyr using "dd.dd", yryldtr.bioyield using "dddddd.dd",\
    yryldtr.avgyld using "dddddd.dd",\
  from yryldtr for yryldtr.bioyield <> 0, from trtps1 pluck yryldtr.testname yryldtr.treatmnt,\
  from speciesn pluck trtps1.species, from siteloc pluck yryldtr.site,\
  group by siteloc.region, order by az siteloc.region, siteloc.state\
  trtps1.species yryldtr.site, yryldtr.testname,\
  yryldtr.treatmnt, yryldtr.rootage

  /* reset environment variables and close data tables */
  finish all
  e.stat=false;e.legh=false;e.oprn=false

```

5.3.9 English/Metric Data Conversion Program

CONVERTP.IPF functions like a calculator to convert data input from Fahrenheit to Celsius, Celsius to Fahrenheit, or meters to feet using a substitution indicator. The user is prompted for the action desired.

```

clear
load from "\\srwcp\prpt\convp" with "f"

while true do
  clear; option=""
  putform tempchng; getform tempchng
  test option
    Case "1": perform "\\srwcp\prpt\fahren"; break
    case "2": perform "\\srwcp\prpt\celsius"; break
    case "3": perform "\\srwcp\prpt\meters"; break
    case "4": perform "\\srwcp\prpt\inches"; break
    case "5": perform "\\srwcp\prpt\hectare";break
    case "6": perform "\\srwcp\prpt\megagram";break
    case "7": clear; return
    otherwise: ?"Error -- press carriage return"
              ?"Then enter 1-7";wait
  endtest
endwhile

```

FAHREN.IPF is a procedure that converts Celsius temperatures to Fahrenheit temperatures.

```
clear; e.lstr = 50
e.deci = 2
/* choice variable drives the program for more than one repetition */
choice = "Y"
ftemp = 0

while choice = "Y" do
  input var with "Which Celsius temperature?: "
  ftemp = 9/5 * ^var + 32
  ? "Fahrenheit temperature is " ftemp
  var = 0
  input choice using "u" with\
    "Do you want to convert another temperature (Y/N) ?"
endwhile
clear
```

CELSIUS.IPF converts Fahrenheit temperatures to Celsius temperatures.

```
e.lstr = 50; e.deci = 2
clear
!choice variable drives the program for more than one repetition
choice = "Y"; ctemp = 0

while choice = "Y" do
  input var with "Which Fahrenheit temperature?: "
  ctemp = (5/9) * (^var - 32)
  ? "Celsius temperature is " ctemp
  var = 0
  input choice using "u" with "Do you want to convert another temperature (Y/N) ?"
endwhile
clear
```

METERS.IPF is a procedure that converts feet into meters.

```
/* initialize environment variables */
clear
e.lstr = 50; e.deci = 2
!choice variable drives the program for more than one repetition
choice = "Y"; ftemp = 0

while choice = "Y" do
  input var with "How many feet: "
  ftemp = .3048 * ^var
  ? "Feet converted to meters equal " ftemp
  var = 0
  input choice using "u" with "Do you want to convert another number (Y/N) ?"
endwhile
clear
```

HECTARE.IPF is a program that converts acres to hectares.

```
clear; e.lstr = 50; e.deci = 2
!choice variable drives the program for more than one repetition
choice = "Y"; ftemp = 0

while choice = "Y" do
  input var with "How many acres: "
```

```

    ftemp = .405 * ^var
    ? "Acres converted to hectares equal " ftemp
    var = 0
    input choice using "u" with "Do you want to convert another number (Y/N) ?"
endwhile
clear

```

MEGAGRAM.IPF is a program that converts tons per acre to Mg per hectare.

```

clear; e.lstr = 50
e.deci = 2; clear
!choice variable drives the program for more than one repetition
choice = "Y"
ftemp = 0

while choice = "Y" do
    input var with "How many tons/acres "
    ftemp = 2.24 * ^var
    ? "Tons/acre converted to Mg/ha equal " ftemp
    var = 0
    input choice using "u" with "Do you want to convert another
        number (Y/N) ?"
endwhile
clear

```

5.3.10 Yearly Rain/Temperature (Fahrenheit/Inches) Program

RAIN2PRC.IPF is a program that was created in response to a need to input data in English units directly into the RAINTEMP file. The data fields accept the English units and convert them to their metric equivalents. The user has the option of browsing or creating data in RAINTEM2.ITB file and then transferring that data to the RAINTEMP.ITB file that is part of the main database system.

```

load from "\\srwcpipf\rain" with "f"; load "\\srwcpipf\raintem2" with "f"
if not inuse("raintem2") then use "\\srwcpdat\raintem2"; endif
load from "\\srwcpipf\raintem2" with "f"
while true do
    putform rain; getform rain
    clear
    test funct
        case 0: ?"Program Completed"
            release funct
            release rain;release raintem2
            finish all; return
        case 1: browse raintem2 with raintem2;break
        case 2: create with raintem2;break
        case 3: at 1, 20 ?"Attach Program"
            perform "\\srwcpipf\rainconv"; break
    endtest
endwhile

```

RAINCONV.IPF first converts the records from the RAINTEM2.ITB file to RAIN.TXT (an ASCII file) and attaches them to the RAINTEMP file.

```

e.cf=0;e.step=true
if not inuse("raintem2") then use "\\srwcpdat\raintem2"; endif

```

```
if not inuse("raintemp") then use "\\srwcpdat\raintemp"; endif
run "del rain.txt"
```

```
convert subnum, keyname, site, calenyr, numffday, tarnfl using "dddd.dd",\
        gsrnfl using "dddd.dd", mjantemp using "ddd.dd",\
        tjanrnfl using "ddd.dd", mfebtemp using "ddd.dd",\
        tfebrnfl using "ddd.dd", mmartemp using "ddd.dd",\
        tmarrnfl using "ddd.dd", maprtemp using "ddd.dd",\
        taprrnfl using "ddd.dd", mmaytemp using "ddd.dd",\
        tmayrnfl using "ddd.dd", mjuntemp using "ddd.dd",\
        tjunrnfl using "ddd.dd", mjultemp using "ddd.dd",\
        tjulrnfl using "ddd.dd", maugtemp using "ddd.dd",\
        taugrnfl using "ddd.dd", mseptemp using "ddd.dd",\
        tseprnfl using "ddd.dd", mocttemp using "ddd.dd",\
        toctrnfl using "ddd.dd", mnovtemp using "ddd.dd",\
        tnovrnfl using "ddd.dd", mdectemp using "ddd.dd",\
        tdecrnfl using "ddd.dd", datatype, station,\
        from raintem2 to "rain.txt" range 2,lastrec(raintem2)
```

```
attach from "rain.txt" to raintemp with \
        subnum, keyname, site, calenyr, numffday, tarnfl,\
        gsrnfl, mjantemp,\
        tjanrnfl, mfebtemp,\
        tfebrnfl, mmartemp,\
        tmarrnfl, maprtemp,\
        taprrnfl, mmaytemp,\
        tmayrnfl, mjuntemp,\
        tjunrnfl, mjultemp,\
        tjulrnfl, maugtemp,\
        taugrnfl, mseptemp,\
        tseprnfl, mocttemp,\
        toctrnfl, mnovtemp,\
        tnovrnfl, mdectemp,\
        tdecrnfl, datatype, station
```

```
mark in raintem2 range 2,lastrec(raintem2)
compress raintem2 /* delete records that have been transferred to RAINTEMP */
e.step=false
```



6. REFERENCES

- Hodges, J. W. 1986. The Short Rotation Woody Crops Program computerized technical data base system. ORNL/TM-9959. Oak Ridge National Laboratory, Oak Ridge, Tennessee.
- Micro Data Base Systems, Inc. 1986. KnowledgeMan 2 Reference Manual. Micro Data Base Systems, Inc., Lafayette, Indiana.
- Micro Data Base Systems, Inc. 1986. KnowledgeMan 2 User's Guide. Micro Data Base Systems, Inc., Lafayette, Indiana.

APPENDIX A. SRWCP DATABASE MANAGEMENT SYSTEM COMPUTER FILES

Files in the \KMAN Directory

KnowledgeMan program files

clink.h	kkey.trm	kscreen.exe
dbfitb.exe	klib.exe	ktab.trm
dmake.bat	kman.exe	kterm.trm
fandc.c	kman01.ovl	ktext.ovl
ibmbw.trm	kman02.ovl	ktok.exe
ibmcol.trm	kmhelp.hlp	imake.bat
keyman.exe	kpaint.ovl	ltcexe.exe
kgraph.exe	kpass.igu	terman.exe
kgraph.ovl	kplot.exe	terms.db
kguide.hlp	kreport.ovl	usrman.exe

Files containing procedures and screen forms designed to act as a buffer between the user and KnowledgeMan

beginn.ipf	contbr.icf	rptscrn.icf
bioform.icf	contbr.ipf	speclrpt.ipf
bioform.ipf	contcr.ipf	start2.icf
brcrproc.ipf	contcr.icf	startup.ipf
brcrscrn.ipf	contrpt.ipf	
brcrscrn.icf	rptscrn.ipf	

Files needed for use with KnowledgeMan Menu-Guided Interface Tutorial

budgrpt.tpl	empsal.itb	ss19x6.icf
deptinfo.itb	graph.icf	usa.icf
empinfo.itb	hobo.icf	
emprpt.tpl	qtrsals.itb	

Files containing sample program supplied with KnowledgeMan

checks.ipf	money.ipf	setchk.ipf
------------	-----------	------------

Files in the \SRWCPDAT Directory

comments.itb	siteq.itb	yrharvmd.itb
decoding.itb	sitetyt.itb	ymntbc.itb
lresreg.itb	soilc.itb	ymntct.itb
mlandres.itb	soilp.itb	ymntft.itb
priminv.itb	speciesn.itb	ymnthb.itb
projdsc1.itb	testdesn.itb	ymntir.itb
projdsc2.itb	testvars.itb	ymntlm.itb
projid.itb	trtps1.itb	ymntmw.itb
raintemp.itb	trtsizsp.itb	ymntpc.itb
siteac.itb	woodqual.itb	ymntrt1.itb
sitelog.itb	yldmeas.itb	yryldtr.itb
siteprep.itb	yrharvin.itb	yryldtst.itb

Files in the \SRWCPIPF Directory

Files with "tokenized" representations of screen forms for browsing and input

comments.icf	soilc.icf	ymntct.icf
priminv.icf	soilp.icf	ymntft.icf
projdsc1.icf	testdesn.icf	ymnthb.icf
projdsc2.icf	testvars.icf	ymntir.icf
projid.icf	trtps1.icf	ymntlm.icf
raintemp.icf	trtsizsp.icf	ymntmw.icf
siteac.icf	woodqual.icf	ymntpc.icf
sitelog.icf	yrharvin.icf	ymntrt1.icf
siteprep.icf	yrharvmd.icf	yryldtr.icf
siteq.icf	ymntbc.icf	yryldtst.icf
sitetyt.icf		

Files with source code for screen forms for browsing and input

comments.ipf	soilc.ipf	ymntct.ipf
priminv.ipf	soilp.ipf	ymntft.ipf
projdsc1.ipf	testdesn.ipf	ymnthb.ipf
projdsc2.ipf	testvars.ipf	ymntir.ipf
projid.ipf	trtps1.ipf	ymntlm.ipf
raintemp.ipf	trtsizsp.ipf	ymntmw.ipf
siteac.ipf	woodqual.ipf	ymntpc.ipf
sitelog.ipf	yrharvin.ipf	ymntrt1.ipf
siteprep.ipf	yrharvmd.ipf	yryldtr.ipf
siteq.ipf	ymntbc.ipf	yryldtst.ipf
sitetyt.ipf		

Files in the \SRW\CP RPT Directory

These files contain the report-generating programs and miscellaneous procedures.

anreptst.ipf	file21.ipf	hectare.ipf
celsius.ipf	file22.ipf	inches.ipf
comments.tpl	file23.ipf	keyname.ipf
convertp.ipf	file24.ipf	litergal.ipf
convp.icf	file25.ipf	megagram.ipf
decod.ipf	file26.ipf	meters.ipf
fahren.ipf	file27.ipf	pirep.ipf
file1.ipf	file28.ipf	prinv.tpl
file1.tpl	file29.ipf	rain2prc.ipf
file1&3.tpl	file3.ipf	rainconv.ipf
file10.ipf	file3.tpl	rainrep.ipf
file11.ipf	file30.ipf	raintemp.tpl
file12.ipf	file31.ipf	repc1.ipf
file13.ipf	file32.ipf	repc2.ipf
file14.ipf	file33.ipf	repc3.ipf
file15.ipf	file4.ipf	repc4.ipf
file16.ipf	file5.ipf	repgstat.ipf
file17.ipf	file6.ipf	reporta.ipf
file18.ipf	file7.ipf	reportb.ipf
file19.ipf	file8.ipf	reportc.ipf
file2.ipf	file8.tpl	reports.ipf
file20.ipf	file9.ipf	yearrep.ipf
		yrbioequ.ipf

APPENDIX B. DATABASE KEY

The Database Key performs several functions. The primary function is to inform SRWCP subcontractors of the type and level of detail of information being requested for the SRWCP database and to define those data elements (or fields) in very precise terms. An additional function is to inform SRWCP database users of the file structure of the SRWCP Database Management System. The key is not intended to serve as a format for recording or reporting data.

The Key defines each of the SRWCP data files. Each file contains a relatively small number of logically grouped fields. This arrangement also facilitates data entry (i.e., forms for data entry are confined to a single screen) and provides maximum flexibility for adding or deleting fields. Each file is designated by a name, an eight-character file code, and a file number listed at the top of a page. This information is also summarized in Table A.

The fields within a file are identified by an eight-character field name, their corresponding field label, and a "picture" specifying the number of spaces and variable type, either numeric or character strings (any alphanumeric character). This picture is transparent to the user and serves as a method of checking the data integrity upon input. A lowercase "r" represents any alphanumeric character; a number preceding the "r" indicates the number of characters in the field. A lowercase "d" indicates a numeric digit. A decimal point in the field indicates where the decimal point resides for that particular data item. The pictures can be changed as the need arises if they are the wrong size or inappropriate. Additional information describing the field is given either in parentheses following the field label or in an expanded definition following the listing of all fields. Although some field names occur in several files (to allow matching between files) expanded definitions are given only the first time the field name is encountered. An index to the field names is provided at the end of the Key.

Table A. SRWCP database files

File Name	File Code	File number
Project Identification	PROJID	1
Primary Investigator	PRIMINV	2
Yield Estimates	PROJDSC1	3
Project Type of Research	PROJDSC2	4
Site Location	SITELOC	5
Site Average Climate	SITEAC	6
Site Quality	SITEQ	7
Soil Chemistry	SOILC	8
Soil Physics	SOILP	9
Site Type	SITETYP	10
Yearly Rain and Temperature	RAINTEMP	11
Test Design	TESTDESN	12
Test Variables	TESTVARS	13
Treatment Size/Spacing	TRTSIZSP	14
Site Preparation	SITEPREP	15
Treatment Planting Stock Source	TRTPS1	16
Yearly Maintenance by Treatment	YRMNTRT1	18
Yearly Maintenance - Herbicide	YRMNTHB	19
Yearly Maintenance - Fertilizer	YRMNTFT	20
Yearly Maintenance - Pest Cont.	YRMNTPC	21
Yearly Maintenance - Cultivation	YRMNTCT	22
Yearly Maintenance - Mowing	YRMNTMW	23
Yearly Maintenance - Browsing Con.	YRMNTBC	24
Yearly Maintenance - Irrigation	YRMNTIR	25
Yearly Maintenance - Liming	YRMNTLM	26
Wood Quality Characteristics	WOODQUAL	27
Yearly Harvest Information	YRHARVIN	28
Yearly Harvest Methods	YRHARVMD	29
Yearly Biomass Per Test	YRYLDTST	30
Yearly Biomass Per Treatment	YRYLDTRT	31
Yearly Biomass Equations	YRBIOEQU	32
Comments	COMMENTS	33
Species Names	SPECIESN	*
Land Resource Regions	LRESREG	*
Major Land Resource Areas	MLANDRES	*
Spacing Codes	DECODING	*

*These files are auxiliary files that do not contain original data. They are used to "decode" some of the field codes during report generation.

FILE NAME: PROJECT IDENTIFICATION
 FILE CODE: PROJID
 FILE NUMBER: 1

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract, Grant or IAG number	8r
KEYNAME	Key Name	8r
INSTITUT	Institution Code	8r
COMPNAME	Full Name of Institution	30r
DOESDAT	DOE Grant Start Date	dd-dd-dddd
DOEEDAT	DOE Grant End Date	dd-dd-dddd
ORNLSDAT	ORNL Subcontract Start Date	dd-dd-dddd
ORNLEDAT	ORNL Subcontract End Date	dd-dd-dddd
PROJDRTN	Current Project Duration	8r
COSTODOE	Current Accumulative Cost to DOE	\$ddddddd.dd
COSTORNL	Current Accumulative Cost to ORNL	\$ddddddd.dd
TECHCON	Current ORNL Technical Contact	8r
PURAGENT	Current ORNL Purchasing Agent	8r
DATEMOD	Date Record Modified	dddd
PROJTITL	Full Title of Projects	200r

<u>Data item</u>	<u>Definition</u>
SUBNUM	Last eight characters of ORNL subcontract/grant/IAG number.
KEYNAME	First eight characters of last name of first PI.
INSTITUT	Abbreviated name of subcontractor's institution.
COMPNAME	Full name of subcontractor's institution.
DOESDAT	Start date of projects first initiated as DOE grants.
DOEEDAT	End date of DOE grants.
ORNLSDAT	Initial start date of ORNL subcontracts or IAGs.
ORNLEDAT	Termination date of ORNL subcontracts or IAGs.
PROJDRTN	Total project duration to date (under DOE and ORNL).
COSTODOE	Cumulative cost to DOE (under DOE and ORNL).
COSTORNL	Cumulative cost to ORNL only.
TECHCON	Last name of SRWCP technical contact.
PURAGENT	Last name of ORNL purchasing agent.
DATEMOD	Date record modified, taking the form 0288. This variable has been added to all files.
PROJTITL	Full project title name as indicated on latest proposal.

FILE NAME: PRINCIPAL INVESTIGATOR
 FILE CODE: PRIMINV
 FILE NUMBER: 2

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
PINAME	Principal Investigator Name	40r
PIADDR1	Address Line 1	60r
PIADDR2	Address Line 2	60r
PIADDR3	Address Line 3	60r
PIADDR4	Address Line 4	60r
PIPHONE	Phone Number	ddd-ddd-dddd
DATEMOD	Date Record Modified	dddd

This file is updated annually by SRWCP program managers. All project primary investigators are included, each on a separate record.

FILE NAME: YIELD ESTIMATES
 FILE CODE: PROJDS1
 FILE NUMBER: 3

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
BESTEST	Best Estimate of Current Average Biomass Production Potential for Region Familiar to Investigator	12r
ESTDATE	Date Best Estimate Made	10r
COMMENT	Comments on Assumptions Associated with Above Best Estimate	200r

Information in this file contains a best estimate of obtainable yields in the region or area familiar to the primary investigators on a project. It is the file most often accessed when looking for quick answers for DOE. A new record will be created any time a primary investigator provides a new best estimate.

<u>Data item</u>	<u>Definition</u>
BESTEST	This value (dry Mg ha ⁻¹ yr ⁻¹) is requested to make use of the investigator's experience and knowledge, which may go beyond the test results tabulated in the database. This value should take into account the investigator's perception of the land base available, currently available seedlings or clones, and application of the best available silvicultural technology. The value can be entered as an average or as a range.
ESTDATE	Since a best estimate may change with new information, the date the estimate was made is entered (e.g., Jan 1986).
COMMENT	This field allows the investigator to briefly state assumptions and limitations in a short paragraph.

FILE NAME: PROJECT TYPE OF RESEARCH
 FILE CODE: PROJDS2
 FILE NUMBER: 4

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
Respond with yes or no to following:		
GRTHRATE	Growth Rate Info (ht, DBH, etc.)	3r
TOTBYLD	Total Biomass Yield Estimates (Mg/ha) (whole tree above stump)	3r
TOTEYLD	Total Energy Yield Estimates (kcal/g) (whole tree above stump)	3r
PARTBYLD	Bole, Branch and Foliage Biomass Yield Est.	3r
PARTEYLD	Bole, Branch and Foliage Energy Yield Est.	3r
WOODCHAR	Wood Characteristics (e.g., bulk density, specific gravity, %ash)	3r
NUTRBUDG	Nutrient Budget Information (e.g., soil nutrients, foliar nutrients, soil nutrient status change)	3r
PHYSCHAR	Structural or Physiological Characteristics (e.g., LAI, photosynthesis rate)	3r
GENGAIN	Genetic Gain	3r
COPPSUCC	Coppice Success (e.g., #coppice sprouts/stump, %coppicing)	3r
DISEAINC	Disease Incidence	3r
PESTINC	Pest Incidence	3r
BROWFREQ	Browsing Frequency	3r
ECONDATA	Economic Data	3r

The objective of this file is to identify the research areas which each project is addressing or has addressed. This information is updated annually to reflect changes in the project.

FILE NAME: SITE LOCATION
 FILE CODE: SITELOC
 FILE NUMBER: 5

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
STATE	State	8r
SFIPSNO	State FIPS Number	dd
REGION	Region Code	8r
COUNTY	County	20r
CFIPSNO	County FIPS Number	ddd
LATITUDE	Latitude (degrees, hours)	ddd.dd
LONGITUD	Longitude (degrees, hours)	ddd.dd
AREAPLTD	Area Planted at Site (ha)	ddd.dd

Information in all site files will be entered once for each site where SRWCP funded studies are established.

<u>Data item</u>	<u>Definition</u>
SITE	A site name commonly used in project annual reports abbreviated to eight characters. If a given site is composed of two or more distinct soil types, wetness levels, etc., and experimental results can be correlated to the subsite differences then label as two distinct sites (e.g., Harshaw1 and Harshaw2). If a site has not been specifically "named" in project reports, the county name is used.
SFIPSNO	A state code number used in the ORNL Geocology database.
REGION	PNW (Pacific Northwest) W/SW (West/Southwest) GP (Great Plains) LS (Lake States) MW (Midwest) S/SE (South/Southeast) NE (Northeast) SB (Subtropics) OTHER (define in comment).
CFIPSNO	A county code number used in the ORNL Geocology database.
AREAPLTD	Estimate of total area planted in SRIC research or operational plots at the named site or subsite.

FILE NAME: SITE AVERAGE CLIMATE
 FILE CODE: SITEAC
 FILE NUMBER: 6

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
AVGFFDAY*	Average Number Frost-Free Days per Year	8r
AVGANNRF*	Average Annual Rainfall (cm)	dddd.dd
AARFSTDV*	Standard Deviation of Above (cm)	dddd.dd
AVGGSRF *	Average Growing Season Rainfall (cm)	dddd.dd
AGSRSTD*	Standard Deviation of Above (cm)	dddd.dd
AVGANNSI	Average Annual Solar Insolation (MJ/m2)	dddd.dd
AVGANNPE	Average Annual Pan Evaporation (cm)	dddd.dd
EVPTRPDX	Evapotranspiration Index (Thorntwaite)	dddd.dd
RAINREGM*	Normal Rainfall Regime	8r
NDRYMO *	Normal Number Months with Rainfall <3cm	dd
DRYMORF *	Avg. Amount Rainfall in Driest Month (cm)	ddd.dd
TMAXMO *	Avg. Daily Max. Temp.(°C) in Warmest Month	ddd.dd
TMINMO *	Avg. Daily Min. Temp.(°C) of Coldest Month	ddd.dd
ANNTEMP *	Avg Annual Temp.(°C) Based on Monthly Avg.	ddd.dd
ANNHUMI	Annual Humidity Index	ddd.dd
RELHUM12	Relative Humidity Percent at noon	dd

All variables marked with an asterisk (*) can be obtained or calculated using local climatological data summaries published by the National Climatic Data Center of the National Oceanic and Atmospheric Administration (NOAA) in Asheville, N.C. If non-NOAA weather stations can provide better data, they should be used. If long-term records are not available for the general area, file should remain blank.

<u>Data Item</u>	<u>Definition</u>
SITE	Same site names used in the site location file.
AVGFFDAY	Using climatic data summarized by month, sum the number of days when minimum temperatures are below 32°F and subtract that number from total days in the year.
AVGANNRF	The preferred average annual rainfall value is the 30-year record mean precipitation for the most recent 30-year period.
AARFSTDV	The preferred annual rainfall standard deviation can be calculated based on annual precipitation by year for the most recent 30-year period of record.
AVGGSRF	Using data summarized by month, first determine growing season by using only months where average daily minimum temperature is above 40°F (4.4°C). Then calculate average growing season rainfall using monthly 30-year record means.
AGSRSTD	The preferred growing season rainfall standard deviation value can be derived by calculating growing season rainfall for each year in the most recent 30-year period of record, then calculating the year-to-year standard deviation as done for annual rainfall.

AVGANNSI	No standard source of information has been located for this field. Most major universities have stations for collecting solar radiation information. Database units are megajoules per square meter (MJ m^{-2}). Data may be available in J m^{-2} , W m^{-2} , $\text{mol s}^{-1} \text{m}^{-2}$ of photon units, or klux. Approximate conversions between Watts and other units have been developed by Li-Cor.
AVGANNPE	No standard source of information has been located, any available source is acceptable.
EVPTRPDX	No standard source of information has been located.
RAINREGM	Select one of the following conditions: Winter: one rainfall maximum in D,J,F Spring: one rainfall maximum in M,A,M Summer: one rainfall maximum in J,J,A Fall: one rainfall maximum in S,O,N Bimodal: two rainfall maxima with two distinct dry seasons each at least two months long Uniform: all year wet with no clear maximum, or all year dry
NDRYMO	Data can be reported as a single value or a range based on any long-term weather information.
DRYMORF	Rainfall in normal driest month.
TMAXMO	If using NOAA monthly climate summaries, select value for average daily maximum temperature in normal warmest month from the Normals, Means, and Extremes table.
TMINMO	If using NOAA monthly climate summaries, select value for average daily minimum temperature in normal coolest month from the Normals, Means, and Extremes table.
ANNHUMI	Annual Humidity Index (avg. ann. rainfall/avg. ann. evaporation).
RELHUM12	Percent relative humidity at noon or the nearest measurement. Midmorning and midafternoon readings should be averaged to estimate noon reading.

FILE NAME: SITE QUALITY
 FILE CODE: SITEQ
 FILE NUMBER: 7

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
PASTUSE	Past Use	8r
SITENDEX	Site Index (by timber species and age)	ddd/rrrr/ddd
LANDCLAS	Land Capability Classes (SCS ratings)	10r
SOILCLAS	Soil Classification Name	60r
SOILSERS	Soil Series Name	60r
AGRIYIEL	Normal Annual Yield of Agricultural Crop (Mg/ha/year)	10r
SRICYIEL	Expected Mean Annual Yield of SRIC crop at particular site (Mg/ha/year)	10r
DEGRADTN	Severity of Soil Degradation	8r
TYPEDGRN	Type of Degradation	15r

A record is created for each site named in previous files.

<u>Data Item</u>	<u>Definition</u>
SITE	Same as used in previous tables
PASTUSE	Select one of following options or any other eight-character descriptive term defined in a comment. cornercrop - corn and sorghum rowcrop - row crops other than corn fld_crop - close grown field crops, e.g., wheat fallow - summer fallow forestc - commercial forest forestnc - noncommercial forest haypast - rotation hay and pasture hayland - permanent forage production pastland - pasture managed for forage orchard - orchards, vineyards, bush berries rangland - rangeland with natural forage tempidle - temporarily idle with recent use openland - open land without recent use recstrip - reclaimed strip mine
SITEINDEX	Index consists of: height (in meters)/ species name abbreviation /age in years. The site index of species should be similar to those that might be used in SRIC plantations. Refer to Doolittle (1958) and Baker and Broadfoot (1977) for further information on site index.
LANDCLAS	Land capability class as determined by the Soil Conservation Service. See Klingebiel, A. A., and P. H. Montgomery (1966) for definition of classes.
SOILCLASS	Soil classification name according to the U.S. Soil Taxonomy system, e.g., Aquic Udifluent.
SOILSERS	Soil Series Name according to the U.S. Soil Taxonomy system, e.g., Adler series.

AGRIYIEL	Normal annual yield in dry Mg ha ⁻¹ year ⁻¹ of agricultural crops based either on research data or on published estimates. A range can be given.
SRICYIEL	Estimate of site production potential of woody crops using best available short rotation intensive culture practices and planting material. This differs from best estimate requested in file 3 since SRICYIEL pertains only to the named site. This data item will be used as one way of categorizing site quality for SRIC crops. A range can be given.
DEGRADIN	Severity of site degradation expressed as absent, present, severe, or no data.
TYPEDGRN	Select one of the following terms: Water erosion: including sheet and/or gully erosion Wind erosion Salinization Chemical: including acidification, lowering of bases or nutrients, toxicities(except salts) Physical: loss of pore space, compaction, decline in permeability and water storage capacity Fertility decline: lowering of capacity of soil to produce crops, through combination of chemical, physical or biological degradation. No data

FILE NAME: SOIL CHEMISTRY
 FILE CODE: SOILC
 FILE NUMBER: 8

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
DATEMOD	Date Record Modified	dddd
DEPTH	Depth (cm)	dddd-dddd
HORIZON	Horizon	5r
WPH	Water pH (standard units)	dd.d-dd.d
SPH	Soil pH (standard units)	dd.d-dd.d
CATIONEP	Cation Exchange Capacity (meq/100gm)	dddd.dd-ddddd.dd
TCALC	Total Calcium (ppm)	dddd.dd-ddddd.dd
EXCAL	Exchangeable Calcium (meq/100gm)	dddd.dd-ddddd.dd
TPOT	Total Potassium (ppm)	dddd.dd-ddddd.dd
EXPOT	Exchangeable Potassium (meq/100gm)	dddd.dd-ddddd.dd
TMAG	Total Magnesium (ppm)	dddd.dd-ddddd.dd
EXMAG	Exchangeable Magnesium (meq/100gm)	dddd.dd-ddddd.dd
INIT	Total Nitrogen (ppm)	dddd.dd-ddddd.dd
MINNIT	Minimum Nitrogen (ppm)	dddd.dd-ddddd.dd
TPHOSP	Total Phosphorous (ppm)	dddd.dd-ddddd.dd
APHOSP	Extractable Phosphorous (ppm)	dddd.dd-ddddd.dd
PHEXTMTH	Phosphorous Extraction Method	40r
TCARBON	Total Carbon (%)	%ddd.dd

A different record is created for each depth range and/or soil horizon from which information has been collected for a site. Forms are designed to enter a range of values, but an average value is also acceptable and is placed in the first blank. Different fields are available for data on either total or exchangeable ions. The phosphorous extraction method should be described in 40 spaces or less.

FILE NAME: SOIL PHYSICS
 FILE CODE: SOILP
 FILE NUMBER: 9

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
DEPTH	Depth (cm)	dddd-dddd
BULKDENS	Moist Bulk density (gms/cc)	ddd.dd-ddd.dd
STONINES	Stoniness (% > 2mm)	%ddd.dd-ddd.dd
SWSTGCAP	Soil Water Storage Capacity (cm H ₂ O/cm soil)	dddd.dd-dddd.dd
PCTSAND	%Sand	%dd-dd
PCTSILT	%Silt	%dd-dd
PCTCLAY	%Clay	%dd-dd
SOILORGM	Soil Organic Matter (%)	%dd.dd-dd.dd
DPTOWTBL	Depth to Watertable (cm)	dddddd.dd-ddddd.dd
DPTOCARB	Depth to Carbonates (cm)	dddddd.dd-ddddd.dd
LIMITHRZ	Depth to Limiting Horizon (cm)	dddddd.dd-ddddd.dd
DRAINAGE	Drainage Description	30r
TEXTURE	Textural Name of Soil	15r
POROSITY	Soil Pore Volume (%)	%dd.d

Information is entered once for each site named in previous files. Forms are designed to enter a range of values, but an average value is also acceptable and is placed in the first blank.

<u>Data Item</u>	<u>Definition</u>
BULKDENS	Ratio of dry weight of a given volume of undisturbed soil to the weight of an equal volume of water.
STONINESS	Percent of soil dry weight attributed to particles greater than 2 mm in diameter.
SWSTGCAP	Soil water storage capacity, also called field capacity, also referred to as available water.
SOILORGM	Percent of soil weight attributed to organic matter.
DPTOWTBL	Depth in centimeters to water table (during growing season).
DPTOCARB	Depth to carbonates, relevant only for some soil types.
LIMITHRZ	Depth to limiting horizon, e.g., of rock, laterite.
DRAINAGE	Drainage description such as very poor, poor, imperfectly, well, somewhat excessively, and excessively drained.

TEXTURE Select one of the textural classes shown based on mechanical analysis of soil particle size distribution. If soil is also stony, add "stony" after texture name.

Clay
Sandy clay
Silty clay
Clay loam
Sandy clay loam
Silty clay loam
Loam
Sandy loam
Silt loam
Loamy sand
Sand
Silt

POROSITY Percent pore volume, normally calculated by dividing bulk density by particle density and converting to percent.

FILE NAME: **SITE TYPE**
FILE CODE: **SITETYP**
FILE NUMBER: **10**

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
SLOPE	Slope %	%dd.dd-%dd.dd
ASPECT	Aspect (N,NE,S,SE,E,W,SW,NW)	2r
ELEVATIO	Elevation	dddd.d-ddddd.d
TOPOLOC	Topographic Location	10r
VEGECLAS	Potential Vegetation Classification	30r
FORESTYP	Forest Type	30r
LRR	Land Resource Region	1r
MLRA	Major Land Resource Area	4r
ECOREGN	Ecoregion	30r

A record is created for each site named in previous files.

<u>Data Item</u>	<u>Definition</u>
TOPOLOC	Upland, bottomland, floodplain, terrace or bench, lower slope, mid-slope, upper slope, or ridge top.
VEGECLAS	Vegetation classes as defined by Kuchler (1964).
FORESTYP	Forest type as described by the U.S. Forest Service (Lull, 1968 for NE; Merz, 1978 for Midwest; USDA/FS, 1981, for the South).
LRR	A one character code for the Land Resource Region in which the named site is located as defined by the USDA/SCS in Agriculture Handbook 296 (USDA/SCS, 1981).
MLRA	A four character code for the Major Land Resource Area in which site is located as defined by the USDA/SCS in the Agricultural Handbook 296.
ECOREGN	Ecoregion as described by Bailey, 1980.

FILE NAME: YEARLY RAINFALL AND TEMPERATURE DATA
 FILE CODE: RAINTEMP
 FILE NUMBER: 11

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
DATEMOD	Date Record Modified	dddd
CALENYR	Calendar Year	dddd
NUMFFDAY	Number of Frost-Free Days	ddd.dd
TARNFL	Total Annual Rainfall (cm)	dddd.dd
GSRNFL	Growing Season Rainfall (cm)	dddd.dd
MJANTEMP	Mean January Temp. (°C)	ddd.dd
MFEBTEMP	Mean February Temp. (°C)	ddd.dd
MMARTEMP	Mean March Temp. (°C)	ddd.dd
MAPRTEMP	Mean April Temp. (°C)	ddd.dd
MMAYTEMP	Mean May Temp. (°C)	ddd.dd
MJUNTEMP	Mean June Temp. (°C)	ddd.dd
MJULTEMP	Mean July Temp. (°C)	ddd.dd
MAUGTEMP	Mean August Temp. (°C)	ddd.dd
MSEPTEMP	Mean September Temp. (°C)	ddd.dd
MOCTTEMP	Mean October Temp. (°C)	ddd.dd
MNOVTEMP	Mean November Temp. (°C)	ddd.dd
MDECTEMP	Mean December Temp. (°C)	ddd.dd
TDECRNFL	Total December Rainfall (cm)	ddd.dd
TJANRNFL	Total January Rainfall (cm)	ddd.dd
TFEBRNFL	Total February Rainfall (cm)	ddd.dd
TMARRNFL	Total March Rainfall (cm)	ddd.dd
TAPRRNFL	Total April Rainfall (cm)	ddd.dd
TMAYRNFL	Total May Rainfall (cm)	ddd.dd
TJUNRNFL	Total June Rainfall (cm)	ddd.dd
TJULRNFL	Total July Rainfall (cm)	ddd.dd
TAUGRNFL	Total August Rainfall (cm)	ddd.dd
TSEPRNFL	Total September Rainfall (cm)	ddd.dd
TOCTRNFL	Total October Rainfall (cm)	ddd.dd
TNOVRNFL	Total November Rainfall (cm)	ddd.dd
TDECRNFL	Total December Rainfall (cm)	ddd.dd
TJANSORA	Total January Solar Radiation (Mj/m ²)	ddddddd.dd
TFEBSORA	Total February Solar Radiation (Mj/m ²)	ddddddd.dd
TMARSORA	Total March Solar Radiation (Mj/m ²)	ddddddd.dd
TAPRSORA	Total April Solar Radiation (Mj/m ²)	ddddddd.dd
TMAYSORA	Total May Solar Radiation (Mj/m ²)	ddddddd.dd
TJUNSORA	Total June Solar Radiation (Mj/m ²)	ddddddd.dd
TJULSORA	Total July Solar Radiation (Mj/m ²)	ddddddd.dd
TAUGSORA	Total August Solar Radiation (Mj/m ²)	ddddddd.dd
TSEPSORA	Total September Solar Radiation (Mj/m ²)	ddddddd.dd
TOCSORA	Total October Solar Radiation (Mj/m ²)	ddddddd.dd
TNOVSORA	Total November Solar Radiation (Mj/m ²)	ddddddd.dd
TDECSORA	Total December Solar Radiation (Mj/m ²)	ddddddd.dd
DATATYPE	Field or Station	8r
STATION	Name of Weather Station	20r

The intent of this file is to obtain information on actual climatic conditions corresponding to the years that SRWCP crops were in the ground. All requested information can be directly obtained or calculated from

NOAA/NCDC monthly summaries of local climatological data from the nearest NOAA station; however, accurate measurements in the field or local weather station information are preferable.

<u>Data Item</u>	<u>Definition</u>
CALENYR	Calendar year associated with the following data.
NUMFFDAY	Number of days between last spring and first fall frost.
GSRNFL	Total amount of rainfall during frost-free period.
M * TEMP	Mean temperatures for a given month based on averages of mean daily temperatures.
T * RNFL	Total precipitation (water equivalent) for each month.
T * SORA	Total solar radiation expressed as megajoules per square meter for each month. NOAA/NCDC radiation is reported as kiljoules per square meter.
DATATYPE	Field: based on instruments in study area. Station: data obtained from nearest weather station.
STATION	Name of weather station (e.g., NOAA identification name).

FILE NAME: TEST DESIGN
 FILE CODE: TESTDESN
 FILE NUMBER: 12

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r

Test Design Descriptors
 (answer Yes or No)

NELDER	Nelder	3r
CONTIG	Contiguous	3r
BUFFROWS	Buffer Rows	3r
CONTINVP	Continuous Inventory Plots	3r
DESTRSP	Destructive Sample Plots	3r
SUBPLOT	Subplots	3r
PLOTTYPE	Plot type a) row b) block c) single	1r
RANDOM	Randomization a) complete e) interlocking block b) block f) lattice c) latin square g) other (describe) d) incomplete block	3r

This information is entered once for each test. If a test is converted to a new use at some point, it will be renamed, and a new record will be created.

<u>Data Item</u>	<u>Definition</u>
TESTNAME	Arbitrary code name given by ORNL staff which reflects the general purpose of the test, e.g., spacing.
NELDER	Does the test include Nelder plots, i.e., circular plots with several concentric rings at different spacings?
CONTIG	Are <u>all</u> treatments within a test contiguous? (See Fig. 1)
BUFFROWS	Are buffer rows included in the test design? (See Figs. 2 and 3)
CONTINVP	Are plots established for measurement purposes only?
DESTRSP	Are plots established for yearly destructive sampling?
SUBPLOT	Are subplots used to incorporate additional test variables (e.g., rotation lengths, species)?
RANDOM	More than one option can be chosen (e.g., a,b). When "other (g)" is chosen, a description of the randomization should be included in the Comments File.

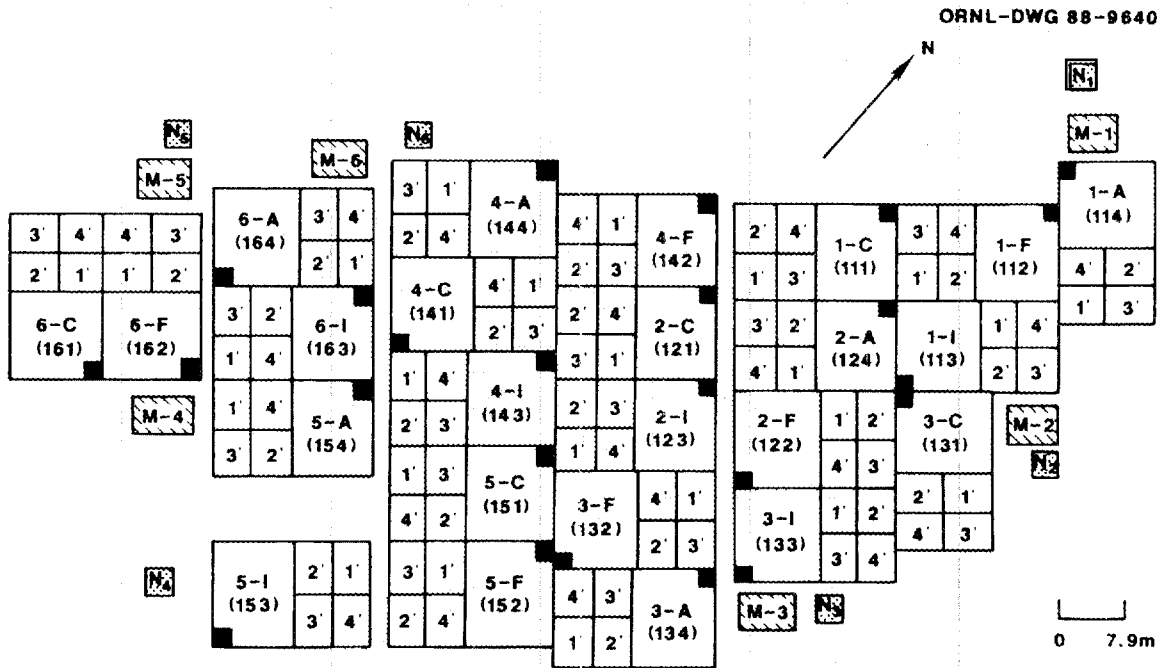
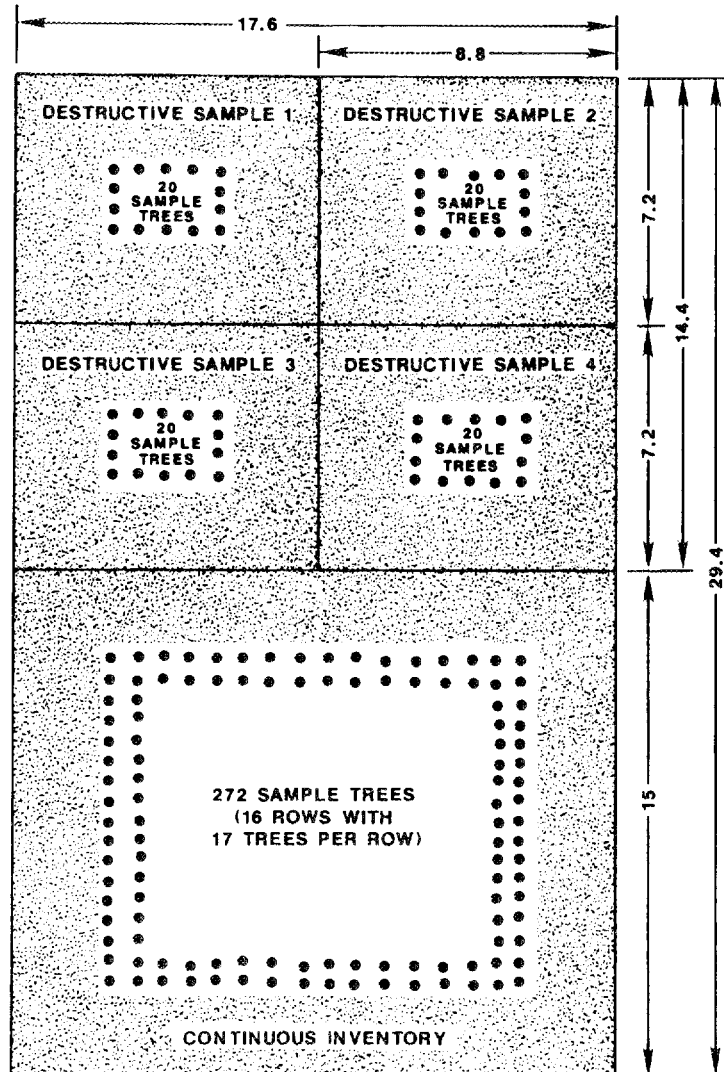


Fig. 1. Diagram of a test design in which many treatment plots are contiguous but others are not due to access lanes; the appropriate response to CONTIG is such a case is "no".

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DIMENSIONS IN METERS

Fig. 2. Plot map showing border or buffer rows on both a continuous inventory subplot and destructive sampling subplots.

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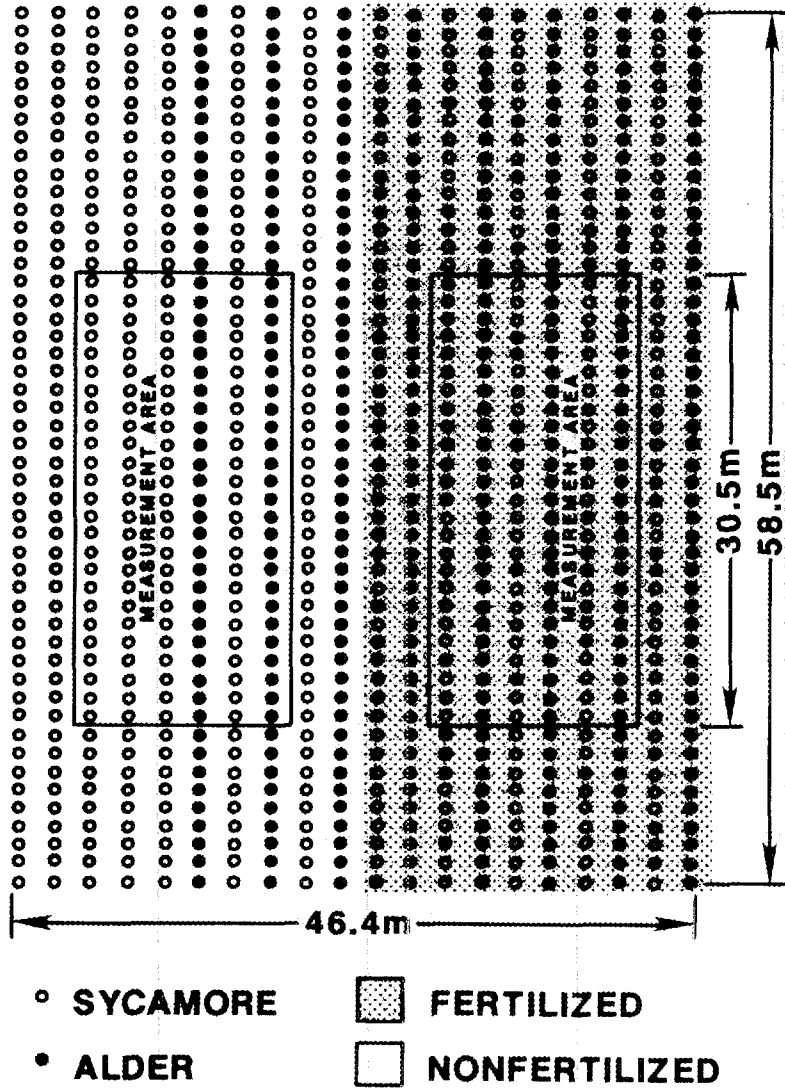


Fig. 3. Plot map showing buffers around subplots (fertilized and non-fertilized) in a split plot a sycamore/alder admixture trial.

FILE NAME: TEST VARIABLES
 FILE CODE: TESTVARS
 FILE NUMBER: 13

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r

Indicate type and number of test variables

SPECIES	Species	dd (1)
PROVNC	Provenances	dd (0)
STANDS	Stands	dd (0)
FAMILIES	Families	ddd (15)
CLONES	Clones	ddd (0)
ESTBMTHD	Establishment Methods	dd (1)
FERTILTY	Fertility Levels	dd (2)
IRRIGATN	Irrigation Levels	dd (2)
CULTVATN	Cultivation Levels or Types	dd (1)
WSTWATER	Wastewater Levels	dd (1)
HERBICID	Herbicide Types	dd (1)
SPACING	Spacing (planting densities)	dd (1)
ROTATION	Rotation Lengths	dd (1)
HARVMTHD	Harvest Methods	dd (1)
HARVDATE	Harvest Dates	dd (1)
N2FXPATN	Interplant of N2 Fixers (# patterns)	dd (1)
N2FXSPEC	Interplant of N2 Fixers (# species)	dd (1)

This information is entered once for each test. If a test is converted to a new use at some point, it will be renamed, and a new record will be created. This file contains data for all SRWCP-sponsored tests regardless of whether or not the tests are designed to provide biomass yield data. For all data items below TESTNAME, each field will have an entry; 0 is used if the variable is not relevant, and 1 is used if the variable is held constant in all treatments. The responses in parentheses are those that would correspond with the Alder portion of the Yelm plantation shown in Fig. 4. Figure 4 is also an example of a trial that could be considered either (1) a single test with quite varied treatments or (2) more than one test. We have chosen to consider it as two tests, a poplar density trial and an alder cultural trial with the satellite plots being considered as part of the two main tests.

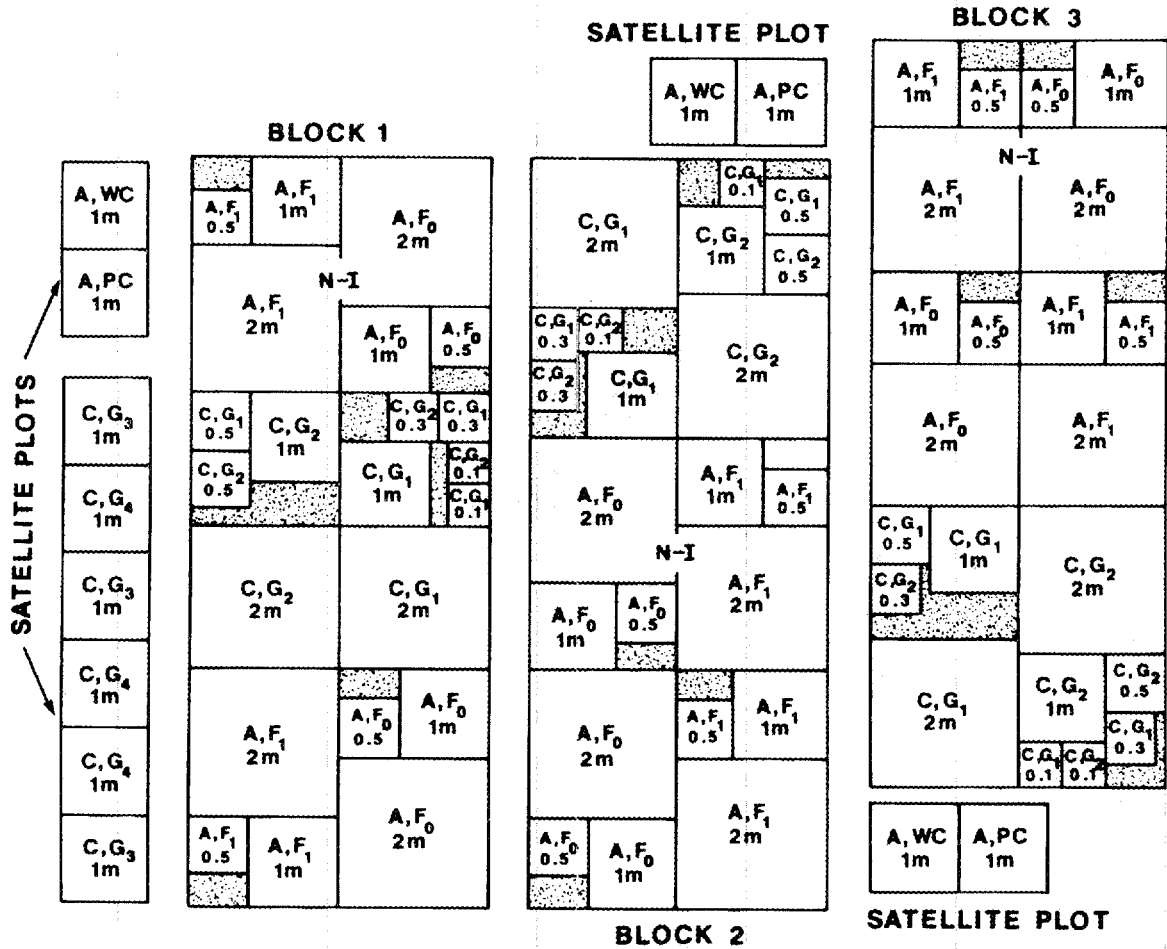


Fig. 4. Layout of Plantation I at WDNR Tree Improvement Center (Yelm).

Legend:

Species

C = poplar
A = red alder

Poplar Clones

G₁ = Dula hybrid (D-01)
G₂ = UW-WSU hybrid (#11)
G₃ = *Populus trichocarpa* (Nisqually #1)
G₄ = *P. trichocarpa* (Orting #5)

Spacings

2m = 2m x 2m
1m = 1m x 1m
0.5m = 0.5m x 0.5m
0.3m = 1 plant/ft² "wood-grass"
0.1m = 3 plants/ft² regimes

Fertilizers

F₀ = none
F₁ = 300 kg P/ha

Other

N-1 = no irrigation after second year
WC and PC = satellite plots to evaluate effects of weed or pest control

FILE NAME: TREATMENT SIZE/SPACING
 FILE CODE: TRTSIZSP
 FILE NUMBER: 14

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
YEARPLTD	Year Planted	dddd
MNTHPLTD	Month Planted (abbreviated)	3r
TESTAREA	Total Area Planted for Test (ha)	dddd.dd
BLOCKAREA	Area of each Block (set of contiguous trts)	dd.ddd
TRTAREA	Area of an Individual Treatment Plot (ha)	dd.ddd
NUMREPLS	# Replicates	dd
TTREEREP	#Total Trees/Treatment Plot/Replicate	dddd
MTREEREP	#Measurement Trees/Treatment Plot/Replicate	dddd
FAMREP	#Families Within a Treatment	dddd
TFAMREP	#Trees/Family or Within an Individual Treatment	dddd
TCLONREP	#Clones Within a Treatment	dddd
RAMTCLON	#Ramets/Clone Within a Treatment	dddd
TDENSITY	Density (#trees/ha)	dddddd
CDENSITY	Closest Density	dddddd
WDENSITY	Widest Density	dddddd
ROWSPACE	Space Between Rows (m)	dd.dd
TRESPACE	Space Between Trees (m)	dd.dd
BEDSPACE	Space Between Beds (m)	dd.dd
MAPNFILE	Map in ORNL file (yes or no)	3r
TERMDATE	Year Treatment Study Terminated	dddd
CLASS	Classification category	10r

Information is entered once for each treatment within a test and should describe the test and treatment as actually planted.

<u>Data Item</u>	<u>Definition</u>
TREATMNT	A 12-letter code assigned by ORNL usually derived from species, clone, or provenance name, ORNL spacing code and/or planting year.
TESTAREA	Total area in hectares of a test including border rows and all blocks or replicates (see Figs. 5 and 6).
BLOCKAREA	Area in hectares of a block including border rows. (synonymous with "replicate" in a replicated complete block design) (see Figs. 5 and 6).
TRTAREA	Area in hectares of each individual treatment plot including border rows.
NUMREPLS	Number of replicates of each treatment.
TTREEREP	Total number of trees in each individual treatment plot (within a replicate) including border trees.

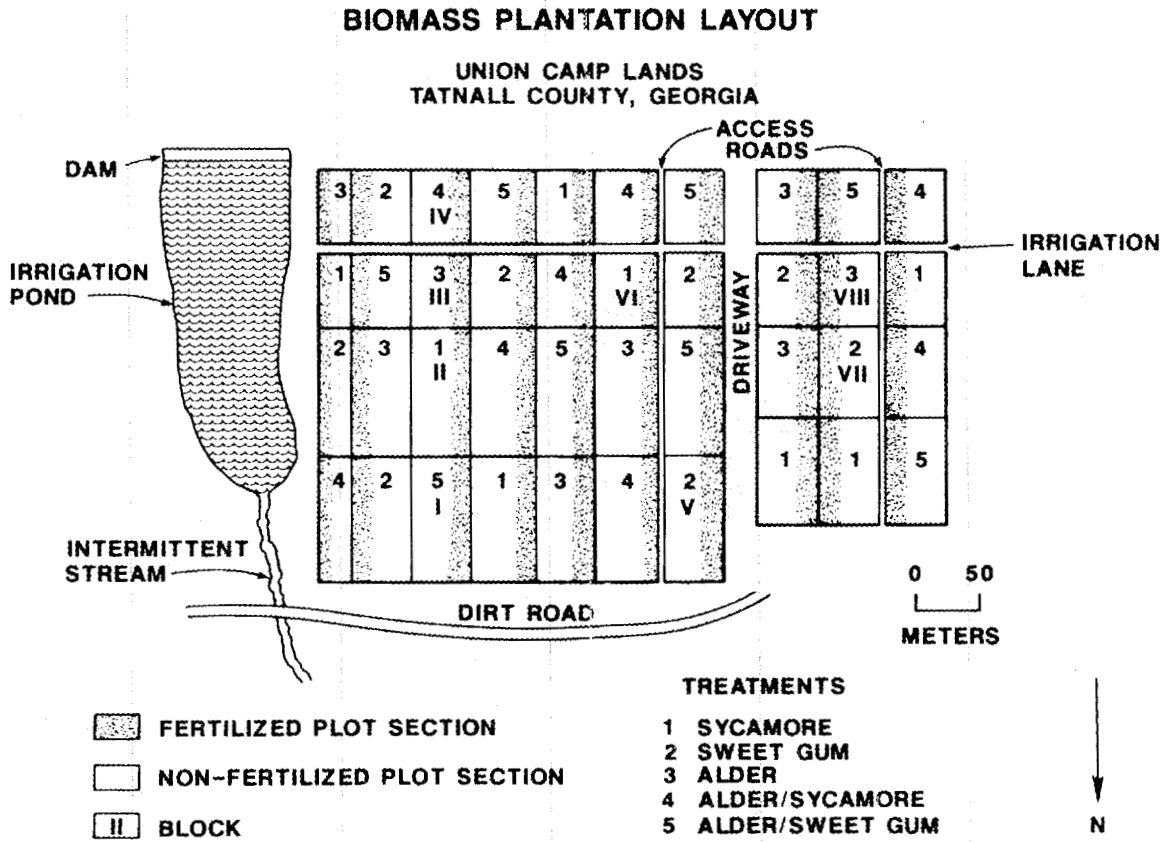


Fig. 5. Case in which TESTAREA is the approximate area of the whole plantation (roads between plots and irrigation lanes could be included). BLOCKAREA is variable in size, so answer should be given as an average. TRTAREA is also variable and should be given as an average value.

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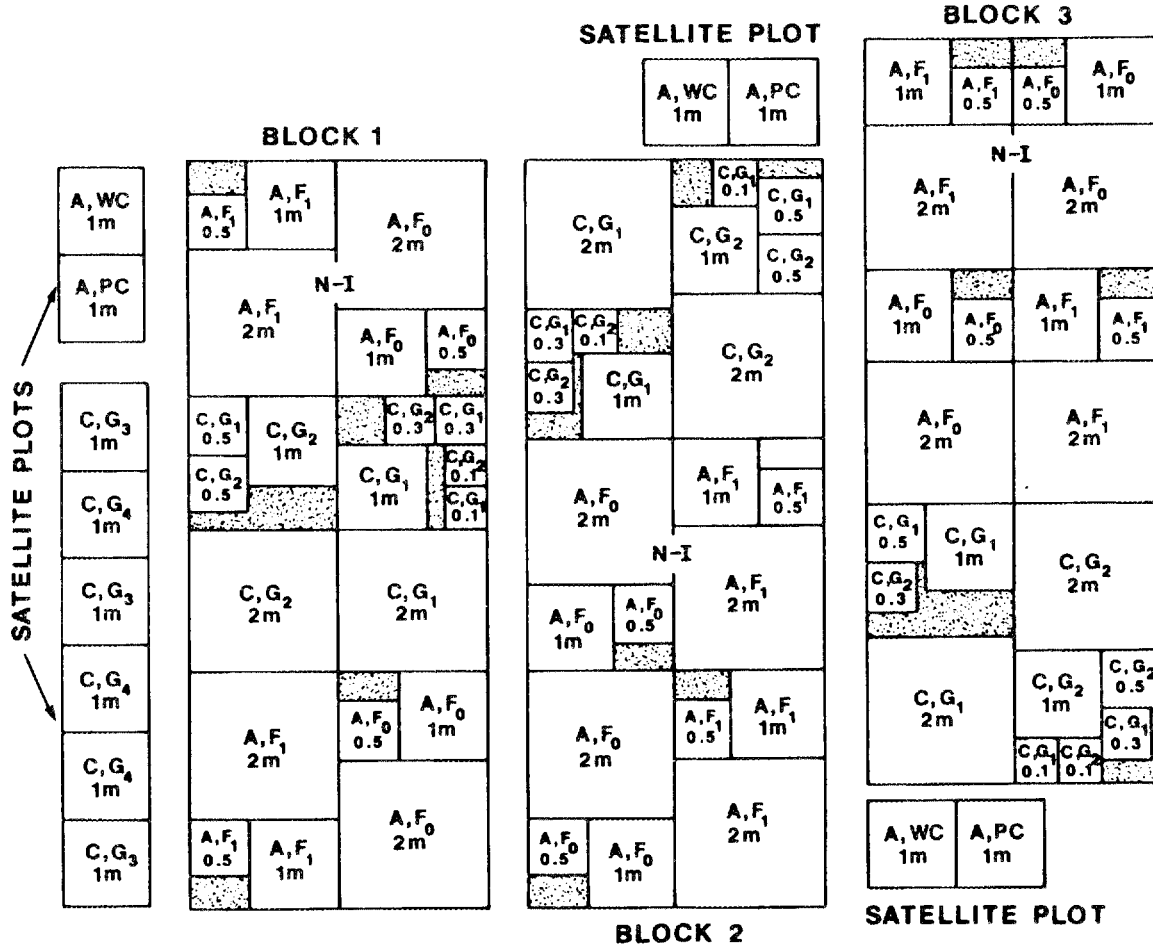


Fig. 6. Case in which the plantation has two intermingled tests (e.g., poplar and alder trials). TESTAREA for the poplar test must be calculated by summing all poplar treatments. BLOCKAREA for poplars includes the area of 1/3 of the poplar satellite plots and the area of other poplar treatments within a block. TRTAREA varies.

MTREEREP	Number of measurement trees in each individual treatment plot (within a replicate). If this varied from year to year, give minimum number of trees measured per treatment during the investigation.
FAMREP*	Number of families per treatment (within a replicate).
TFAMREP*	Number of trees per family per treatment (per replicate)
TCLONREP*	Number of clones per treatment (within a replicate).
RAMTCLON*	Number of ramets per clone per treatment (per replicate)
TDENSITY	Estimated number of trees per hectare.
CDENSITY	Closest density in a Nelder-type plot.
WDENSITY	Widest density in a Nelder-type plot.
ROWSPACE	Meters between rows. In bedded plantations, meters between rows within a bed.
TREESPACE	Meters between trees within a row.
BEDSPACE	Meters between beds, where used.
MAPNFILE	A detailed test layout map resides in ORNL files.
CLASS	Select one of the following classification categories. <u>genetic</u> : genetic comparisons, many treatments with <17 trees/treatment plot, often row plots. <u>exploratory</u> : any type comparisons, usually factorial designs, with <225 total trees/treatment plot. <u>experimental</u> : trials for biomass estimation, with >225 trees/treatment plot. <u>pilot</u> : scaled-up experimental trials ranging in size from 2 to 40 ha per treatment. <u>operational</u> : commercial plantations of approximately more than 40 ha in total size.

*These variables are only applicable to tests such as species trials where more than one family or clone is used in evaluating each species, but each family or clone is not considered a separate treatment.

FILE NAME: SITE PREPARATION
 FILE CODE: SITEPREP
 FILE NUMBER: 15

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
Preplant procedures		
CULTVATD	Cultivation (type)	12r
STUMPRMV	Stump Removal (yes or no)	3r
HERBUSED	Herbicides Used (yes or no)	3r
BEDDING	Bedding (yes or no)	3r
WINDROWD	Windrowed (yes or no)	3r
SLASHCHP	Slash Chopping (yes or no)	3r
BURN	Burn (yes or no)	3r
PLNTMTHD	Planting Method (type) a) hand planted b) machine planted c) other	1r
Amendments at time of planting (answer Yes or No)		
FERTZLN	Fertilization	3r
BANDMLCH	Band Mulching	3r
IRRIGATN	Irrigation	3r
SEEDSOAK	Seedlings Soaked/Dipped	3r

The information is entered for each treatment unless site preparation differences were a treatment variable. Usually site preparation is the same for all treatments in a test, in which case "all" can be substituted for the individual treatment codes and the data entered only once for each test. If all tests at a site received exactly the same site preparation, then "all" can also be substituted for test codes. All other responses are either a "yes" or "no" answer except for the data items explained below.

<u>Data Item</u>	<u>Definition</u>
CULTIVATD	Type of cultivation such as "deep plowed and disked."
PLNTMTHD	Indicate whether planting done by hand or by machine. If "Other" option is chosen, full description will be entered in the Comments File (file 31).

FILE NAME: TREATMENT PLANTING STOCK SOURCE
 FILE CODE: TRTPS1
 FILE NUMBER: 16

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
SPECIES	Genus and Species or Hybrid Codes	8r
CLONE	Name or Number of clone	8r
COLLRNG	Collection Range for Provenance Tests	20r
MTRLSRC	Material Source for Yield Tests	40r
HISTORY	Genetic History of Planting Stock (input applicable information) Bulk Provenance Bulk Stand Half-Sib Full-Sib Identified clones Mixed Clones	60r
PLNTMATL	Planting Material Type (select one) a) cutting unrooted b) whip unrooted c) rooted cutting d) bareroot seedling e) containerized seedling f) seed g) tissue culture plantlet h) root cuttings i) other	1r
AGEPLMTL	Age of Planting Material (months)	dd.d
HGTPLMTL	Height of Planting Material (cm)	ddd.dd
RCDPLMTL	Root Collar Diameter (cm)	ddd.dd
LRQPLMTL	Lateral Root Quality (good, medium, poor, unknown)	7r

This file identifies the species or hybrids used in each treatment and whether or not the material is seedling or clonal.

<u>Data Item</u>	<u>Definition</u>
SPECIES	Species codes are developed by using the first two letters of the genus and species name, e.g., PoDe. An interspecific hybrid is indicated by using the first two letters of the genus and the first two letters of each species name, e.g., PoDeTr). If a variety has been identified, the first letter of the varietal name will be added to the code. Separate records are entered for each species in mixed-species trials.
CLONE	The standard clone name (e.g., NE388) or the name used by the project for recordkeeping purposes. Separate records are entered for each clone within a treatment unless there are more than 5.
COLLRNG	Indicate whether the seedlings or clones used in a provenance test represent the entire range of the species, a specific region, a area within 50 miles, etc. The field is only applicable to provenance/family tests.

- MTRLSRC** Indicate collection source of material for test or individual treatments. Typical answers could be "state nursery," "seeds from local plus trees," "seeds imported from China," etc.
- HISTORY** Indicate the genetic history using as many of the applicable terms as needed:
- BULK PROVENANCE:** Material is a mixture of seedlings from several provenances.
- BULK STAND:** Material is a mixture of seedlings from several mother trees in one stand.
- HALF-SIB:** Seedling material is derived from a single mother tree.
- FULLSIB:** Both parents of the seedling material can be identified.
- IDENTIFIED CLONES:** Test includes numerous clones whose identity is known and will be maintained.
- MIXED CLONES:** Test material is clonal, but identity is not clear or it will not be maintained throughout life of test.
- LRQPLMTL** Unknown: root quality was not considered in seedling selection.
Good: based on qualitative or quantitative assessment.
Medium: based on qualitative or quantitative assessment.
Poor: based on qualitative or quantitative assessment.
NA: not applicable if noncontainerized cuttings used.

FILE NAME: YEARLY MAINTENANCE BY TREATMENT
FILE CODE: YRMNIRT1
FILE NUMBER: 18

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or LAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
OLVLEFF	Overall Level of Effort (H=high, M=medium, L=low)	1r
	Level of Effort Associated with Each Procedure (H=high, M=med, L=low, or N=none)	
EFRTCULT	Cultivation	1r
EFRTMOW	Mowing	1r
EFRTHERB	Herbicide Application	1r
EFRTFERT	Fertilization	1r
EFRTLIM	Liming	1r
EFRTIRGN	Irrigation	1r
EFRTINCL	Insect Control	1r
EFRTDSCL	Disease Control	1r
EFRTBRCL	Browsing Control	1r
EFRTOTHR	Other	1r
COMMENTS	Comments	60r

This is the first of several files that track yearly data for each test and treatment. Information will be entered by ORNL staff after evaluating the information contained in files 19-26. This allows a simplified classification of the various tests by level of intensive culture effort.

<u>Data Item</u>	<u>Definition</u>
CALENYR	The calendar year in which growth occurred if there is a dormant season, otherwise the calendar year is which data was collected, e.g., 1980. This definition applied to all subsequent files in which information is requested on a clendar year basis.
GROWTHYR	The age of the stems within a given rotation, e.g., 4 or 1.5. It can be expressed as a fraction of a year to allow for the year round growing seasons in the subtropics and/or the situation where initial planting occurs halfway through a growing season. Following complete harvest of a plot, GROWTHYR will restart at 1.
ROTATION	Seedling growth = rotation 1, first coppice = 2, etc.
COMMENTS	Use comments field for additional explanations.

FILE NAME: YEARLY MAINTENANCE (HERBICIDES)
 FILE CODE: YRMNTHB
 FILE NUMBER: 19

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
HBMONTH	Month Applied	5r
HERBNAME	Herbicide Name	20r
HERBTYPE	General Type	20r
HBAPPLRT	Application Rate (kg/ha)	dddd.dd
HBAPPLMD	Application Method	40r
HBESTCST	Estimated Cost per Hectare	\$dddd.dd
HBEFTV	Effectiveness for Weed Control (G=good,F=fair,P=poor)	1r
HBEFCTRE	Effect on Trees NO no negative effect SL slight negative effect, e.g., few brown leaves UD undesirable effect, e.g., growth stunted VN very negative effect, e.g., high mortality	2r
COMMENTS	Comments	60r

If more than one application is made in a year, or more than one herbicide applied, separate records are to be entered for each herbicide applied and each time (month) it is applied.

<u>Data Item</u>	<u>Definition</u>
HBMONTH	Standard three-letter abbreviation for month and year actually applied (i.e., May88).
HERBNAME	The generic name rather than brand name.
HERBTYPE	Precemergent or postemergent.
HBAPPLRT	Application rate or amount in kg/ha.
HBAPPLMD	Application method, e.g., sprayer, backpack, airplane.
HBESTCST	Estimate of cost for single application (\$/ha).
HBEFTV	Qualitative judgment of effectiveness of this specific application for control of target plants. This is not a general assessment of the product.
HBEFCTRE	Qualitative judgment of effect on SRIC trees for this specific application rate and time.

FILE NAME: YEARLY MAINTENANCE (FERTILIZER)
 FILE CODE: YRMNTFT
 FILE NUMBER: 20

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
FTMONTH	Month Applied	5r
FTN	%N	ddd.d
FTP	%P	ddd.d
FTK	%K	ddd.d
FTAPPLMD	Application Method	12r
FTNAME	Fertilizer Name	20r
FTTYPE	Fertilizer Type	20r
FTAMT	Total Amount applied of N,P &K (kg/ha)	dddd.dd
FTRATEN	Rate of Nitrogen Application (kg/ha)	dddd.dd
FTRATEK	Rate of Potassium Application (kg/ha)	dddd.dd
FTRATEP	Rate of Phosphorus Application (kg/ha)	dddd.dd
FAMTREE	Total Fertilizer Amount Applied/Tree (gm/tree)	dddd.dd
FTEFFECT	Effectiveness in Altering Soil Fertility (POS=positive, NEG=negative, NON=none, UD=undetermined)	3r
COMMENTS	Comments	60r

This information is entered at least once each year for each treatment if fertilizer is used. "All" may be used for the treatment code if the application to all treatments is the same. A new record is created for each fertilizer application.

<u>Data Item</u>	<u>Definition</u>
FTMONTH	Standard three-letter abbreviation for month and year actually applied (i.e., May88).
FTN	Percent nitrogen in active fertilizer.
FTP	Percent phosphorus in active fertilizer.
FTK	Percent potassium in active fertilizer.
FTAPPLMD	Application method, e.g., hand, tractor, airplane, irrigation.
FTNAME	Fertilizer name, e.g., Oscomote.
FTTYPE	Fertilizer type, e.g., slow release, soluble, liquid.
FTAMT	Total weight of active fertilizer applied (kg of N, P, and K combined on a per hectare basis).
FTRATEN	Rate of elemental N application (kg/ha) when applied alone.
FTRATEP	Rate of elemental P application (kg/ha) when applied alone.

FTRATEK Rate of elemental K application (kg/ha) when applied alone.

FAMTREE Total weight of bulk fertilizer (grams of N, P, and K) applied to each tree; applicable only if fertilizer was applied directly to individual trees rather than on an area basis.

FTEFFECT Effect of fertilizer in altering soil fertility based on soil and/or leaf analysis or on productivity responses where comparison plots available. Response choices area as follows:
Positive: statistically significant positive effect for species being grown
None: no observable or measurable change in soil fertility
Negative: overall negative effect for species being grown
Undetermined: no control for comparison

COMMENTS Use this field to explain any unusual or extenuating circumstances.

FILE NAME: YEARLY MAINTENANCE (PEST CONTROLS)
 FILE CODE: YRMNTPC
 FILE NUMBER: 21

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
PCMONTH	Month Applied	5r
PCCTLSUB	Control Substance	20r
PCEFTV	Effectiveness for Insect or Disease Control (G=good,F=fair,P=poor)	1r
PCAPPLMD	Application Method	20r
COMMENTS	Comments	60r

Information is entered once for each application of a chemical substance for control of pests. "All" may be used for the treatment code if the application to all treatments is the same. A new record is created for each different application.

<u>Data Item</u>	<u>Definition</u>
PCMONTH	Standard three-letter abbreviation for month and year actually applied (i.e., May88).
PCCTLSUB	Pest control substance used, preferably the generic name. This can include controls for rabbits, insects, fungus, etc.
PCEFTV	The effectiveness of the substance in controlling target pests or diseases for this specific test or treatment is rated.
PCAPPLMD	Application method, e.g., hand sprayer, tractor sprayer, airplane.
COMMENTS	Use the comments field to explain any unusual or extenuating circumstances.

FILE NAME: YEARLY MAINTENANCE (CULTIVATION)
 FILE CODE: YRMNTCT
 FILE NUMBER: 22

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
CTMONTH	Month	5r
CTMETHOD	Method	20r
CTEFTV	Effectiveness for Competition Reduction (G=good,F=fair,P=poor)	1r
COMMENTS	Comments	60r

This information is entered once for each cultivation of a test or treatment following planting. As in previous files, use "all" where appropriate.

<u>Data Item</u>	<u>Definition</u>
CTMONTH	Standard three-letter abbreviation for month and year actually cultivated (i.e., May88).
CTMETHOD	Describe cultivation methods (20 characters or less).
CTEFTV	Effectiveness of cultivation for competition reduction (weed control) should be evaluated based on results in the specific named test rather than an overall subjective opinion of cultivation effectiveness.
COMMENTS	Use the comments field to explain any extenuating circumstances

FILE NAME: YEARLY MAINTENANCE (MOWING)
 FILE CODE: YRMNTMW
 FILE NUMBER: 23

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
MWMONTH	Month	5r
MWEQUIP	Equipment	20r
MWEFTV	Effectiveness for Competition Reduction (G=good,F=fair,P=poor)	1r
COMMENTS	Comments	60r

Information is entered once for each time a test or treatment is mowed. Use "all" where appropriate.

<u>Data Item</u>	<u>Definition</u>
MWMONTH	Standard three-letter abbreviation for month and year actually mowed (i.e., May88).
MWEQUIP	Size of mower used.
MWEFETV	Effectiveness of mowing for keeping competing vegetation under control in the specified test.
COMMENTS	Additional information or explanation of procedures.

FILE NAME: YEARLY MAINTENANCE (BROWSING CONTROL)
 FILE CODE: YRMNTBC
 FILE NUMBER: 24

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
BCMETHOD	Method	20r
BCEFTV	Effectiveness (G=good,F=fair,P=poor)	1r
COMMENTS	Comments	60r

The file is updated yearly for each test or site at which browsing control methods are needed. Even though fences may be permanent and thus built only once, a new record will be added to the database for each year that a fence is kept in place. Use "all" where appropriate.

<u>Data Item</u>	<u>Definition</u>
BCMETHOD	A descriptive term such as fencing, trapping, etc. (chemical control methods should be entered in file 21).
BCEFTV	Indicate level of effectiveness of above methods for controlling browsing in the specified tests or treatments.
COMMENTS	Additional explanations or descriptions of procedures.

FILE NAME: YEARLY MAINTENANCE (IRRIGATION)
 FILE CODE: YRMNTIR
 FILE NUMBER: 25

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
IRGNMTHD	Irrigation Method a) moveable sprayer b) well water c) drip system d) other	1r
IRGNWS	Irrigation Water Source a) river/lake/pond water b) well water c) waste water d) other	1r
AMTWATER	Total Amount Water Added/Year (liters)	dddddd.dd
SOILTENS	Soil Tension Maintained	20r
IRGNRELI	Reliability of Irrigation Method (G=good,F=fair,P=poor)	1r
COMMENTS	Comments	60r

New records should be added annually for each year irrigation is used. Use "all" where appropriate.

<u>Data Item</u>	<u>Definition</u>
IRGNMTHD	Examples of available options are: a) Moveable sprayer system, e.g., traveling guns. b) Stationary sprayer system, e.g., impact sprinklers connected with buried lateral lines. c) Drip system - temporary or permanent drip type systems. d) Other - describe in comments.
IRGNWS	Use available choices or "other" with explanation in comments.
AMTWATER	Amount of water used for irrigation in terms of liters/hectare.
SOILTENS	Range of soil tension expressed as bars.
IRGNRELI	Did the irrigation equipment operate effectively when needed?

FILE NAME: YEARLY MAINTENANCE (LIMING)
 FILE CODE: YRMNTLM
 FILE NUMBER: 26

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
LMMONTH	Month Applied	5r
LMAPPLMD	Application Method	40r
LMAMT	Total Amount (kg/ha)	dddddd.dd
LMEFFECT	Soil Fertility Effect (<u>positive</u> , <u>negative</u> <u>none</u> , <u>undetermined</u>)	3r

New records should be created for each year or month lime is applied. Use "all" where appropriate.

<u>Data Item</u>	<u>Definition</u>
LMMONTH	Standard three-letter abbreviation for month and year actually applied (i.e., May88).
LMAPPLMD	Description of application methods in 40 characters or less.
LMAMT	Total amount of lime added expressed as kilogram/hectare.
LMEFFECT	Enter the first three letters of one of the four choices. Assess the soil fertility effect based either on growth responses of trees relative to unlimed conditions.

FILE NAME: WOOD QUALITY CHARACTERISTICS
 FILE CODE: WOODQUAL
 FILE NUMBER: 27

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
MOISTURE	Moisture Content on a Dry Weight Basis	%d.dd
SPECGRAV	Specific Gravity	ddd.dd
HEAT	Gross Heat of Combustion (cal/g)	dddddd.dd
CARBON	Carbon (% of Oven Dry Weight)	ddd.dd
HYDROGEN	Hydrogen (% of Oven Dry Weight)	ddd.dd
OXYGEN	Oxygen (% of Oven Dry Weight)	ddd.dd
NITROGEN	Nitrogen (% of Oven Dry Weight)	ddd.dd
PHOSPHOR	Phosphorus (% of Oven Dry Weight)	ddd.dd
POTASSIM	Potassium (% of Oven Dry Weight)	ddd.dd
CALCIUM	Calcium (% of Oven Dry Weight)	ddd.dd
MAGNESIM	Magnesium (% of Oven Dry Weight)	ddd.dd
ASH	Ash Content (% of Oven Dry Weight)	ddd.dd
EXTRACT	Extractive Content (% of Oven Dry Weight)	ddd.dd
HC	Hollocellulose (% of Oven Dry Weight)	ddd.dd
AC	Alphacellulose (% of Oven Dry Weight)	ddd.dd
LIGNON	Klason Lignon Content (% of Oven Dry Weight)	ddd.dd
SUGARS		
GLUCOSE	Glucose (% of Oven Dry Weight)	ddd.dd
XYLOSE	Xylose (% of Oven Dry Weight)	ddd.dd
GALACTOSE	Galactose (% of Oven Dry Weight)	ddd.dd
ARABINOSE	Arabinose (% of Oven Dry Weight)	ddd.dd

This file attempts to determine what measurements other than harvested weights were taken to determine biomass production estimates and is under development at the present time. A new record should be created each year that measurements are made.

Data Item Definition

MOISTURE Percent moisture expressed as:

$$\frac{\text{wet weight} - \text{dry weight}}{\text{dry weight}} \times 100$$

SPECGRAV Specific gravity expressed as g/cm³

FILE NAME: YEARLY HARVEST INFORMATION
FILE CODE: YRHARVIN
FILE NUMBER: 28

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
TOTREPHV	Treatment (rep) Totally Harvested (yes or no)	3r
PARREPHV	Treatment (rep) Partially Harvested (yes or no)	3r
NUMREPHV	Number of Replicates of a Treatment Harvested	ddd
NUMTREHV	Number Trees/Treatment/Replicate Harvested	dddd
INDTREEW	Individual Trees Weighed (yes or no)	3r
TREEBLKW	Trees Bulk-Weighed (yes or no)	3r
LEAVES	Leaves Included (yes or no)	3r
REFREPT	Reference	30r

The object of file is to determine how biomass yields are derived. Information is entered only for years and treatments actually harvested to obtain biomass yields.

<u>Data Item</u>	<u>Definition</u>
TOTREPHV	Are all trees in a named treatment replicate harvested and weighed to determine yields?
PARREPHV	Are only a portion of the trees in the named treatment replicate weighed to determine yield estimates?
NUMREPHV	Number of replicate plots of a treatment harvested to determine average yield.
NUMTREHV	Number of trees from a treatment plot (within a replicate) harvested and weighed for yield estimates.
INDTREEW	Were trees weighed individually to get estimate of the within-plot variation?
TREEBLKW	Were trees bulk-weighed either whole or as chips?
LEAVES	Were leaves on trees when wet weights obtained?
REFREPT	Reference to a publication or report which will provide additional explanation for how equation was developed or how it was used.

FILE NAME: YEARLY HARVEST METHODS
 FILE CODE: YRHARVMD
 FILE NUMBER: 29

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
MONTH	Month	5r
CUTMTHD	Method of Cut a) manual (e.g., chain saw, brush cutter) b) mechanical (but individual trees) c) prototype (multiple-tree harvester) d) commercial (multiple-tree harvester) e) other (any harvest method not covered by above categories)	3r
RMVMTHD	Method of Removal a) manual skidding b) grapple skidder c) other	1r
AVGSTHGT	Average Stump Height (cm)	ddd.dd
AVGSTANG	Average Stump Angle (degrees)	dd
AVGSTDIA	Average Stump Diameter (cm)	ddd.dd
PTSTPDMG	Percent Stumps Damaged	%dd.dd
COMMENT	Definitions	60r

Information is entered only for years and treatments actually harvested.

<u>Data Item</u>	<u>Definition</u>
MONTH	Standard three-letter abbreviation for month and year actually cut (i.e., May88).
CUTMTHD	General category of harvest method. If "other" is chosen, explain the method in the comment field.
RMVMTHD	Method of removal from stump to landing. Choice of "other" should be explained in the comment field.
COMMENTS	Definition of "other" cutting and removal methods.

FILE NAME: YEARLY BIOMASS YIELDS PER TEST
 FILE CODE: YRYLDTST
 FILE NUMBER: 30

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
ROOTAGE	Rootage	dd.dd
MMONTH	Measurement Month	5r
NTREP	Number Trees/Rep Measured	dddd
PSPRT	Percent Sprouts/Tree Measured	ddd.dd
NSPRT	Number Sprouts/Tree Measured	ddd
NREP	Number of Treatment Reps. Measured	ddd
SELECSRV	Percent Survival of "Select" Group	ddd.dd
SELECYLD	Biomass Yield (dry Mg/ha) of Select Group	dddddd.dd
SELHT	Average Height of "Select Group (m)	ddd.dd
SELDBH	Average Diameter Breast Height of "Select" Group (cm)	ddd.dd
SELDSH	Average Diameter Stump Height (cm)	ddd.dd
ALLSRV	Percent Survival of All Groups	ddd.dd
ALLYLD	Biomass Yield (dry Mg/ha) of All Groups	dddddd.dd
ALLHT	Average Height of All Groups (m)	ddd.dd
ALLDBH	Average Diameter Breast Height of All Groups	ddd.dd
ALLDSH	Average Diameter Stump Height of All Groups	ddd.dd
CONTRYLD	Biomass Yield (dry Mg/ha) of Control	ddd.dd
SELECTGP	Please describe Select Group	60r
CONTROL	Please describe Control Data	60r
COMMENTS	Comments	60r

Tests in the "genetic" or "exploratory" classification categories may be summarized in this file and not recorded in detail in file 31. In most instances the TREATMNT code would be left blank since data will be summarized for a whole test.

<u>Data Item</u>	<u>Definition</u>
MMONTH	Standard three-letter abbreviation for month and year actually measured (i.e., May88).
NREP	Number of replicate treatment plots in which measurements were made.
NTREP	Number of trees per treatment per replicate actually measured.
PSPRT	Percent of sprouts per tree measured on average in coppice plots.
NSPRT	Number of sprouts per tree measured on average in coppice plots.
SEL*	All field beginning with SEL refer to select group which is described in the field SELECTGP.
ALL*	All fields beginning with ALL, refer to all treatments in a test.

CONTRYLD The yield of a control group or treatment.

SELECTGP Defined by the investigator. It could be the single best treatment, the 10 best clones, etc.

CONTROL Could be a "standard" or native clone or a cultural treatment with no amendments added.

COMMENTS Unusual or extenuating circumstances affecting yields.

FILE NAME: YEARLY BIOMASS YIELDS PER TREATMENT
 FILE CODE: YRYLDTRT
 FILE NUMBER: 31

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year or Stem Age	dd.dd
ROTATION	Rotation	dd
ROOTAGE	Rootage	dd.dd
MMONTH	Measurement Month	5r
PCTSURV	Percent Survival	%ddd.dd
BIOYIELD	Biomass Yield (dry Mg/ha)	ddd.dd
STDDEV	Yield Standard Deviation (dry Mg/ha)	ddd.dd
HEIGHT	Average Height (m)	ddd.dd
DBH	Average Diameter Breast Height (cm)	ddd.dd
DSH	Average Diameter Stump Height (cm)	ddd.dd
NREP	Number of Replicates Measured	dddd
NTREP	Number Trees/Rep Measured	dddd
PSPRT	Percent Sprouts/Tree Measured	ddd.dd
NSPRT	Number Sprouts/Tree Measured	ddd
COMMENTS	Comments	60r

This is the appropriate file for data from trials classed as "experimental," "pilot," or "operational." Information from "genetic" or "exploratory" trials may also be contained in this file. This file is the bottomline information that is associated with all the parameters reported in the previous 30 files.

<u>Data Item</u>	<u>Definition</u>
MMONTH	Standard three-letter abbreviation for month and year actually measured (i.e., May88).
BIOYIELD	Total accumulated average yield of named treatments expressed as dry Mg/ha. Mean annual yields and periodic annual yields will be calculated as needed.
NREP	Number of replicate treatment plots in which measurements were made.
NTREP	Number of trees per treatment per replicate actually measured.
PSPRT	Percent of sprouts per tree measured on average in coppice plots.
NSPRT	Number of sprouts per tree measured on average in coppice plots.
COMMENTS	Include reasons for lower-than-expected yield such as species off-site, drought, flooding, poor quality planting stock, poor site preparation, weed competition, insect pests, disease problems, animal browse, etc. Adequate space is available for a detailed response.

FILE DESCRIPTION: YEARLY BIOMASS EQUATIONS
FILE NAMES: YRBIOEQU
FILE NUMBER: 32

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
DATEMOD	Date Record Modified	dddd
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	12r
SPECIES	Genus and Species or Hybrid Codes	8r
CALENYR	Calendar Year	dddd
NUMTREES	Number of Trees Used to Develop Equation	dddd
EQUATION	Equation	60r
REFREPT	Reference	30r
COMMENTS	Comments	300r

This file will eventually contain the equations used by SRWCP researchers to derive yearly biomass yield estimates; at the present time, it is still under development.

<u>Data Item</u>	<u>Definition</u>
SITE	Name site only if equation specific to a given site.
TESTNAME	Enter testname only if equation specific to the test.
TREATMNT	Enter treatment only if equation specific to a treatment.
SPECIES	Use same code for species as used in file 16.
CALENYR	Enter the calendar year in which the equation was first used for estimating yields published in SRWCP annual reports or papers. A new record will be created for each time the equation is revised or updated.
NUMTREES	Number of trees used in developing the equation.
EQUATION	Regression equation for biomass yield of a single tree based on measurement parameters. PI's should define terms used in a comment. Database manager may standardize all terms for input into database.
REFREPT	Reference to a publication or report which will provide additional explanation for how equation was developed or how it was used.
COMMENTS	Additional information needed for using equation, such as age or size range over which equation is applicable, definition of terms in equation, and procedures for scaling up to a per hectare estimate of yield.

FILE DESCRIPTION: COMMENTS
 FILE NAMES: COMMENTS
 FILE NUMBER: 33

<u>DATA ITEM</u>	<u>DESCRIPTOR</u>	<u>PICTURE</u>
SUBNUM	Subcontract or Grant or IAG Number	8r
KEYNAME	Key Name	8r
COMDATE	Date Comment Entered	dd/dd/dd
COMMENTE	Person Entering Comment	rrr
COM1	First Line of Comment	60r
COM2	Second Line of Comment	60r
COM3	Third Line of Comment	60r
COM4	Fourth Line of Comment	60r
COM5	Fifth Line of Comment	60r

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