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ORNL/TM-9959

The Short Rotation Woody Crops Program Computerized Technical Data Base System

J. W. Hodges

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COMPUTING AND TELECOMMUNICATIONS

THE SHORT ROTATION WOODY
CROPS PROGRAM COMPUTERIZED
TECHNICAL DATA BASE SYSTEM

J. W. Hodges

Date Published - March 1986

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OAK RIDGE NATIONAL LABORATORY
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The design and development of the Short Rotation Woody Crops Program (SRWCP) Computerized Technical Data Base System was funded by the Environmental Sciences Division at Oak Ridge National Laboratory. The system provides data management support for the SRWCP, which is sponsored by the U. S. Department of Energy's Biomass Energy Technology Division. The author wishes to thank L. L. Wright of the Environmental Sciences Division for identifying the technical and data requirements for the SRWCP Data Base System and for being very supportive and providing all of the needed materials and services throughout the development of the SRWCP Data Base System. The author wishes to especially thank L. R. Layman for his support and guidance on this project and for being the mentor that he has been. The author is also grateful to E. B. Lewis for his assistance during the testing of the system, and to J. W. Ranney for providing insight into the goals and objectives of the SRWCP. Finally, the author wishes to thank Ann Keating, Deborah Barnes, and Rachel Scogin for their assistance in preparing this document.

ABSTRACT

A computer system has been implemented to provide data management, analysis, and reporting capabilities for the Short Rotation Woody Crops Program (SRWCP). The SRWCP conducts and manages research on the production of woody biomass for energy. The computer system manages all of the SRWCP subcontract technical information and provides data analysis and reporting capabilities to SRWCP management.

INTRODUCTION

The Environmental Sciences Division (ESD) at Oak Ridge National Laboratory (ORNL) has been managing the SRWCP since 1979. The SRWCP is sponsored by the U. S. Department of Energy's Biomass Energy Technology Division. The program's objective is to improve the productivity and efficiency of the short-rotation intensive culture (SRIC) of hardwood trees and shrubs for energy. The major components of the SRWCP focus are (1) selection and improvement of promising species, (2) stand establishment and management strategies, (3) economic evaluation, and (4) management and program synthesis. The SRWCP has subcontracted biomass research to over 30 institutions across the United States.

The SRWCP Computerized Technical Data Base has been installed at ESD to provide adequate data management, analysis, and reporting capabilities for the SRWCP. Previously, synthesis of data from subcontracting institutions and support of the program's management functions were accomplished manually. The SRWCP Computerized Technical Data Base will be used to collect and integrate all the subcontract information and to provide rapid data analysis and reporting capabilities for the SRWCP management. An IBM PC with a 10-megabyte hard disk was selected for this task. The IBM PC-DOS operating system and the KNOWLEDGEMAN data base management system were the software chosen to be used on the IBM PC.

SECTION 1.0 THE SRWCP

1.1 RESEARCH FOCUS

Plantation hardwood management emerged in the late 1960s as a method of producing feedstocks for the pulp and paper industry. This management scheme generally was characterized by spacings of three to four meters and rotation lengths of 15 to 30 years. In the late 1970s it became apparent that energy needs could place additional demands on wood supplies. The Department of Energy (DOE) began to look upon wood as a renewable supply of energy and became interested in the idea of short rotation intensive culture (SRIC) plantations. SRIC plantations are characterized by shorter rotation ages and closer spacings than those used for growing pulpwood. In 1978 DOE initiated the SRWCP as the first comprehensive, nationwide program on SRIC energy research. The program was designed to create an information base on SRIC for energy which the private sector could use to build a biomass energy market. The program's research has the objective of optimally maximizing yields and minimizing costs of producing wood in SRIC systems. Research in the program is focused on (1) species screening and genetic selection, (2) stand management alternatives, (3) economic evaluations, and (4) nutrient utilization and site productivity.

1.2 SRWCP SUBCONTRACTORS

Much of the SRIC research involves subcontracting elements of the

effort to universities and corporations. These institutions plant, grow, and harvest different species of trees and shrubs under varying conditions to identify the most efficient methods and species for SRIC. Between 1973 and 1985, field research was conducted by approximately 23 institutions at 85 sites in the United States.

1.3 SRWCP DATA REQUIREMENTS

Subcontracting institutions were required to collect technical data on SRIC research that was conducted and forward this information to the SRWCP as quarterly and annual progress reports. After six years of program existence, the technical information available to the program had grown to the point where computerization of the information was essential to its effective utilization. Over 300 distinct items of data were identified as being information desired from each subcontractor. The data items had a hierarchical relationship which resulted in the need for thousands of actual data values to be reported by each subcontractor in any given year. Since the data are to be collected for five to ten years or more, the SRWCP computer system was installed to manage all of the subcontractor data and provide analysis and report generating capabilities to SRWCP management.

SECTION 2.0 THE SRWCP COMPUTER

2.1 STANDARD EQUIPMENT

The IBM PC was selected to handle data management for the SRWCP and provide quick and efficient access to the data. The computer includes the following components:

1. Intel 8088 microprocessor
2. 512 kilobytes RAM
3. Two 360-kilobyte floppy disk drives
4. 10-megabyte hard disk expansion unit
5. Princeton Graphics color monitor
6. Keytronic KB 5151 keyboard
7. Epson FX100 parallel printer
8. HP 7475A pen plotter
9. Hayes 1200 Smartmodem

2.2 PURCHASED SOFTWARE

The IBM PC runs under the PC-DOS operating system supplied by the vendor. The KNOWLEDGEMAN data base management system was purchased from Micro Data Base Management Systems, Inc., to serve as a kernel of data management software in which procedures to handle the data management needs of the SRWCP could be developed. Additional software purchases were an MSDOS BASIC programming interpreter and a Smartterm 100 terminal emulator.

SECTION 3.0 SRWCP DATA BASE

3.1 SRWCP DATA BASE DESCRIPTION

The SRWCP data base is a collection of 31 files that collectively represent all of the data items reported on and by subcontracting institutions for the program. The 31 files are ordered into a relational data base schema. This configuration is optimal in that it will allow any data item in any file to be joined with any item in any other file with a minimum of complexity. The reporting ease comes, however, with a degree of data redundancy inherent in relational schemas. This data redundancy is minimal and controlled, however, with the integrity of the data ensured. The logical description of the data base is presented in Fig. 1. A cross-reference of the file names and what they represent is provided in Table 1. An example layout of a data record for each of the files is presented in Sect. 3.2. All data items and relationships are in third normal form according to Martin (1977). The data management software operates on this assumption and all data retrievals and reports are performed on the files and data items as they exist in third normal form.

3.2 SRWCP FILE LAYOUTS

The data items in each of the files the SRWCP data base comprises are presented on pages 9 through 39 of this report. The file name and number are presented in the title information for reference. For each file, the data item name is followed by a description and a picture. A lowercase 'r' represents an alphanumeric character. A

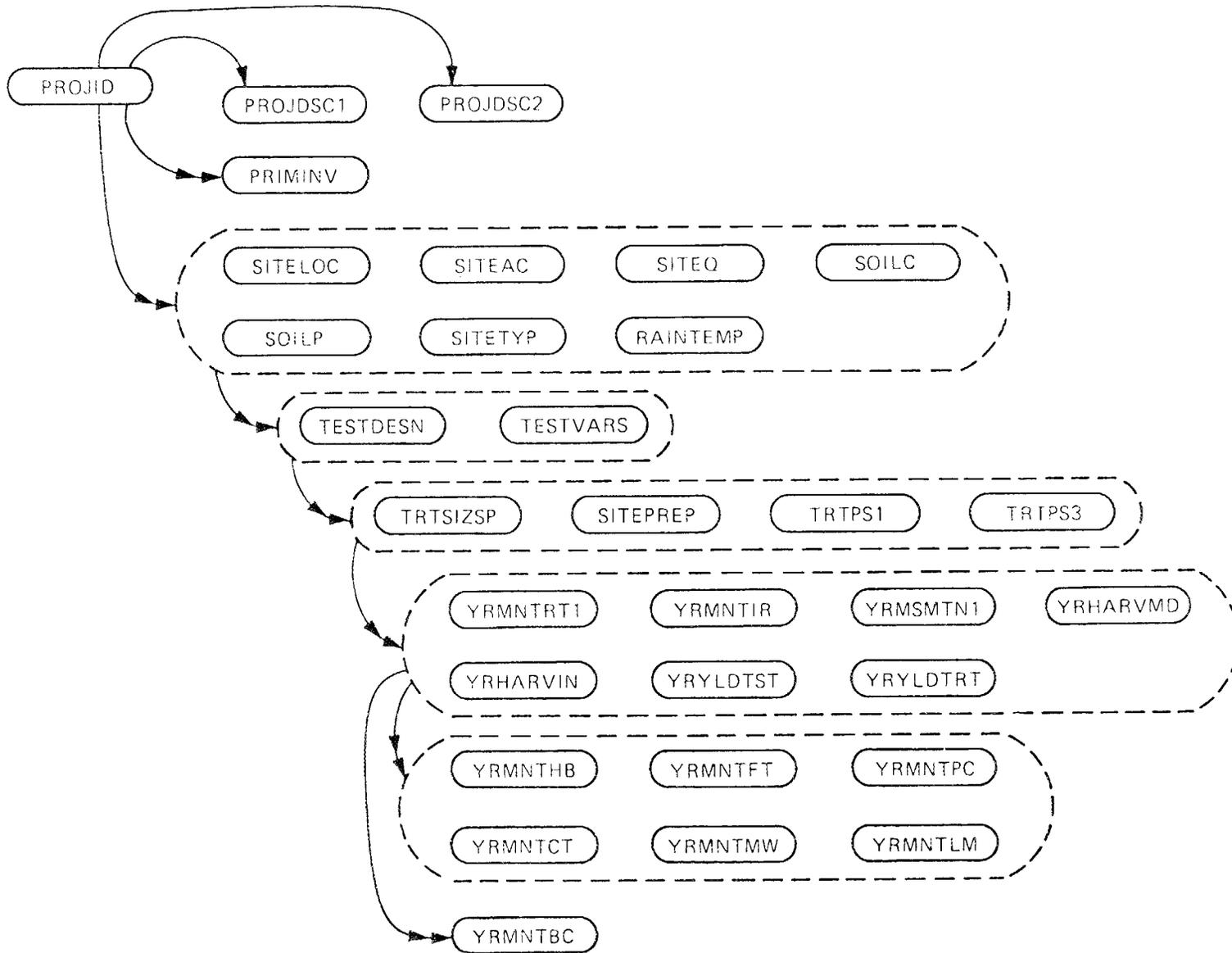


Figure 1. SRWCP Database Logical Description.

Table 1

SRWCP Data Base File Identification Reference

File Name	File ID	File Number
Project Identification	PROJID	1
Primary Investigator	PRIMINV	2
Project Publication List	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 Rainfall and Temperature Data	RAINDATA	11
Test Design	TESTDESN	12
Test Variables	TESTVARS	13
Treatment Size/Spacing	TRTSIZSP	14
Site Preparation	SITEPREP	15
Treatment Planting Stock Source	TRTPS1	16
Treatment Planting Stock Quality	TRTPS3	17
Yearly Maintenance/Treatment	YRMNTRT1	18
Yearly Maintenance (Herbicides)	YRMNTHB	19
Yearly Maintenance (Fertilizer)	YRMNTFT	20
Yearly Maintenance (Pest Control)	YRMNTPC	21
Yearly Maintenance (Cultivation)	YRMNTCT	22
Yearly Maintenance (Mowing)	YRMNTMW	23
Yearly Maintenance (Browse Control)	YRMNTBC	24
Yearly Maintenance (Irrigation)	YRMNTR	25
Yearly Maintenance (Liming)	YRMNTLM	26
Yearly Measurement Information	YRMSMTN1	27
Yearly Harvest Information	YRHARVIN	28
Yearly Harvest Methods	YRHARVMD	29
Yearly Biomass Yields/Test	YRYLDTST	30
Yearly Biomass Yields/Treatment	YRYLDTRT	31

NOTE: The File ID should be preceded by the drive designator D:\SRWCPDAT\ and succeeded with the extension .ITB to represent the actual data file name. The FILE ID should be preceded by the drive designator D:\SRWCPIPF\ and succeeded with the extension .IPF to represent the actual template generation source file.

number preceding the lowercase 'r' represents the number of characters in the data item. A lowercase 'd' represents a numeric digit. A decimal point in the field indicates where the decimal point resides for that particular data item.

FILE NAMES: PROJID.ITB PROJID.IPF
 FILE DESCRIPTION: Project Identification
 FILE NUMBER: 1

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
INSTITUT	Institution	8r
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
UPDTDATE	Date of Latest Update	dd-dd-dddd

FILE NAMES: PRIMINV.ITB PRIMINV.IPF
 FILE DESCRIPTION: Principal Investigator
 FILE NUMBER: 2

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant 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

FILE NAMES: PROJ DSC1.ITB PROJ DSC2.ITB
FILE DESCRIPTION: Publication List
FILE NUMBER: 3

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
PROJTITL	Full Title of Project	200r
PBLPPRS	List of Published Papers	200r

FILE NAMES: PROJSDC2.ITB PROJSDC2.IPF
 FILE DESCRIPTION: Project Type of Research
 FILE NUMBER: 4

DATA ITEM	DESCRIPTOR	PICTURE
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
	Insert an X for each item collected	
GRTHRATE	Growth Rate Information (height, diameter, etc.)	3r
BYLDEST	Total Biomass Yield Estimates (wet and dry weights)	3r
EYLDEST	Total Energy Yield Estimates (kcal/g)	3r
TREEBYLD	Tree Component Biomass Yields	3r
TREEEYLD	Tree Component Energy Yields	3r
WOODCHAR	Wood Characteristics (eg. bulk density, specific gravity, %ash)	3r
	y	
NUTRBUDG	Nutrient Budget Information (eg. soil nutrients, foliar nutrients, soil nutrient status change)	3r
PHYSCHAR	Structural or Physiological Characteristics (eg. LAI, photosynthesis rate etc.)	3r
GENGAIN	Genetic Gain	3r
COPPSUCC	Coppice Success (eg. #coppice sprouts/stump, %coppicing)	3r
DISEAINC	Disease Incidence	3r
PESTINC	Pest Incidence	3r
BROWFREQ	Browsing Frequency	3r
ECONDATA	Economic Data	3r

FILE NAMES: SITELOC.ITB SITELOC.IPF
FILE DESCRIPTION: Site Location
FILE NUMBER: 5

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
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	ddd.dd.dd
LONGITUD	Longitude	ddd.dd.dd
AREAPLTD	Area Planted (ha)	ddd.dd

FILE NAMES: SITEAC.ITB SITEAC.IPF
 FILE DESCRIPTION: Site Average Climate
 FILE NUMBER: 6

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
AVGFFDAY	Average Number Frost-Free Days per Year	ddd.d
MDEGDAY	Mean Degree-Days (c - days) (assume 5.5 C as base temp)	dddd-dddd
AVGANNRF	Average Annual Rainfall (cm)	dddd.d
AARFSTDV	Standard Deviation	dddd.d
AVGGSRF	Average Growing Season Rainfall (cm)	dddd.d
AGSRSTDV	Standard Deviation	dddd.d
AVGANNSI	Average Annual Solar Insolation (J/M2)	dddd.d
AVGANNPE	Average Annual Pan Evaporation (cm)	dddd.d
EVPTRPDX	Evapotranspiration Index (Thornthwaite)	dddd.d
RAINREGM	Normal Rainfall Regime	8r
NDRYMO	Average Number Months with Rainfall < 3cm	dd-dd
DRYMORF	Avg. amount Rainfall in Driest Month (cm)	dddd
ANNTMAX	Annual Maximum Temperature (deg - c)	ddd-ddd
ANNTMIN	Annual Minimum Temperature (deg - c)	ddd-ddd
ANNTEMP	Average Annual Temperature (deg - c)	ddd-ddd
ANNMI	Annual Moisture Index	dddd

FILE NAMES: SITEQ.ITB SITEQ.IPF
 FILE DESCRIPTION: Site Quality
 FILE NUMBER: 7

DATA ITEM	DESCRIPTOR	PICTURE
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
PASTUSE	Past Use	40r
SITENDEX	Site Index (by timber species and age)	ddd/rrrr/ddd
LANDCLAS	Land Capabality Classes (SCS ratings)	10r
SOILCLAS	Soil Classification Name (according to U.S. Soil Taxonomy)	60r
SOILSERS	Soil Series Name (according to U.S. Soil Taxonomy)	60r
AGRIYIEL	Normal Yield of Agricultural Crop	dddd.dd
SITEQUAL	Opinion of Site Potential Production (Mg/ha/yr)	6r
DEGRADTN	Severity of Soil Degradation	8r
TYPEDGRN	Type of Degradation	15r

FILE NAMES: SOILC.ITB SOILC.IPF
 FILE DESCRIPTION: Soil Chemistry
 FILE NUMBER: 8

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
DEPTH	Depth (cm)	dddd-dddd
HORIZON	Horizon	dddd
WPH	Water pH (standard units)	dd.d-dd.d
SPH	Salt pH (standard units)	dd.d-dd.d
CATIONEP	Cation Exchange Capacity (me/100gm)	dddd.dd
TCALC	Total Calcium (ppm)	dddddd.dd
EXCAL	Exchangeable Calcium (ppm)	dddddd.dd
TPOT	Total Potassium (ppm)	dddddd.dd
EXPOT	Exchangeable Calcium (ppm)	dddddd.dd
TMAG	Total Magnesium (ppm)	dddddd.dd
EXMAG	Exchangeable Magnesium (ppm)	dddddd.dd
TNIT	Total Nitrogen (ppm)	dddddd.dd
MINNIT	Minimum Nitrogen (ppm)	dddddd.dd
TPHOSP	Total Phosphorous (ppm)	dddddd.dd
APHOSP	Available Phosphorous (ppm)	dddddd.dd
PHEXTMTH	Phosphorous extraction method	40r
TCARBON	Total Carbon (%)	%ddd.dd

FILE NAMES: SOILP.ITB SOILP.IPF
 FILE DESCRIPTION: Soil Physics
 FILE NUMBER: 9

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
BULKDENS	Density	ddd.dd
STONINES	Stoniness (% > 2mm)	%ddd.dd
SWSTGCAP	Soil Water Storage Capacity (cm H2O/cm soil)	ddd.dd
PCTSAND	% Sand	%dd-dd
PCTSILT	% Silt	%dd-dd
PCTCLAY	% Clay	%dd-dd
SOILORGM	Soil Organic Matter (%)	%dd-dd
DPTOWTBL	Depth to Watertable (cm)	dddd.dd
DPTOCARB	Depth to Carbonates (cm)	dddd.dd
LIMITHRZ	Depth to Limiting Horizon (cm)	ddd-dddd
DRAINAGE	Drainage Description	30r

FILE NAMES: SITETYP.ITB SITETYP.IPF
 FILE DESCRIPTION: Site Type
 FILE NUMBER: 10

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
SLOPE	Slope %	%dd.dd to %dd.dd
ASPECT	Aspect (N,NE,S,SE,E,W,SW,NW)	rr
ELEVATIO	Elevation	dddddd.dd to ddddddd.dd
TOPOLOC	Topographic Location	10r
	a) upland	
	b) bottomland	
	c) other	
VEGECLAS	Potential Vegetation Classification (Kuchler)	30r
FORESTYP	Forest Type (U.S. Forest Service Rating)	30r
LNDRSCRN	Land Resource Region (National Resource Inventory)	30r
ECOREGN	Ecoregion (R.G. Baily, 1976)	30r
PHYSREGN	Physiographic Region	30r

FILE NAMES: RAINTEMP.ITB RAINTEMP.IPF
 FILE DESCRIPTION: Yearly Rainfall and Temperature Data
 FILE NUMBER: 11

DATA ITEM	DESCRIPTOR	PICTURE
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
YEAR	Year	dddd
NUMFFDAY	Number of Frost-Free Days	ddd.dd
DEGDAY	Degree Days (5.5 deg. Base Temp.)	dddddd.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	ddd.dd
TJANRNFL	Total January Rainfall	ddd.dd
TFEBRNFL	Total February Rainfall	ddd.dd
TMARRNFL	Total March Rainfall	ddd.dd
TAPRRNFL	Total April Rainfall	ddd.dd
TMAYRNFL	Total May Rainfall	ddd.dd
TJUNRNFL	Total June Rainfall	ddd.dd
TJULRNFL	Total July Rainfall	ddd.dd
TAUGRNFL	Total August Rainfall	ddd.dd
TSEPRNFL	Total September Rainfall	ddd.dd
TOCTRNFL	Total October Rainfall	ddd.dd
TNOVRNFL	Total November Rainfall	ddd.dd
TDECRNFL	Total December Rainfall	ddd.dd

FILE NAMES: TESTDESN.ITB TESTDESN.IPF
 FILE DESCRIPTION: Test Design
 FILE NUMBER: 12

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
NELDER	Nelder (X or blank)	r
CONTIG	Contiguous (X or blank)	r
NONCONTG	Non-contiguous (X or blank)	r
BUFFROWS	Buffer Rows (e.g. 2 or 2x3)	rrrrr
CONTINVP	Continuous Inventory Plots (X or blank)	r
DESTRSP	Destructive Sample Plots (X or blank)	r
PLOT	Plot (select one)	8r
	a) row	
	b) block	
	c) single	
RANDOM	Randomization (select one)	20r
	a) complete	
	b) block	
	c) latin square	
	d) incomplete block	
	e) interlocking block	
	f) lattice	
	g) other (describe)	

FILE NAMES: TESTVARS.ITB TESTVARS.IPF
 FILE DESCRIPTION: Test Variables
 FILE NUMBER: 13

DATA ITEM	DESCRIPTOR	PICTURE
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
	Give Number of Each Variable Evaluated (1=held constant, 0=not relevant)	
SPECIES	Species	dd
PROVNC	Provenances	dd
STANDS	Stands	dd
FAMILIES	Families	ddd
CLONES	Clones	ddd
ESTBMTHD	Establishment Methods	dd
FERTILTY	Fertility Levels	dd
IRRIGATN	Irrigation Levels	dd
CULTVATN	Cultivation Levels or Types	dd
WSTWATER	Wastewater Levels	dd
HERBICID	Herbicide Types	dd
SPACING	Spacing (tree densities)	dd
ROTATION	Rotation Lengths	dd
HARVMTHD	Harvest Methods	dd
HARVDATE	Harvest Dates	dd
N2FXPATN	Interplant of N2 Fixers (# patterns)	dd
N2FXSPEC	Interplant of N2 Fixers (# species)	dd

FILE NAMES: TRTSIZSP.ITB TRTSIZSP.IPF
 FILE DESCRIPTION: Treatment Size/Spacing
 FILE NUMBER: 14

DATA ITEM	DESCRIPTOR	PICTURE
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
YEARPLTD	Year Planted	dddd
MNTHPLTD	Month Planted (abbreviated)	3r
TESTAREA	Total Area Planted for Test (ha)	dddd.dd
BLOCAREA	Area of Each Block Replicate (within test)	dddd.dd
TRTAREA	Area Per Treatment Plot (ha)	dddddd.dd
NUMREPLS	# Replicates	dddddd
TTREEREP	#Total Trees/Replicate	dddd
FAMPROV	#Families/Provenance	dddd
TFAMREP	#Trees/Family	dddd
TCLONREP	#Clones/Rep	dddd
RAMTCLON	#Ramets/Clone	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

FILE NAMES: SITEPREP.ITB SITEPREP.IPF
 FILE DESCRIPTION: Site Preparation
 FILE NUMBER: 15

DATA ITEM	DESCRIPTOR	PICTURE
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CULTVATD	Cultivation (type)	12r
STUMPRMV	Stump Removal (X or blank)	3r
HERBUSED	Herbicides Used "	3r
BEDDING	Bedding "	3r
WINDROWD	Windrowed "	3r
SLASHCHP	Slash Chopping "	3r
BURN	Burn "	3r
PLNTMTHD	Planting Method a) Hand Planted b) Machine Planted	10r
FERTZN	Fertilization (X or blank)	3r
BANDMLCH	Band Mulching "	3r
IRRIGATN	Irrigation "	3r
SEEDSOAK	Seedlings Soaked/Dipped "	3r

FILE NAMES: TRTPS1.ITB TRTPS1.IPF
 FILE DESCRIPTION: Treatment Planting Stock Source
 FILE NUMBER: 16

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
SPECIES	Genus and Species or Hybrid Codes	8r
COLLRNG	Collection Range for Provenance Tests	20r
MTRLSRC	Material Source for Yield Tests	40r
BULKPROV	Bulk Provenance (X or blank)	3r
BULKSTND	Bulk Stand "	3r
HALFSIB	Half-Sib "	3r
FULLSIB	Full-Sib "	3r
IDCLONES	Identified Clones "	3r
MXCLONES	Mixed Clones "	3r

FILE NAMES: TRTPS3.ITB TRTPS3.IPF
 FILE DESCRIPTION: Treatment Planting Stock Quality
 FILE NUMBER: 17

DATA ITEM	DESCRIPTOR	PICTURE
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
PLNTMATL	Planting Material (select one)	25r
	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	
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, med, poor)	4r

FILE NAMES: YRMNTRT1.ITB YRMNTRT1.IPF
 FILE DESCRIPTION: Yearly Maintenance by Treatment
 FILE NUMBER: 18

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

FILE NAMES: YRMNTHB.ITB YRMNTHB.IPF
 FILE DESCRIPTION: Yearly Maintenance (Herbicides)
 FILE NUMBER: 19

DATA ITEM	DESCRIPTOR	PICTURE
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
HBMONTH	Month Applied	3r
HERBNAME	Herbicide Name	8r
HERBTYPER	General Type	8r
HBAPPLRT	Application Rate	dddd.dd
HBAPPLMD	Application Method	8r
HBESTCST	Estimated Cost per Hectare	\$dddd.dd
HBEFTV	Effectiveness (G=good, F=fair, P=poor) (for weed control)	r
HBEFCTRE	Effect on Trees (NO=no negative effect, SL=slight negative effect, UN=undetermined)	rr

FILE NAMES: YRMNTFT.ITB YRMNTFT.IPF
 FILE DESCRIPTION: Yearly Maintenance (Fertilizer)
 FILE NUMBER: 20

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
FTMONTH	Month Applied	3r
FTN	%N	dd.d
FTP	%P	dd.d
FTK	%K	dd.d
FTAPPLMD	Application Method	8r
FTAMT	Total Amount (kg/ha)	dddd.dd
FTEFFECT	Soil Fertility Effect (improved, maintained degraded, undetermined)	12r

FILE NAMES: YRMNTPC.ITB YRMNTPC.IPF
 FILE DESCRIPTION: Yearly Maintenance (Pest Controls)
 FILE NUMBER: 21

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
PCMONTH	Month Applied	3r
PCCTLSUB	Control Substance	20r
PCEFTV	Effectiveness (G=good,F=fair,P=poor)	6r
PCAPPLMD	Application Method	40r

FILE NAMES: YRMNTCT.ITB YRMNTCT.IPF
 FILE DESCRIPTION: Yearly Maintenance (Cultivation)
 FILE NUMBER: 22

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
CTMONTH	Month	3r
CTMETHOD	Method	20r
CTEFTV	Effectiveness for weed control (G=good,F=fair,P=poor)	6r

FILE NAMES: YRMNTMW.ITB YRMNTMW.IPF
 FILE DESCRIPTION: Yearly Maintenance (Mowing)
 FILE NUMBER: 23

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
MWMONTH	Month	3r
MWEQUIP	Equipment	20r
MWEFTV	Effectiveness for weed control (G=good, F=fair, P=poor)	6r

FILE NAMES: YRMNTBC.ITB YRMNTBC.IPF
 FILE DESCRIPTION: Yearly Maintenance (Browsing Control)
 FILE NUMBER: 24

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
BCMETHOD	Method	20r
BCEFTV	Effectiveness (G=good, F=fair, P=poor)	6r

FILE NAMES: YRMNTIR.ITB YRMNTIR.IPF
 FILE DESCRIPTION: Yearly Maintenance (Irrigation)
 FILE NUMBER: 25

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
IRGNMTHD	Irrigation Method (select one)	d
	1) spray	
	2) drip	
	3) other	
IRGNWS	Irrigation Water Source (select one)	d
	1) river/lake/pond water	
	2) well water	
	3) waste water	
	4) other	
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)	r

FILE NAMES: YRMNTLM.ITB YRMNTLM.IPF
 FILE DESCRIPTION: Yearly Maintenance (Liming)
 FILE NUMBER: 26

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
LMMONTH	Month Applied	3r
LMAPPLMD	Application Method	40r
LMAMT	Total Amount (kg/ha)	dddd.dd
LMEFFECT	Soil Fertility Effect (improved, maintained degraded, undetermined)	12r

FILE NAMES: YRMSMTN1.ITB YRMSMTN1.IPF
 FILE DESCRIPTION: Yearly Measurement Information
 FILE NUMBER: 27

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
HGTDATA	Height Data (yes or no)	3r
DBH	Breast Diameter Data (yes or no)	3r
DIAMBASE	Base Diameter Data (yes or no)	3r
MEASMNTH	Month Collected	3r
MEASREPN	Number of Replicates Measured	dddd
MEASTREN	Number Trees/Rep Measured	dddd
MEASSPRT	Percent Sprouts/Tree Measured	ddd.dd

FILE NAMES: YRHARVIN.ITB YRHARVIN.IPF
 FILE DESCRIPTION: Yearly Harvest Information
 FILE NUMBER: 28

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
WETWGT	Wet Weight (yes or no)	3r
TOTREPHV	Total Replicate Harvested (yes or no)	3r
REPSUBHV	Replicate Subplot Harvested (yes or no)	3r
NUMREPHV	Number of Replicates Harvested	dddd
NUMTREHV	Number Trees/Rep 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
REFRPTPG	Reference Report and Page	40r

FILE NAMES: YRHARVMD.ITB YRHARVMD.IPF
 FILE DESCRIPTION: Yearly Harvest Methods
 FILE NUMBER: 29

DATA ITEM	DESCRIPTOR	PICTURE
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
MONTH	Month	3r
CUTMTHD	Method of Cut (select one)	15r
	1. manual (chain saw, brush cutter)	
	2. mechanical (but individual trees)	
	3. prototype (multiple tree harvester)	
	4. commercial (multiple tree harvester)	
	5. other	
RMVMTHD	Method of Removal (select one)	15r
	1. manual skidding	
	2. grapple skidder	
	3. other	
AVGSTHGT	Average Stump Height (cm)	ddd
AVGSTANG	Average Stump Angle (degrees)	dd
AVGSTDIA	Average Stump Diameter (cm)	ddd
PTSTPDMG	Percent Stumps Damaged	%dd.dd

FILE NAMES: YRYLDTST.ITB YRYLDTST.IPF
 FILE DESCRIPTION: Yearly Biomass Yields Per Test
 FILE NUMBER: 30

DATA ITEM	DESCRIPTOR	PICTURE
-----	-----	-----
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
SELECSRV	Percent Survival of Select Provenances, Conditions etc.	ddd.dd
SELECYLD	Biomass Yield (Mg/ha) of Select Group	dddddd.dd
SELYLSD	Standard Deviation (mg/ha) Between Reps of Select Group	dddddd.dd
ALLSRV	Percent Survival of All Provenances, Conditions etc.	ddd.dd
ALLYLD	Biomass Yield (Mg/ha) of All Provenances, Conditions in Test	dddddd.dd
ALLYLSD	Standard Deviation (Mg/ha) Between Reps Including All Groups	dddddd.dd
CONTRYLD	Biomass Yield (Mg/ha) of Control	dddddd.dd
SELECTGP	Please describe select group	60r
CONTROL	Please describe control data	60r

FILE NAMES: YRYLDTRT.ITB YRYLDTRT.IPF
 FILE DESCRIPTION: Yearly Biomass Yields Per Treatment
 FILE NUMBER: 31

DATA ITEM	DESCRIPTOR	PICTURE
SUBNUM	Subcontract or Grant Number	8r
KEYNAME	Key Name	8r
SITE	Site Code	8r
TESTNAME	Test Code	8r
TREATMNT	Treatment Code	8r
CALENYR	Calendar Year	dddd
GROWTHYR	Growth Year	dd.dd
ROTATION	Rotation	dd
PCTSURV	Percent Survival	%ddd.dd
BIOYIELD	Biomass Yield (Mg/ha)	dddddd.dd
STDDEV	Standard Deviation (Mg/ha)	dddd.dd
MOISTURE	Moisture Content	ddd.dd
SPECGRAV	Specific Gravity	dddd.dd
	Reasons for Lower-Than-Expected Yield (select any that apply, mark with an X)	
OFFSITE	1. species off-site	3r
DROUGHT	2. drought	3r
FLOODING	3. flooding	3r
POORSTOK	4. poor quality planting stock	3r
POORSITE	5. poor site preparation	3r
WEEDCOMP	6. weed competition	3r
INSECTS	7. insect pests	3r
DISEASE	8. disease problems	3r
BROWZE	9. animal browse	3r
OTHERPRB	10. other	60r

SECTION 4.0 USER GUIDE

The SRWCP computer system is designed to be used with only minimal knowledge of computers and to be friendly. Menus and prompts are displayed to allow the user to perform complex tasks and queries with only one or two keystrokes. The menu and prompt sequence is a tree structure. This allows different tasks to be performed at different levels in the data base, with the option of a task suspension or a return to a previous menu at any time.

4.1 SYSTEM START UP

If the SRWCP computer system power is 'off' then turning the power switch 'on' will start the computer. Once the power has been turned on the computer will initialize itself and display a screen such as that in Fig. 2. The computer can also be started by hitting the 'control', 'alt', and 'delete' keys simultaneously if the power is already on. Instructions are provided on the screen for entering the SRWCP Data Management System. The SRWCP Data Management System is entered by typing 'BIOMASS' at the '>' prompt. A valid user name and password are then requested. The appropriate user name is 'DMSUSER' and the password is '256'. Some file initialization will then occur and a message will be sent to the screen to indicate that the initialization is in progress. Once the initialization is complete, the initial control menu is displayed as shown in Fig. 3. The user can then browse through the data base and modify data, add data to the data base, generate reports, perform ad hoc queries, or exit to the IBM Disk Operating System.

```
D>ECHO OFF
D>REM ***** Type "BIOMASS" after the prompt to enter the **
D>REM ***** SRWCP Data Base Management System.          **
D>
```

Figure 2

SRWCP Data Base Initial Screen

SRWCP DATA BASE
INTERACTIVE QUERY SYSTEM

BROWSE THROUGH THE SRWCP DATA BASE.....1
INPUT DATA INTO THE SRWCP DATA BASE.....2
EXTRACT DATA OR REPORT FROM SRWCP DATA BASE....3
ENTER KNOWLEDGEMAN TO PERFORM CUSTOM QUERY.....4
EXIT SYSTEM AND RETURN TO DOS.....5

Please Select Function _

Figure 3
SRWCP Data Base Initial Control Menu

4.2 BROWSING THE DATA BASE

The data base can be browsed and modified by inputting a '1' in the initial control menu. A menu of the files in the data base will be displayed as in Fig. 4 and the number of the file to be modified should be entered. Once the file number has been entered, the data values in the first record of the file are displayed. The data values can be modified or subsequent records can be displayed for modification. Hitting the "return" key will move the cursor to the next field in the record. If the cursor is resting at the top of the screen the "ctl-f" key will cause the next record in the file to be displayed. Similarly, the "ctl-a" key will cause the previous record in the file to be displayed. If the cursor is resting in one of the fields of the record, the "ctl-f" key will move the cursor to the next field position and the "ctl-a" key will move the cursor to the previous field position. When you have modified all of the data values in the file that you wish to modify, hit the 'escape' key. You will then be asked if you wish to continue modifying data values. If you respond with, 'Yes', the next file in the data base will be presented for your modification and you can modify data values in that file using the above procedure. If you wish to end your browsing and modifying session, then you should enter 'No.' You will then return to the menu as in Fig. 4. At this time you can input another file number to modify another file or you can enter '0' to stop the session and return to the initial control menu.

SRWCP DATA BASE
DATA FILES

Project Identification.....1	Trtmt. Planting Stock Quality.17
Primary Investigator.....2	Yearly Maintenance/Trtmt.....18
Project Title and Pblctns.....3	Yearly Maintenance (Herb.)....19
Project Type of Research.....4	Yearly Maintenance (Fert.)....20
Site Location.....5	Yearly Maintenance (Pst Ctl)..21
Site Average Climate.....6	Yearly Maintenance (Cult.)....22
Site Quality.....7	Yearly Maintenance (Mowing)...23
Soil Chemistry.....8	Yearly Maintenance (Brs Ctl)..24
Soil Physics.....9	Yearly Maintenance (Irrgtn)...25
Site Type.....10	Yearly Maintenance (Liming)...26
Yearly Rainfall/Temp. Data...11	Yearly Measurement Info.....27
Test Design.....12	Yearly Harvest Information....28
Test Variables.....13	Yearly Harvest Methods.....29
Treatment Size/Spacing.....14	Yearly Biomass Yields/Test...30
Site Preparation.....15	Yearly Biomass Yields/Trtmt...31
Trtmt. Planting Stock Source.16	

Please Select Data File to Browse/Update or 0 to Stop __

Figure 4

SRWCP Data Base File Menu

4.3 ADDING DATA TO THE DATA BASE

Data can be added to the data base by inputting option '2' in the initial control menu (Fig. 3). A menu of the files in the data base will be presented as in Fig. 4. The number of the file for which data are to be added should be entered. A template of the file will be displayed on the screen and data values for a new data record can be input into the template. Once the data values for a new record have been input, the template will be refreshed to allow for data values of another record to be input. Once all of the new data records have been input, the 'escape' key should be struck. You will then be asked if you wish to continue updating data files. If you respond with, 'Yes', then the next file in the data base will be presented for you to input new data values in that file as you did before. If you wish to end your updating session, then you should enter, 'No'. You will then return to the menu as in Fig. 4. At this time you can input another file number, to add data to another file, or you can enter '0', to stop the session and return to the initial control menu as in Fig. 3.

Refer to Sect. 4.2 for a discussion of the control keys that can be used to navigate through fields on the template. The backspace key can be used to correct typing errors within a field. If data are partially input in the record and the user wishes to quit without saving the data partially input into the record, then the 'escape' key should be struck. This will allow the update session to be exited without saving the record. The data values input in the template are stored in the file when the 'return' key is struck

after the last field in the template has been filled. The file may be exited, without saving the data input in that record, at any time before this.

4.4 GENERATING REPORTS

Standard reports can be generated by inputting option '3' in the initial control menu (Fig. 3). A menu of the standard reports will be presented as in Fig. 5. The number of the desired report should be entered.

A message indicating that the report is being generated will be sent to the screen and the report will subsequently be output to the printer. The report could take from 3 to 20 minutes to be generated, depending on its complexity. Once the report is printed, you will be asked if you wish to continue. If you answer, 'Yes', the menu of standard reports (Fig. 5) will be displayed and you can again select a report to be generated. If you answer, 'No', then you are returned to the initial control menu (Fig. 3).

4.5 AD HOC COMMANDS

While the SRWCP Data Management System is very powerful, not all functions can be performed under its direction. To this end, the KNOWLEDGEMAN environment can be entered and ad hoc and custom functions can be performed by inputting option '4' in the initial control menu. All of the KNOWLEDGEMAN functions can be performed in this environment. Refer to the 'KNOWLEDGEMAN Technical Reference Manual' to become familiar with all of the functions available. The SRWCP Data Management System can be reentered from the KNOWLEDGEMAN environment by typing the command 'PERFORM "STARTUP.IPF".'

SRWCP DATA BASE REPORTS

Report A - Number of Projects and Sites per Species.....	1
Report B - Number of Species and Sites per Project.....	2
Report C - Yields by Project and Species.....	3
Report D - Yields by Site Quality, Species, and State.....	4
Report E - Yields by Irrgn. Level, Site Qual., Species, & Project..	5
Report F - Yields by Site Qual., State, and Species w/ Fertilizer.	6
Report G - Treatment Yield of Species by Region.....	7
Report H - Critical Parameters Sorted by Species.....	8
Report I - Critical Parameters Sorted by Age.....	9
Report J - Critical Parameters Sorted by Spacing.....	10
Report K - Herbicide Effectiveness.....	11
Report L - Factors Affecting First Year Survival.....	12

Please Select Report to be Printed or 0 to Stop: ___

Figure 5

SRWCP Data Base Report Menu

Some functions which may be particularly useful are described below.

4.5.1 Deleting Records

Records in any of the files of the SRWCP data base can be deleted. The record to be deleted must be marked and then the file must be compressed. For instance, suppose that the third record in the PROJID file was to be deleted. To mark the third record, type the command:

```
_MARK RECORD IN PROJID WITH TRUE RANGE 3,3
```

Next, the file would be compressed by typing the command:

```
_COMPRESS PROJID.
```

This two-step procedure would delete the third record in the PROJID file. Refer to the 'KNOWLEDGEMAN Technical Reference Manual' for more information on the MARK and COMPRESS commands.

4.5.2 Changing Field Values in a File

Sometimes, the value of a field in all of the records of an SRWCP file will need to be changed. The CHANGE command can be used to accomplish this. Suppose the subcontract number, SUBNUM, in the PROJID file was to be changed from 12X45D to 12X37A. The command to initiate this change is

```
_CHANGE SUBNUM IN PROJID TO "12X37A" FOR PROJID="12X45D"
```

SUBNUM would now have the value "12X37A" in all of the records in the file where it had the value "12X45D". Refer to the 'KNOWLEDGEMAN Technical Reference Manual' for more information on the change command.

4.6 EXITING THE SYSTEM

The SRWCP Data Management System can be exited by inputting option '5' of the initial control menu. The data base will be closed and the Disk Operating System environment will be entered. The SRWCP Data Management System can be reentered by performing the steps given in Sect. 4.1.

4.7 BACKING UP THE DATA BASE

The SRWCP data base should be backed up periodically - every two weeks during normal operations. The data in the data base can be backed up to floppy diskettes by performing the DOS BACKUP command. The DOS environment can be entered by exiting the system as outlined in Sect. 4.6. The DOS environment is the initial environment the computer is in when the system is powered on or booted. The DOS environment is identified by the 'D>' prompt on the screen. The following command should be typed after the prompt to backup the data in the SRWCP data base:

```
D>BACKUP D:\SRWCPDAT A:
```

You will be asked to insert a diskette into drive A. Insert those diskettes labelled as back-ups in the order specified on their labels. The back-up will require four or more diskettes. Insert the back-up diskette that is labelled number 1 and press "return". When the back-up fills the first diskette, it will ask you to insert the next diskette. Insert diskette 2 and press "return". Do this with diskette 3 and so on until the back-up indicates that it is complete. If another diskette is requested after the last available back-up diskette has been filled, insert a formatted diskette that does not contain any important information. The diskette will be

erased before the back-up to the diskette occurs. Continue to insert formatted diskettes until the back-up is complete.

SECTION 5.0 DATA MANAGEMENT SOFTWARE

The software written to manage the SRWCP subcontract data-base consists of a collection of procedures written in the KNOWLEDGEMAN data base management syntax. These procedures control the input and modification of subcontract data and produce several different reports on the data in the SRWCP data base. The data management software provides a level of insulation between the user and KNOWLEDGEMAN itself. This promotes data integrity, data control, security, and user-friendliness. It further provides a mechanism whereby a user can interact with a data base that consists of 31 distinct data files and 300 distinct data items in an orderly, controlled, prompted fashion. Each of the procedures is discussed in the following sections. A physical system description of the data management software is provided in Fig. 6. The reader is referred to DeMarco (1979) for a discussion on physical system descriptions. The description provides a composite picture of the flow of data through the data management system and the processes (procedures) that operate on the data. A structure chart of the data management software is provided in Fig. 7. This chart shows the relationships between the major functions and procedures of the data management software.

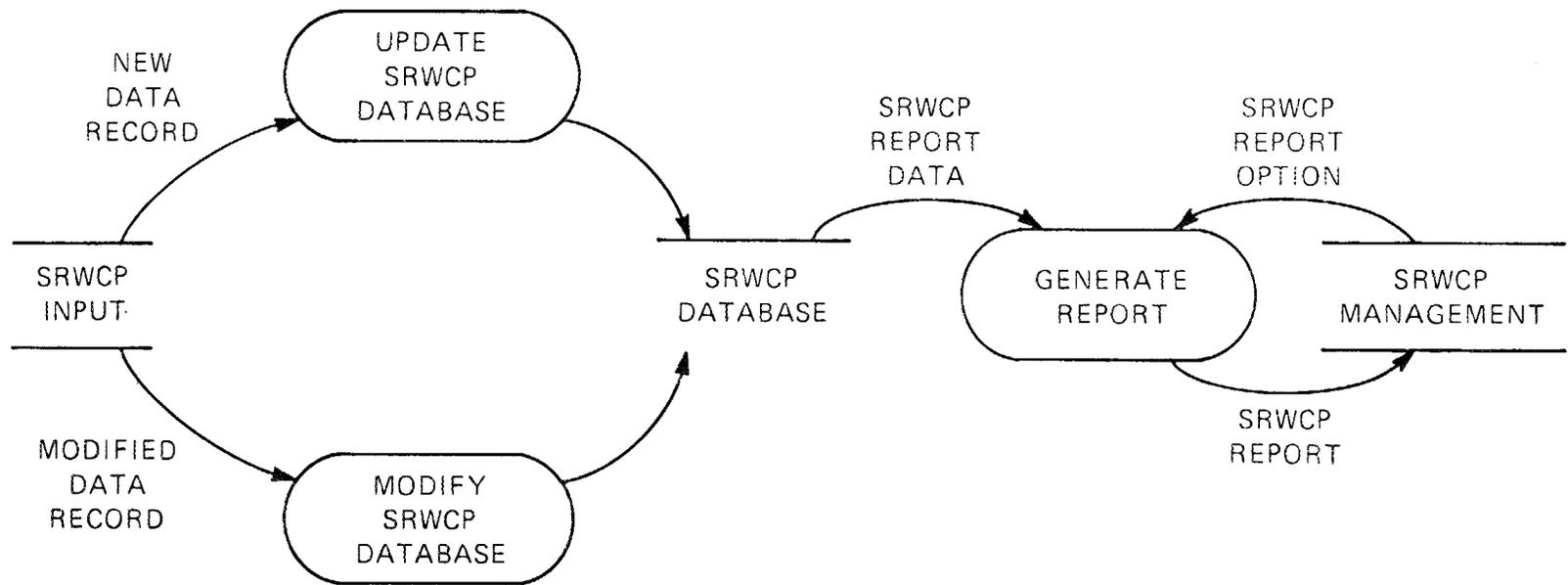


Figure 6. SRWCP Database Physical System Description.

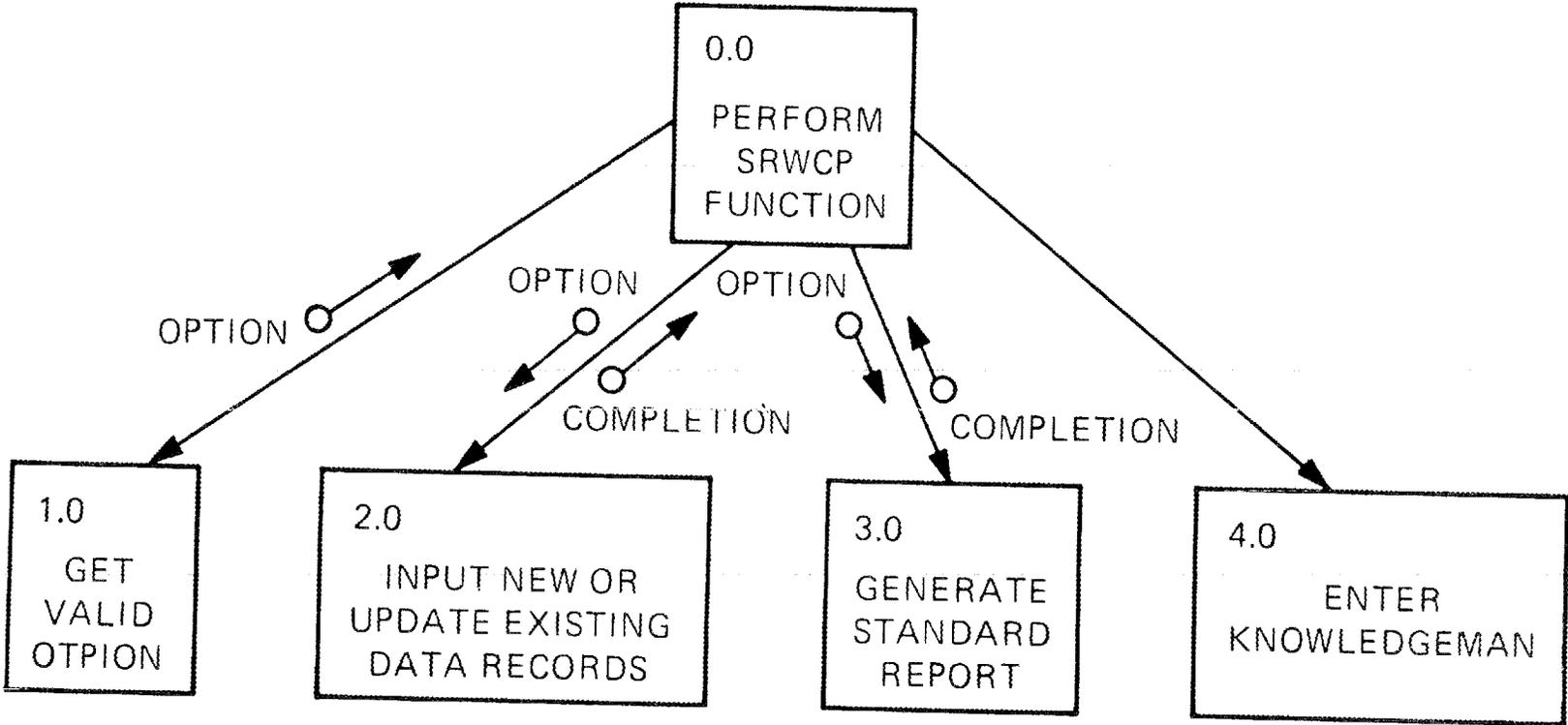


Figure 7. SRWCP Database Structure Chart.

5.1 DATA BASE CONTROL PROCEDURE

A control procedure was written in the KNOWLEDGEMAN procedure language to act as an intermediary between the KNOWLEDGEMAN system and the user of the SRWCP Data Management System. This approach was designed to customize the KNOWLEDGEMAN DBMS to the requirements of the SRWCP and at the same time provide a more user-friendly and controlled environment. A pseudo-code description of the control procedure is provided in Fig. 8. The reader should refer to DeMarco (1979) for a complete discussion on pseudo-code descriptions. The control procedure's name is STARTUP.IPF. This procedure is automatically executed by KNOWLEDGEMAN upon startup of the data management system. The procedure displays a screen from which one of five options can be selected. The options are to browse through the data base, input new data into the data base, output a standard report, enter the KNOWLEDGEMAN environment for ad hoc query, and exit KNOWLEDGEMAN and enter the DOS environment. The control procedure evaluates the selection made and initiates the appropriate procedure to perform the requested function.

```
LET FOREVER = TRUE
DO (FOREVER)
  GET VALID OPTION
  IF OPTION_SELECTED_BY_USER = 4 THEN STOP
  IF OPTION_SELECTED_BY_USER = 5 THEN BYE
  ELSE PERFORM PROCEDURE(OPTION_SELECTED_BY_USER)
END
```

Figure 8

Control Procedure Pseudo-code Description*

* Refer to Section 5.5 for variable definitions.

5.2 DATA BASE BROWSE/MODIFY PROCEDURE

If a user elects to browse through the SRWCP data base by selecting Option 1 in the control procedure, the MODIFY procedure is initiated. The first thing this procedure does is refresh the screen and display a menu of all the files in the SRWCP data base. The user then has the option of selecting the file that is to be browsed or electing to quit and return to the main menu of the control procedure. Once a file is selected, this procedure initiates the KNOWLEDGEMAN "Browse" command under program control. This allows the user to view the contents of SRWCP data items and modify them as necessary. A pseudo-code description of this procedure is provided in Fig. 9. The procedure resides in the file BRCRPROC.IPF.

```
DO UNTIL USER_WANTS_TO_STOP
  WRITE FILE_OPTION_MENU TO SCREEN
  READ FILE_INPUT_BY_USER FROM SCREEN
  OPEN FILE_INPUT_BY_USER
  LET CURRENT_RECORD=1
  DO UNTIL ESCAPE_BY_USER
    WRITE CURRENT_RECORD_DATA TO SCREEN
    IF CURRENT_RECORD_DATA IS RECORD_TO_BE_MODIFIED
      READ NEW_DATA_FROM_SCREEN
      WRITE NEW_DATA_FROM_SCREEN TO CURRENT_RECORD
    ELSE
      LET CURRENT_RECORD = NEXT_RECORD
    END
  END
END
GET NEXT FILE
END
```

Figure 9

Modify Procedure Pseudo-Code Description*

* Refer to SECTION 5.5 for variable definitions.

5.3 DATA BASE UPDATE PROCEDURE

If a user elects to input new data into the data base by selecting Option 2 of the main menu in the control procedure, the UPDATE procedure is initiated. Like the modify procedure, this procedure refreshes the screen and displays a menu of the files in the data base. The user then selects the file for which new data are to be input or the user elects to return to the main menu of the control procedure. A template containing fields where the new data items can be input is displayed. The user enters data as long as he/she, desires with the procedure continually refreshing the template after each record of data is input. This procedure accomplishes this task by executing the KNOWLEDGEMAN "create" command under program control. This procedure is contained physically within the same procedure file BRCCRPROC.IPF of Option 1. The pseudo-code description of this file is provided in Fig. 10.

```
DO UNTIL USER_WANTS_TO_STOP
  WRITE FILE_OPTION_MENU TO SCREEN
  READ FILE_INPUT_BY_USER FROM SCREEN
  OPEN FILE_INPUT_BY_USER
  COMPUTE NEXT_AVAILABLE_RECORD_#
  DO UNTIL ESCAPE_BY_USER
    WRITE TEMPLATE OF FILE_INPUT_BY_USER TO SCREEN
    READ DATA_FOR_FILE_FROM_SCREEN
    WRITE DATA_FOR_FILE_FROM_SCREEN TO
      NEXT_AVAILABLE_RECORD_#
    INCREMENT NEXT_AVAILABLE_RECORD_#
  END
  GET NEXT FILE
END
END
GET NEXT FILE
END
```

Figure 10

Update Procedure Pseudo-code Description

* Refer to SECTION 5.5 for variable definitions.

5.4 REPORT GENERATION PROCEDURE

If the user elects to have a standard report produced by selecting Option 3 of the control procedure, this procedure is initiated. The first thing this procedure does is refresh the screen and present a template of the titles of the standard reports for which output can be requested. The user then selects the report that is desired or the option to return to the control procedure main menu. The procedure performs the KNOWLEDGEMAN "Print" command on the appropriate report procedure file under program control. The name of the file in which this procedure resides is "SPECLRPT.IPF". One report procedure file exists for each different report option. These individual procedure files select the appropriate data from the data base and format them. A print command file corresponding to each print procedure file is used to output the report. A pseudo-code description of the main report generation procedure is presented in Fig. 11.

```
DO UNTIL USER_WANTS_TO_STOP
  WRITE REPORT_OPTION_MENU TO SCREEN
  READ REPORT_OPTION FROM SCREEN
  RETRIEVE DATA_NEEDED_FOR_REPORT
  PRINT DATA_NEEDED_FOR_REPORT
END
```

Figure 11

Report Generation Procedure Pseudo-Code Description

* Refer to SECTION 5.5 for variable definitions.

5.5 DATA DICTIONARY

The data dictionary presented below provides definitions of data items used in procedure pseudo-code descriptions. For a more complete discussion on data dictionaries the reader is referred to DeMarco (1979).

ELEMENT -----	DEFINITION -----
BYE	* Exit from SRWCP and KNOWLEDGEMAN DBMS processing.
CURRENT_RECORD	* Current record number of data items in FILE_INPUT_BY_USER.
CURRENT_RECORD_DATA	* The data item values of CURRENT_RECORD in FILE_INPUT_BY_USER.
DATA_FOR_FILE_FROM_SCREEN	* The data input to the TEMPLATE.
DATA_NEEDED_FOR_REPORT	* The data in the SRWCP data base needed by the report specified by REPORT_OPTION.
ESCAPE_BY_USER	* Escape key hit by user to indicate completion of request.
FILE	* The next logical file in the data base after FILE_INPUT_BY_USER.
FILE_INPUT_BY_USER	* Identifier of the file to be updated or modified.
FOREVER	* Flag indicating that DO loop is to be performed until STOP or BYE.
NEW_DATA_FROM_SCREEN	* New data item values read from the CURRENT_RECORD_DATA.
NEXT_AVAILABLE_RECORD_#	* Number of the next available record at which data can be stored.
NEXT_RECORD	* CURRENT_RECORD + 1.
RECORD_TO_BE_MODIFIED	* Record number of data in FILE_INPUT_BY_USER to be modified.
REPORT_OPTION	* An identifier used to select one of 12 reports in REPORT_OPTION_MENU.

REPORT_OPTION_MENU	* A template of reports from which any report can be selected to be printed.
STOP	* Enter the KNOWLEDGEMAN command language.
TEMPLATE	* A presentation of the data items in FILE_INPUT_BY_USER in which data can be input.
USER_WANTS_TO_STOP	* Yes/No indicator used to determine if the next sequential file is to be processed.

FLOW

DEFINITION

New Data Record	* A record of new values for one of the 31 files in the SRWCP data base.
Modified Data Record	* A record of modified values for one of the 31 files in the SRWCP data base.
SRWCP Report Data	* A collection of related values from the SRWCP data base required to generate the requested report.
SRWCP Report Option	* A selection of one of the available reports that can be generated by the SRWCP report generator.
SRWCP Report	* A meaningful representation of the data requested.

FILES

DEFINITION

SRWCP Data Base	* The relational data base containing the SRWCP subcontract information.
-----------------	--

COUPLES

DEFINITION

OPTION	* OPTION_SELECTED_BY_USER
COMPLETION	* Flag indicating that the user request has been completed.

5.6 AD HOC QUERY

The KNOWLEDGEMAN command level can be entered from within the SRWCP data management system by selecting Option 4 of the control procedure menu. Once this option is input, the user leaves the controlled environment of the SRWCP Data Management System and enters the basic command level of KNOWLEDGEMAN. At this level, the user can perform any valid KNOWLEDGEMAN command. This is desirable for performing one-shot and ad hoc queries on the SRWCP data or other, unrelated data. SRWCP data base change procedures and record deletions can be performed in this environment. Refer to the KNOWLEDGEMAN reference manual for a description of the allowable commands. Text editing, spreadsheet, and graphics capabilities can be realized through the command level. If the user desires to re-enter the SRWCP data management system at the command level, the following command should be input at the prompt:

```
_PERFORM "D:STARTUP.IPF"
```

A period of initialization will take place, then the SRWCP control procedure main menu will be displayed. At this time, the user is once again within the SRWCP data management software.

5.7 SRWCP REPORT LAYOUTS

In this section are examples of each of the reports that can be produced in the SRWCP report generation procedure. The report titles, headings, and actual variables required to fill the columns of the reports are presented. In addition, the sorting order of variables comprising the data columns is presented.

Report A Number of Projects and Sites per Species
mm/dd/yy

Species -----	Institution -----	Sites Planted -----
Species 1	Institut 1	Site 1 Site 2
		.
		.
Species N	Institut N	Site 1 Site 2 Site 3

Sorted by Species, Institution, and Site

Report B Number of Species and Sites per Project

mm/dd/yy

Institution	Species	Sites Planted
-----	-----	-----
Institut 1	Species 1	Site 1
		Site 2
		.
		.
Institut N	Species N	Site 1
		Site 2
		Site 3

Sorted by Institution, Species, and Site

Report C

Yields by Project and Species

mm/dd/yy

<u>Institution</u>	<u>Species</u>	<u>Year</u>	<u>Mean Annual Yield</u>
Institut 1	Species 1	Calenyr 1	Bioyield 1 Bioyield 2
Institut N	Species N	Calenyr N	Bioyield 1 Bioyield 2 Bioyield 3

Sorted by Institution, Species, Age, and Yield

Report D Yields by Site Quality, Species, and State

mm/dd/yy

State Yield	Species	Site Quality	Rotation	Age	Mean Annual
-----	-----	-----	-----	---	-----
State 1	Species 1	Sitequal 1	Rotation 1	Growthyr 1	Bioyield 1 Bioyield 2
State N	Species N	Sitequal N	Rotation N	Growthyr N	Bioyield 1 Bioyield 2 Bioyield 3

Sorted by State, Species, Site Quality, Rotation,
Age, and Yield

Report E Yields by Irrigation Level, Site Quality,
Species, and Project

mm/dd/yy

<u>Institution</u>	<u>Species</u>	<u>Site Quality</u>	<u>Irrig.Level</u>	<u>Yield</u>
Institut 1	Species 1	Sitequal 1	Amtwater 1	Bioyield 1 Bioyield 2
Institut N	Species N	Sitequal N	Amtwater N	Bioyield 1 Bioyield 2 Bioyield 3

Sorted by Institution, Species, Site Quality, and
Irrigation Level

Report F Yields by Site Quality, State, and Species with
Fertilizer Level Indicated

mm/dd/yy

Species Fertilizer	State	Site Quality	Rotation	Age	Yield
-----	-----	-----	-----	---	-----
Species 1 1 Ftamt 1	State 1	Sitequal 1	Rotation 1	Growthyr 1	Bioyield
2 Ftamt 2					Bioyield
Species N 1 Ftamt 1	State N	Sitequal N	Rotation N	Growthyr N	Bioyield
2 Ftamt 2					Bioyield
3 Ftamt 3					Bioyield

Sorted by Species, State, Age, Yield

Report G Treatment Yield of Species by Region
 mm/dd/yy

Region Yield	State	Species	Test Size	Treatment	Rotation	Age
-----	-----	-----	-----	-----	-----	---
Region1 Bioyield1	State1	Species1	Testarea1	Treatmnt1	Rotation1	Growthyr1
Bioyield2				Treatmnt2		
RegionN Bioyield1	StateN	SpeciesN	TestareaN	Treatmnt1	RotationN	GrowthyrN
Bioyield2				Treatmnt2		
Bioyield3				Treatmnt3		

Sorted by Region, State, Genus, Test Size, and Yield

Report H

Critical Parameters Sorted by Species

mm/dd/yy

Institut. Age	State Yield	County #Trees	Site	Test	Treatment	Species	Rotation
-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----

Institut1 Growthyr1	State1 Bioyield1	County1 #Trees	Site1	Test1	Treatment1	Species1	Rotation1
------------------------	---------------------	-------------------	-------	-------	------------	----------	-----------

InstitutN GrowthyrN	StateN BioyieldN	CountyN #TreesN	SiteN	TestN	TreatmentN	SpeciesN	RotationN
------------------------	---------------------	--------------------	-------	-------	------------	----------	-----------

Sorted by Genus, Species, and # of Trees

Report I

Critical Parameters Sorted by Age

mm/dd/yy

Instit. Age	State Yield	County #Trees	Site	Test	Treatment	Species	Rotation
-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----

Institut1 Growthyr1	State1 Bioyield1	County1 #Trees	Site1	Test1	Treatment1	Species1	Rotation1

InstitutN GrowthyrN	StateN BioyieldN	CountyN #TreesN	SiteN	TestN	TreatmentN	SpeciesN	RotationN

Sorted by Rotation, Age, and Institution

Report J

Critical Parameters Sorted by Spacing

mm/dd/yy

Institut. Age	State Yield	County Spacing	Site	Test Area	Treatment Planted	Species	Rotation
-----	-----	-----	-----	-----	-----	-----	-----
Institut1 Growthyr1	State1 Bioyield1	County1 Tdensity1	Site1	Test1 Trtarea1	Treatment1	Species1	Rotation1
InstitutN	StateN	CountyN	SiteN	TestN	TreatmentN	SpeciesN	RotationN
GrowthyrN	BioyieldN	TdensityN		TrtareaN			

Sorted by Spacing and Area Planted

Report K

Herbicide Effectiveness

mm/dd/yy

Institution	Test	Herbicide	Effectiveness
-----	----	-----	-----
Institut1	Test1	Herbname1	Hbeftv1
InstitutN	TestN	HerbnameN	HbeftvN

Sorted by Institution, Test, Herbicide

Report L

Factors Affecting First-Year Survival

mm/dd/yy

Institut.	Test	Treatment	% Survival	Planting Material	Planting
Method	Adverse	Factors			
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----

Institut1	Test1	Treatmnt1	Pctsurv1	Plntmat11	Plntmthd1
	Offsite1	Drought1	Flooding1	Poorstok1	Poorsite1
Insects1	Disease1	Browzel			Weedcomp1

InstitutN	TestN	TreatmntN	PctsurvN	Plntmat1N	PlntmthdN
	OffsiteN	DroughtN	FloodingN	PoorstokN	PoorsiteN
InsectsN	DiseaseN	BrowzeN			WeedcompN

Sorted by Institution, Test, and Percent Survival

6.0 SRWCP SOFTWARE SOURCE CODE

In the sections that follow the source code that comprises the data management system will be listed. The source code of the data management system consists of (1) the data management procedures; (2) the individual report data retrieval procedures; (3) and the template generation procedures for each of the files in the SRWCP data base. The data management procedures reside on disk drive D:. The report procedures reside in the directory D:\srwcprpt. The print command files used to output the reports also reside there. The template procedures reside in directory D:\srwcpipf. The template procedures and data files have corresponding names, with different extensions to allow for easy association between the template procedure and the file it represents.


```

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)          */
    Perform "Brcrproc.ipf"
    Continue
  case 3:          /* Generate special SRWCP report ('functn'=3) */
    Perform "Spec1rpt.ipf"
    Continue
  case 4:          /* Enter KNOWLEDGEMAN to perform a custom      */
    Release All   /* query.                                         */
    Stop
  case 5:          /* Return to DOS                                  */
    Bye
Endtest
/*
  Go to top of while loop for another iteration of displaying
  the initial function menu and performing the requested oper-
  ation.
*/
Endwhile

```

SOURCE CODE OF FORM FOR INITIAL FUNCTION MENU

FORM BIOFORM

```
AT 4, 33 PUT "SRWCP DATABASE"  
AT 6, 26 PUT " INTERACTIVE QUERY SYSTEM"  
AT 9, 15 PUT "BROWSE THROUGH THE SRWCP DATABASE.....  
1"  
AT 11, 15 PUT "INPUT DATA INTO THE SRWCP DATABASE.....  
.2"  
AT 13, 15 PUT "EXTRACT DATA OR REPORT FROM SRWCP DATABASE.....  
.3"  
AT 15, 15 PUT "ENTER KNOWLEDGEMAN TO PERFORM CUSTOM QUERY.....  
.4"  
AT 17, 15 PUT "EXIT SYSTEM AND RETURN TO DOS.....  
.5"  
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 1, 1 TO 25, 80 PUT "FWBU"  
AT 8, 12 TO 18, 67 PUT "FWBA"
```

ENDFORM

SOURCE CODE OF UPDATE/INPUT CONTROL PROCEDURE

/*

TITLE: SRWCP Update/Input Procedure (BRCRPROC.IPF)
 LANGUAGE: MDBS KNOWLEDGEMAN PROCEDURE LANGUAGE.
 AUTHOR: John W. Hodges
 SYSTEM: IBM Personal Computer running under DOS 2.1.
 PURPOSE:

This procedure controls the process of inputting data into the SRWCP database. 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 or update is requested. The procedure then retrieves the file and allows the user to input data into the file or Browse the data in the file and update the data at his/her discession. These interrogations are performed using the standard BROWSE or CREATE 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 (STARTUP.IPF) by inputting a '0'. user of the system and the KNOWLEDGEMAN DBMS. This procedure calls other procedures depending upon the function requested by the user.

ROUTINE TYPE (Sub-Procedure)
 ARGUMENTS ('tblchoic' is an INTEGER variable input)
 (by this procedure. 'functn' is the variable input in (STARTUP.IPF) and will input to this program for control.)
 FILES ACCESSED (All files in the SRWCP database can be accessed)
 SUBMODULES CALLED (BRCRSCRN.IPF, CONTBR.IPF, CONTCR.IPF)
 CREATION DATE: 12/01/84

*/

/*

Retrieve the file select menu from disk 'B'; set up an infinite while loop which will be exited via a user request thru 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 "contcr.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 Biomass database.

```

*/
Putform Brcrscrn
Getform Brcrscrn
/*
  If the choice input by the user, 'tblchoic', is zero, then
  return from this procedure to the main procedure (STARTUP.IPF).
*/
If tblchoic = 0 then return; Endif
/*
  Test the value of 'tblchoic' input by the user. Retrieve the
  appropriate file and either allow input or update depending
  upon the value of 'functn' input by the user on the initial
  function menu displayed in (STARTUP.IPF). If 'functn'=1 then
  allow the data to be updated. If 'functn=2' then allow new
  data to be input.
*/
Test tblchoic
/*
  Input new or update existing data in the PROJECT IDENTIFICATION
  file.
*/
case 1:
  Include "\\srwcpipf\\projid.ipf"
  Use "\\srwcpdat\\projid.itb"
  If functn = 1 then
    Browse projid with projid;
    Putform Contbr
    Getform Contbr
  Else
    Create record for projid with projid;
    Putform Contcr
    Getform Contcr
  Endif
  finish projid
  release projid
  If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the PRIMARY INVESTIGATOR
  file.
*/
case 2:
  Include "\\srwcpipf\\priminv.ipf"
  Use "\\srwcpdat\\priminv.itb"
  If functn = 1 then
    Browse priminv with priminv;
    Putform Contbr
    Getform Contbr
  Else
    Create record for priminv with priminv;

```

```

    Putform Contcer
    Getform Contcer
  Endif
  finish priminv
  release priminv
  If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the PROJECT TITLE AND
  PUBLICATION file.
*/
case 3:
  Include "\\srwcpipf\\projdsc1.ipf"
  Use "\\srwcpdat\\projdsc1.itb"
  If functn = 1 then
    Browse projdsc1 with projdsc1;
    Putform Contbr
    Getform Contbr
  Else
    Create record for projdsc1 with projdsc1;
    Putform Contcer
    Getform Contcer
  Endif
  finish projdsc1
  release projdsc1
  If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the PROJECT TYPE OF RESEARCH
  file.
*/
case 4:
  Include "\\srwcpipf\\projdsc2.ipf"
  Use "\\srwcpdat\\projdsc2.itb"
  If functn = 1 then
    Browse projdsc2 with projdsc2;
    Putform Contbr
    Getform Contbr
  Else
    Create record for projdsc2 with projdsc2;
    Putform Contcer
    Getform Contcer
  Endif
  finish projdsc2
  release projdsc2
  If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the SITE LOCATION
  file.
*/
case 5:
  Include "\\srwcpipf\\siteloc.ipf"
  Use "\\srwcpdat\\siteloc.itb"
  If functn = 1 then

```

```
    Browse siteloc with siteloc;
    Putform Contbr
    Getform Contbr
Else
    Create record for siteloc with siteloc;
    Putform Contcr
    Getform Contcr
Endif
finish siteloc
release siteloc
If contin ="N" then Continue; Endif
/*
Input new or update existing data in the SITE AVERAGE CLIMATE
file.
*/
case 6:
    Include "\\srwcpipf\\siteac.ipf"
    Use "\\srwcpdat\\siteac.itb"
    If functn = 1 then
        Browse siteac with siteac;
        Putform Contbr
        Getform Contbr
    Else
        Create record for siteac with siteac;
        Putform Contcr
        Getform Contcr
    Endif
    finish siteac
    release siteac
    If contin ="N" then Continue; Endif
/*
Input new or update existing data in the SITE QUALITY
file.
*/
case 7:
    Include "\\srwcpipf\\siteq.ipf"
    Use "\\srwcpdat\\siteq.itb"
    If functn = 1 then
        Browse siteq with siteq;
        Putform Contbr
        Getform Contbr
    Else
        Create record for siteq with siteq;
        Putform Contcr
        Getform Contcr
    Endif
    finish siteq
    release siteq
    If contin ="N" then Continue; Endif
/*
Input new or update existing data in the SOIL CHEMISTRY
file.
```

```

*/
case 8:
  Include "\\srwcpipf\\soilc.ipf"
  Use "\\srwcpdat\\soilc.itb"
  If functn = 1 then
    Browse soilc with soilc;
    Putform Contbr
    Getform Contbr
  Else
    Create record for soilc with soilc;
    Putform Contcr
    Getform Contcr
  Endif
  finish soilc
  release soilc
  If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the SOIL PHYSICS
  file.
*/
case 9:
  Include "\\srwcpipf\\soilp.ipf"
  Use "\\srwcpdat\\soilp.itb"
  If functn = 1 then
    Browse soilp with soilp;
    Putform Contbr
    Getform Contbr
  Else
    Create record for soilp with soilp;
    Putform Contcr
    Getform Contcr
  Endif
  finish soilp
  release soilp
  If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the SITE TYPE
  file.
*/
case 10:
  Include "\\srwcpipf\\sitetyp.ipf"
  Use "\\srwcpdat\\sitetyp.itb"
  If functn = 1 then
    Browse sitetyp with sitetyp;
    Putform Contbr
    Getform Contbr
  Else
    Create record for sitetyp with sitetyp;
    Putform Contcr
    Getform Contcr
  Endif
  finish sitetyp

```

```

    release sitetyp
    If contin ="N" then Continue; Endif
/*
    Input new or update existing data in the YEARLY RAINFALL
    AND TEMPERATURE DATA file.
*/
case 11:
    Include "\\srwcpipf\\raintemp.ipf"
    Use "\\srwcpdat\\raintemp.itb"
    If functn = 1 then
        Browse raintemp with raintemp;
        Putform Contbr
        Getform Contbr
    Else
        Create record for raintemp with raintemp;
        Putform Contbr
        Getform Contbr
    Endif
    finish raintemp
    release raintemp
    If contin ="N" then Continue; Endif
/*
    Input new or update existing data in the TEST DESIGN
    file.
*/
case 12:
    Include "\\srwcpipf\\testdesn.ipf"
    Use "\\srwcpdat\\testdesn.itb"
    If functn = 1 then
        Browse testdesn with testdesn;
        Putform Contbr
        Getform Contbr
    Else
        Create record for testdesn with testdesn;
        Putform Contbr
        Getform Contbr
    Endif
    finish testdesn
    release testdesn
    If contin ="N" then Continue; Endif
/*
    Input new or update existing data in the TEST VARIABLES
    file.
*/
case 13:
    Include "\\srwcpipf\\testvars.ipf"
    Use "\\srwcpdat\\testvars.itb"
    If functn = 1 then
        Browse testvars with testvars;
        Putform Contbr
        Getform Contbr
    Else

```

```

    Create record for testvars with testvars;
    Putform Contcr
    Getform Contcr
  Endif
  finish testvars
  release testvars
  If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the TREATMENT SIZE/SPACING
  file.
*/
case 14:
  Include "\\srwcpipf\\trtsizsp.ipf"
  Use "\\srwcpdat\\trtsizsp.itb"
  If functn = 1 then
    Browse trtsizsp with trtsizsp;
    Putform Contbr
    Getform Contbr
  Else
    Create record for trtsizsp with trtsizsp;
    Putform Contcr
    Getform Contcr
  Endif
  finish trtsizsp
  release trtsizsp
  If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the SITE PREPARATION
  file.
*/
case 15:
  Include "\\srwcpipf\\siteprep.ipf"
  Use "\\srwcpdat\\siteprep.itb"
  If functn = 1 then
    Browse siteprep with siteprep;
    Putform Contbr
    Getform Contbr
  Else
    Create record for siteprep with siteprep;
    Putform Contcr
    Getform Contcr
  Endif
  finish siteprep
  release siteprep
  If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the TREATMENT PLANTING STOCK
  SOURCE file.
*/
case 16:
  Include "\\srwcpipf\\trtps1.ipf"
  Use "\\srwcpdat\\trtps1.itb"

```

```

If functn = 1 then
  Browse trtps1 with trtps1;
  Putform Contbr
  Getform Contbr
Else
  Create record for trtps1 with trtps1;
  Putform Contbr
  Getform Contbr
Endif
finish trtps1
release trtps1
If contin ="N" then Continue; Endif
/*
Input new or update existing data in the TREATMENT PLANTING STOCK
QUALITY file.
*/
case 17:
  Include "\\srwcpipf\\trtps3.ipf"
  Use "\\srwcpdat\\trtps3.itb"
  If functn = 1 then
    Browse trtps3 with trtps3;
    Putform Contbr
    Getform Contbr
  Else
    Create record for trtps3 with trtps3;
    Putform Contbr
    Getform Contbr
  Endif
  finish trtps3
  release trtps3
  If contin ="N" then Continue; Endif
/*
Input new or update existing data in the YEARLY MAINTENANCE BY
TREATMENT file.
*/
case 18:
  Include "\\srwcpipf\\yrmntrt1.ipf"
  Use "\\srwcpdat\\yrmntrt1.itb"
  If functn = 1 then
    Browse yrmntrt1 with yrmntrt1;
    Putform Contbr
    Getform Contbr
  Else
    Create record for yrmntrt1 with yrmntrt1;
    Putform Contbr
    Getform Contbr
  Endif
  finish yrmntrt1
  release yrmntrt1
  If contin ="N" then Continue; Endif
/*
Input new or update existing data in the YEARLY MAINTENANCE

```

```

      (HERBICIDE) file.
*/
case 19:
  Include "\\srwcpipf\yrmnthb.ipf"
  Use "\\srwcpdat\yrmnthb.itb"
  If functn = 1 then
    Browse yrmnthb with yrmnthb;
    Putform Contbr
    Getform Contbr
  Else
    Create record for yrmnthb with yrmnthb;
    Putform Contbr
    Getform Contbr
  Endif
  finish yrmnthb
  release yrmnthb
  If contin = "N" then Continue; Endif
/*
  Input new or update existing data in the YEARLY MAINTENANCE
  (FERTILIZATION) FILE.
*/
case 20:
  Include "\\srwcpipf\yrmntft.ipf"
  Use "\\srwcpdat\yrmntft.itb"
  If functn = 1 then
    Browse yrmntft with yrmntft;
    Putform Contbr
    Getform Contbr
  Else
    Create record for yrmntft with yrmntft;
    Putform Contbr
    Getform Contbr
  Endif
  finish yrmntft
  release yrmntft
  If contin = "N" then Continue; Endif
/*
  Input new or update existing data in the YEARLY MAINTENANCE
  (PEST CONTROL) FILE.
*/
case 21:
  Include "\\srwcpipf\yrmntpc.ipf"
  Use "\\srwcpdat\yrmntpc.itb"
  If functn = 1 then
    Browse yrmntpc with yrmntpc;
    Putform Contbr
    Getform Contbr
  Else
    Create record for yrmntpc with yrmntpc;
    Putform Contbr
    Getform Contbr
  Endif

```

```

    finish yrmntpc
    release yrmntpc
    If contin ="N" then Continue; Endif
/*
    Input new or update existing data in the YEARLY MAINTENANCE
    (CULTIVATION) FILE.
*/
case 22:
    Include "\\srwcpipf\\yrmntct.ipf"
    Use "\\srwcpdat\\yrmntct.itb"
    If functn = 1 then
        Browse yrmntct with yrmntct;
        Putform Contbr
        Getform Contbr
    Else
        Create record for yrmntct with yrmntct;
        Putform Center
        Getform Center
    Endif
    finish yrmntct
    release yrmntct
    If contin ="N" then Continue; Endif
/*
    Input new or update existing data in the YEARLY MAINTENANCE
    (MOWING) file.
*/
case 23:
    Include "\\srwcpipf\\yrmntmw.ipf"
    Use "\\srwcpdat\\yrmntmw.itb"
    If functn = 1 then
        Browse yrmntmw with yrmntmw;
        Putform Contbr
        Getform Contbr
    Else
        Create record for yrmntmw with yrmntmw;
        Putform Center
        Getform Center
    Endif
    finish yrmntmw
    release yrmntmw
    If contin ="N" then Continue; Endif
/*
    Input new or update existing data in the YEARLY MAINTENANCE
    (BROWSE CONTROL) file.
*/
case 24:
    Include "\\srwcpipf\\yrmntbc.ipf"
    Use "\\srwcpdat\\yrmntbc.itb"
    If functn = 1 then
        Browse yrmntbc with yrmntbc;
        Putform Contbr
        Getform Contbr

```

```

Else
  Create record for yrmntbc with yrmntbc;
  Putform Contcr
  Getform Contcr
Endif
finish yrmntbc
release yrmntbc
If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the YEARLY MAINTENANCE
  (IRRIGATION) file.
*/
case 25:
  Include "\\srwcpipf\\yrmntir.ipf"
  Use "\\srwcpdat\\yrmntir.itb"
  If functn = 1 then
    Browse yrmntir with yrmntir;
    Putform Contbr
    Getform Contbr
  Else
    Create record for yrmntir with yrmntir;
    Putform Contcr
    Getform Contcr
  Endif
  finish yrmntir
  release yrmntir
  If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the YEARLY MAINTENANCE
  (LIMING) file.
*/
case 26:
  Include "\\srwcpipf\\yrmntlm.ipf"
  Use "\\srwcpdat\\yrmntlm.itb"
  If functn = 1 then
    Browse yrmntlm with yrmntlm;
    Putform Contbr
    Getform Contbr
  Else
    Create record for yrmntlm with yrmntlm;
    Putform Contcr
    Getform Contcr
  Endif
  finish yrmntlm
  release yrmntlm
  If contin ="N" then Continue; Endif
/*
  Input new or update existing data in the YEARLY MEASUREMENT
  INFORMATION file.
*/
case 27:
  Include "\\srwcpipf\\yrmsmtn1.ipf"

```

```

Use "\\srwcpdat\\yrmsmtn1.itb"
If functn = 1 then
  Browse yrmsmtn1 with yrmsmtn1;
  Putform Contbr
  Getform Contbr
Else
  Create record for yrmsmtn1 with yrmsmtn1;
  Putform Contcr
  Getform Contcr
Endif
finish yrmsmtn1
release yrmsmtn1
If contin ="N" then Continue; Endif
/*
Input new or update existing data in the YEARLY HARVEST INFORMATION
file.
*/
case 28:
  Include "\\srwcpipf\\yrharvin.ipf"
  Use "\\srwcpdat\\yrharvin.itb"
  If functn = 1 then
    Browse yrharvin with yrharvin;
    Putform Contbr
    Getform Contbr
  Else
    Create record for yrharvin with yrharvin;
    Putform Contcr
    Getform Contcr
  Endif
  finish yrharvin
  release yrharvin
  If contin ="N" then Continue; Endif
/*
Input new or update existing data in the YEARLY HARVEST METHODS
file.
*/
case 29:
  Include "\\srwcpipf\\yrharvmd.ipf"
  Use "\\srwcpdat\\yrharvmd.itb"
  If functn = 1 then
    Browse yrharvmd with yrharvmd;
    Putform Contbr
    Getform Contbr
  Else
    Create record for yrharvmd with yrharvmd;
    Putform Contcr
    Getform Contcr
  Endif
  finish yrharvmd
  release yrharvmd
  If contin ="N" then Continue; Endif
/*

```

```

Input new or update existing data in the YEARLY YIELD BY TEST
file.
*/
case 30:
  Include "\\srwcpipf\\yryldtst.ipf"
  Use "\\srwcpdat\\yryldtst.itb"
  If functn = 1 then
    Browse yryldtst with yryldtst;
    Putform Contbr
    Getform Contbr
  Else
    Create record for yryldtst with yryldtst;
    Putform Contbr
    Getform Contbr
  Endif
  finish yryldtst
  release yryldtst
  If contin ="N" then Continue; Endif
/*
Input new or update existing data in the YEARLY YIELD BY TREATMENT
file.
*/
case 31:
  Include "\\srwcpipf\\yryldtrt.ipf"
  Use "\\srwcpdat\\yryldtrt.itb"
  If functn = 1 then
    Browse yryldtrt with yryldtrt;
    Putform Contbr
    Getform Contbr
  Else
    Create record for yryldtrt with yryldtrt;
    Putform Contbr
    Getform Contbr
  Endif
  finish yryldtrt
  release yryldtrt
  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

```

SOURCE CODE OF FORM FOR BROWSE OR CREATE DATA SCREEN

FORM BRCSRSCRN

```

AT 2, 31 PUT " SRWCP DATABASE"
AT 3, 31 PUT "   DATA FILES"
AT 5, 6 PUT "Project Identification.....1"
AT 5, 45 PUT "Trtmt. Planting Stock Quality.17"
AT 6, 6 PUT "Primary Investigator.....2"
AT 6, 45 PUT "Yearly Maintenance/Trtmt.....18"
AT 7, 6 PUT "Project Title and Pblctns.....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 Climate.....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 Rainfall/Temp. Data...11"
AT 15, 45 PUT "Yearly Measurement Info.....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 24, 2 PUT "Please Select Data File to Browse/Update or 0 to
Stop:" WITH "L"
AT 24, 57 GET TBLCHOIC NUM USING "dd"
AT 1, 1 TO 25, 80 PUT "FWBU"
AT 25, 1 TO 25, 1 PUT "FWBA"

```

ENDFORM

SOURCE CODE OF FORM FOR CONTINUE PROMPT

```
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
```

6.2 REPORT PROCEDURE SOURCE CODE

SOURCE CODE OF REPORT GENERATION CONTROL PROCEDURE

/*

TITLE: SRWCP Report Printing Procedure (SPECCLRPT.IPF)
 LANGUAGE: MDBS KNOWLEDGEMAN PROCEDURE LANGUAGE.
 AUTHOR: John W. Hodges
 SYSTEM: IBM Personal Computer running under DOS 2.1.
 PURPOSE:

This procedure controls the process of reporting on data in the SRWCP database. 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 report which is desired to be printed. The procedure then retrieves the appropriate sub-procedure which prints the desired report. 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 select menu to be displayed and the user can select another report or the user can stop altogether and return to the main menu (STARTUP.IPF) by inputting a '0'.

ROUTINE TYPE (Sub-Procedure)
 ARGUMENTS ('tblchoic' is an INTEGER variable input)
 (by this procedure.)
 SUBPROCEDURES
 ACCESSED (All report procedures for the SRWCP database
 can be accessed)
 SUBMODULES CALLED (RPTSCRN.IPF, CONTRPT.IPF)
 CREATION DATE: 6/05/85

*/

/*

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

*/

Include "Rptscrn.ipf"
 Include "contrpt.ipf"
 Let e.lstr=35
 Let forever=true
 While forever=true Do

/*

Paint the report select menu on the screen and request the user to input the desired report.

*/

Let e.oprn=false
 Putform Rptscrn
 Getform Rptscrn

```

/*
  If the choice input by the user, 'tblchoic', is zero, then
  return from this procedure to the main procedure (STARTUP.IPF).
*/
If tblchoic = 0 then return; Endif
/*
  Test the value of 'tblchoic' input by the user. Retrieve the
  appropriate report printing procedure and produce the report.
*/
Test tblchoic
/*
  Print Report A.
*/
case 1:
  Eject
  Output "Printing of Report A in Progress"
  Print text "\\srwcp rpt\\reporta.txt"
  Let e.oprn=false
  Putform Contrpt
  Getform Contrpt
  If contin="N" then Continue; Endif
/*
  Print Report B.
*/
case 2:
  Eject
  Output "Printing of Report B in Progress"
  Print text "\\srwcp rpt\\reportb.txt"
  Let e.oprn=false
  Putform Contrpt
  Getform Contrpt
  If contin="N" then Continue; Endif
/*
  Print Report C.
*/
case 3:
  Eject
  Output "Printing of Report C in Progress"
  Print text "\\srwcp rpt\\reportc.txt"
  Let e.oprn=false
  Putform Contrpt
  Getform Contrpt
  If contin="N" then Continue; Endif
/*
  Print Report D.
*/
case 4:
  Eject
  Output "Printing of Report D in Progress"
  Print text "\\srwcp rpt\\reportd.txt"
  Let e.oprn=false
  Putform Contrpt

```

```

    Getform Contrpt
    If contin="N" then Continue; Endif
/*
    Print Report E.
*/
case 5:
    Eject
    Output "Printing of Report E in Progress"
    Print text "\\srwcp rpt\\reporte.txt"
    Let e.oprn=false
    Putform Contrpt
    Getform Contrpt
    If contin="N" then Continue; Endif
/*
    Print Report F.
*/
case 6:
    Eject
    Output "Printing of Report F in Progress"
    Print text "\\srwcp rpt\\reportf.txt"
    Let e.oprn=false
    Putform Contrpt
    Getform Contrpt
    If contin="N" then Continue; Endif
/*
    Print Report G.
*/
case 7:
    Eject
    Output "Printing of Report G in Progress"
    Print text "\\srwcp rpt\\reportg.txt"
    Let e.oprn=false
    Putform Contrpt
    Getform Contrpt
    If contin="N" then Continue; Endif
/*
    Print Report H.
*/
case 8:
    Eject
    Output "Printing of Report H in Progress"
    Print text "\\srwcp rpt\\reporth.txt"
    Let e.oprn=false
    Putform Contrpt
    Getform Contrpt
    If contin="N" then Continue; Endif
/*
    Print Report I.
*/
case 9:
    Eject
    Output "Printing of Report I in Progress"

```

```

Print text "\\srwcp rpt\\reporti.txt"
Let e.oprn=false
Putform Contrpt
Getform Contrpt
If contin="N" then Continue; Endif
/*
Print Report J.
*/
case 10:
Eject
Output "Printing of Report J in Progress"
Print text "\\srwcp rpt\\reportj.txt"
Let e.oprn=false
Putform Contrpt
Getform Contrpt
If contin="N" then Continue; Endif
/*
Print Report K.
*/
case 11:
Eject
Output "Printing of Report K in Progress"
Print text "\\srwcp rpt\\reportk.txt"
Let e.oprn=false
Putform Contrpt
Getform Contrpt
If contin="N" then Continue; Endif
/*
Print Report L.
*/
case 12:
Eject
Output "Printing of Report L in Progress"
Print text "\\srwcp rpt\\reportl.txt"
Let e.oprn=false
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

```

SOURCE CODE OF FORM FOR REPORT GENERATION MENU

```

FORM RPTSCRN
  AT 2, 28 PUT "SRWCP DATABASE REPORTS"
  AT 5, 6 PUT "Report A -- Number of Projects and Sites per Spec
ies.....1"
  AT 6, 6 PUT "Report B -- Number of Species and Sites per Proje
ct.....2"
  AT 7, 6 PUT "Report C -- Yields by Project and Species.....
.....3"
  AT 8, 6 PUT "Report D -- Yields by Site Quality, Species, and
State.....4"
  AT 9, 6 PUT "Report E -- Yields by Irgn. Level, Site Quality,
Species, & Project.5"
  AT 10, 6 PUT "Report F -- Yields by Site Qual., State, and Spe
cies w/ Fertilizer..6"
  AT 11, 6 PUT "Report G -- Treatment Yield of Species by Region
.....7"
  AT 12, 6 PUT "Report H -- Critical Parameters Sorted by Specie
s.....8"
  AT 13, 6 PUT "Report I -- Critical Parameters Sorted by Age...
.....9"
  AT 14, 6 PUT "Report J -- Critical Parameters Sorted by Spacin
g.....10"
  AT 15, 6 PUT "Report K -- Herbicide Effectiveness.....
.....11"
  AT 16, 6 PUT "Report L -- Factors Affecting First Year Surviva
l.....12"
  AT 24, 2 PUT "Please Select Report to be Printed or 0 to Stop:
" WITH "L"
  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

```

SOURCE CODE OF FORM FOR REPORT GENERATION 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

```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT A.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.bp
.nf
.ah 'Report A'Number of Projects and Sites per Species''
.ev ?#date
.hx
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for
  Report A.
*/
.br
.ev let e.pwid=120
.ev Perform "\\srwcprrpt\\reporta.ipf"
.ev let e.pwid=80
.af 'Page % 'Data Reported From SRWCP Database - 1985''

```

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR REPORT A.

```

/*
  Set up report header.
*/
dim #legend(3)
#legend(1)="Species"
#legend(2)="Institution"
#legend(3)="Sites Planted"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\\trtps1"
use "\\srwcpdat\\projid"
let e.serr=false
let e.legh=true
let e.suph=false
let e.stat=false
let e.spgn=true
let e.peje=""
print chr(15)
/*
  Retrieve and print report data.
*/
Select all unique trtps1.species using "rrrrrrrrrrrrrr",\
      projid.institut using "rrrrrrrrrrrrrr",\

```

```
trtps1.site using "rrrrrrrrrrrrrr",\  
from trtps1, from projid for trtps1.subnum=projid.subnum,\  
order by az trtps1.species projid.institut trtps1.site  
let e.peje="\L"  
print chr(18)
```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT B.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.bp
.nf
.ah 'Report B'Number of Species and Sites per Project ''
.ev ?#date
.hx
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for
  Report B.
*/
.br
.ev let e.pwid=120
.ev Perform "\\srwcp rpt\\reportb.ipf"
.ev let e.pwid=80
.af 'Page % 'Data Reported From SRWCP Database - 1985''

```

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR REPORT B.

```

/*
  Set up report header.
*/
dim #legend(3)
#legend(1)="Institution"
#legend(2)="Species"
#legend(3)="Sites Planted"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\\trtps1"
use "\\srwcpdat\\projid"
let e.serr=false
let e.legh=true
let e.suph=false
let e.stat=false
let e.spgn=true
let e.peje=""
print chr(15)
/*
  Retrieve and print report data.
*/
Select all unique projid.institut using "rrrrrrrrrr",\

```

```
          trtps1.species using "rrrrrrrrrr",\  
          trtps1.site    using "rrrrrrrrrrrrrr",\  
from trtps1, from projid for trtps1.subnum=projid.subnum,\  
order by az projid.institut trtps1.species trtps1.site  
print chr(18)  
let e.peje="\L"
```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT C.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.nf
.ah 'Report C'Yields by Project and Species ''
.ev ?#date
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for
  Report C.
*/
.br
.ev let e.pwid=120
.ev Perform "\\srwcpdpt\\reportc.ipf"
.ev let e.pwid=80
.af 'Page % 'Data Reported From SRWCP Database - 1985''

```

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR REPORT C.

```

/*
  Set up report header.
*/
dim #legend(4)
#legend(1)="Institution"
#legend(2)="Species"
#legend(3)="Year"
#legend(4)="Mean Annual Production"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\\yryldtrt"
use "\\srwcpdat\\projid"
use "\\srwcpdat\\trtps1"
let e.serr=false
let e.legh=true
let e.suph=false
let e.stat=true
let e.spgn=true
print chr(15)
/*
  Retrieve and print report data.
*/
Select ALL UNIQUE projid.institut using "rrrrrrrrrr",\
      trtps1.species using "rrrrrrrr",\

```

```
        yryldtrt.calenyr    using "dddd",\  
        yryldtrt.bioyield   using "dddd.dd",\  
from yryldtrt, from trtps1 for trtps1.treatmnt=yryldtrt.treatmnt,\  
from projid for yryldtrt.subnum=projid.subnum,\  
group by yryldtrt.calenyr order by az projid.institut\  
    trtps1.species yryldtrt.calenyr yryldtrt.bioyield  
print chr(18)
```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT D.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.bp
.nf
.ah 'Report D'Yields by Site Quality, Species, and State''
.ev ?#date
.hx
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for
  Report D.
*/
.br
.ev let e.pwid=120
.ev Perform "\\srwcpdprpt\\reportd.ipf"
.ev let e.pwid=80
.af 'Page % 'Data Reported From SRWCF Database - 1985''

```

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR REPORT D.

```

/*
  Set up report header.
*/
dim #legend(6)
#legend(1)="State"
#legend(2)="Species Evaluated"
#legend(3)="Site Quality"
#legend(4)="Rotation"
#legend(5)="Age"
#legend(6)="Mean Annual Production"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\\yryldtrt"
use "\\srwcpdat\\siteloc"
use "\\srwcpdat\\siteq"
use "\\srwcpdat\\trtps1"
let e.serr=false
let e.legh=true
let e.suph=false
let e.stat=true
let e.spgn=true
print chr(15)

```

```
/*
  Retrieve and print report data.
*/
Select all unique siteloc.state          using "rr",\
      trtps1.species                    using "rrrrrrrr",\
      siteq.siteequal                   using "rrrrrr",\
      yryldtrt.rotation                 using "d.d",\
      yryldtrt.growthyr                 using "d.dd",\
      yryldtrt.bioyield                 using "dddd.dd",\

from yryldtrt,\
from trtps1 for trtps1.treatmnt=yryldtrt.treatmnt,\
from siteloc for yryldtrt.site=siteloc.site,\
from siteq for yryldtrt.site=siteq.site,\
group by siteq.siteequal order by az siteloc.state\
  trtps1.species siteq.siteequal yryldtrt.rotation\
  yryldtrt.growthyr yryldtrt.bioyield
print chr(18)
```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT E.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.nf
.ah 'Report E'Yields by Irgtn. Level, Site Quality, Species, and Pr
object''
.ev ?#date
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for Report E.
*/
.br
.ev let e.pwid=120
.ev Perform "\\srwcpdprpt\\reporte.ipf"
.ev let e.pwid=80

```

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR REPORT E.

```

/*
  Set up report header.
*/
dim #legend(5)
#legend(1)="Institution"
#legend(2)="Species"
#legend(3)="Site Quality"
#legend(4)="Level of Irrigation"
#legend(5)="Mean Annual Production"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\\yryldtrt"
use "\\srwcpdat\\yrmntrt1"
use "\\srwcpdat\\yrmntir"
use "\\srwcpdat\\projid"
use "\\srwcpdat\\siteq"
use "\\srwcpdat\\trtps1"
let e.serr=false
let e.legh=true
let e.suph=false
let e.stat=true
let e.spgn=true
print chr(15)
/*

```

Retrieve and print report data.

```

*/
Select all unique projid.institut using "rrrrrrrrrrrr",\
      trtps1.species using "rrrrrrrr",\
      siteq.siteequal using "rrrrrr",\
      yrmntir.amtwater using "ddddddd.ddddd",\
      yryldtrt.bioyield using "ddddddd.ddddd",\
from yryldtrt, from yrmntir for yrmntir.treatmnt=yryldtrt.treatmnt\
AND yrmntir.growthyr=yryldtrt.growthyr,\
from yrmntrt1 for yrmntrt1.treatmnt=yryldtrt.treatmnt AND\
  yrmntrt1.growthyr=yryldtrt.growthyr AND yrmntrt1.rotation=yryldtrt
.rotation\
  AND yrmntrt1.testname=yryldtrt.testname AND yrmntrt1.site=yryldtrt
.site,\
from trtps1 for yrmntir.treatmnt=trtps1.treatmnt,\
from siteq for trtps1.site=siteq.site,\
from projid for projid.subnum=siteq.subnum,\
  order by az projid.institut\
  trtps1.species yrmntir.amtwater
print chr(18)

```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT F.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.nf
.ah 'Report F'Yields by Site Qual., State, and Species with Fertilizer'
.ev ?#date
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for
  Report F.
*/
.br
.ev let e.pwid=120
.ev Perform "\\srwcpdprpt\\reportf.ipf"
.ev let e.pwid=80

```

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR REPORT F.

```

/*
  Set up report header.
*/
dim #legend(7)
#legend(1)="Species"
#legend(2)="State"
#legend(3)="Site Quality"
#legend(4)="Rotation"
#legend(5)="Age"
#legend(6)="Mean Annual Production"
#legend(7)="Fertilizer"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\\yryldtrt"
use "\\srwcpdat\\siteloc"
use "\\srwcpdat\\siteq"
use "\\srwcpdat\\trtps1"
use "\\srwcpdat\\yrmntrt1"
let e.serr=false
let e.legh=true
let e.suph=false
let e.stat=true
let e.spgn=true
print chr(15)

```

```

/*      Retrieve and print report data.
*/
Select all unique trtps1.species      using "rrrrrrrr",\
          siteloc.state                using "rr",\
          siteq.siteequal              using "rrrrrr",\
          yryldtrt.rotation            using "d.d",\
          yryldtrt.growthyr           using "dd.dd",\
          yryldtrt.bioyield            using "dddd.dd",\
          yrmntrt1.efrtfert           using "r",\
from yryldtrt, from yrmntrt1 for yryldtrt.growthyr=yrmntrt1.growthyr
r AND\
  yryldtrt.rotation=yrmntrt1.rotation AND yryldtrt.treatmnt=yrmntrt1
.treatmnt\
  AND yryldtrt.testname=yrmntrt1.testname AND yryldtrt.site=yrmntrt1
.site,\
from trtps1 for trtps1.treatmnt=yryldtrt.treatmnt,\
from siteloc for yryldtrt.site=siteloc.site,\
from siteq for yryldtrt.site=siteq.site,\
group by yryldtrt.growthyr order by az trtps1.species siteloc.state
\
  yryldtrt.growthyr yryldtrt.bioyield
print chr(18)

```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT G.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.nf
.ah 'Report G'Treatment Yield of Species by Region''
.ev ?#date
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for Report
  G.
*/
.br
.ev let e.pwid=120
.ev Perform "\\srwcpdpt\\reportg.ipf"
.ev let e.pwid=80

```

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR REPORT G.

```

/*
  Set up report header.
*/
dim #legend(8)
#legend(1)="Region"
#legend(2)="State"
#legend(3)="Species"
#legend(4)="Test Size"
#legend(5)="Treatment"
#legend(6)="Rotation"
#legend(7)="Age"
#legend(8)="Yield"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\\yryldtrt"
use "\\srwcpdat\\siteloc"
use "\\srwcpdat\\sitetyp"
use "\\srwcpdat\\trtsizsp"
use "\\srwcpdat\\trtps1"
let e.serr=false
let e.legh=true
let e.suph=false
let e.stat=true
let e.spgn=true
print chr(15)
/*

```

Retrieve and print report data.

```

*/
Select all unique sitetyp.ecoregn      using "rrrrrrrrrr",\
      siteloc.state                    using "rr",\
      trtps1.species                   using "rrrrrrrr",\
      trtsizsp.testarea                using "dddd.ddd",\
      yryldtrt.treatmnt                using "rrrrrrrrrr",\
      yryldtrt.rotation                using "d.d",\
      yryldtrt.growthyr                using "dd.d",\
      yryldtrt.bioyield                using "dddd.dd",\
from yryldtrt,from trtsizsp for trtsizsp.testname=yryldtrt.testname
, \
from trtps1 for trtps1.treatmnt=yryldtrt.treatmnt,\
from siteloc for yryldtrt.site=siteloc.site,\
from sitetyp for siteloc.site=sitetyp.site,\
group by sitetyp.ecoregn order by az sitetyp.ecoregn siteloc.state\
      trtps1.species trtsizsp.testarea yryldtrt.bioyield
print chr(18)

```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT H.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.nf
.ah 'Report H'Critical Parameters Sorted by Species''
.ev ?#date
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for Report H.
*/
.br
.ev let e.pwid=160
.ev Perform "\\srwcpdpt\\reporth.ipf"
.ev let e.pwid=80
.af 'Page % 'Data Reported From SRWCP Database - 1985''

```

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR REPORT H.

```

/*
  Set up report header.
*/
dim #legend(11)
#legend(1)="Institution"
#legend(2)="State"
#legend(3)="County"
#legend(4)="Site"
#legend(5)="Test"
#legend(6)="Treatment"
#legend(7)="Species"
#legend(8)="Rotation"
#legend(9)="Age"
#legend(10)="Yield"
#legend(11)="# Trees"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\\yryldtrt"
use "\\srwcpdat\\siteloc"
use "\\srwcpdat\\projid"
use "\\srwcpdat\\trtps1"
use "\\srwcpdat\\trtsizsp"
let e.serr=false
let e.legh=true

```

```

let e.suph=false
let e.stat=true
let e.spgn=true
print chr(15)
/*
  Retrieve and print report data.
*/
Select
    projid.subinst      using "rrrrrrrr",\
    siteloc.state       using "rr",\
    siteloc.county      using "rrrrrrrr",\
    yryldtrt.site       using "rrrrrrrr",\
    yryldtrt.testname   using "rrrrrrrr",\
    yryldtrt.treatmnt   using "rrrrrrrrrr",\
    trtps1.species      using "rrrrrrrr",\
    yryldtrt.rotation   using "dd",\
    yryldtrt.growthyr   using "dd.dd",\
    yryldtrt.bioyield   using "dddd.dd",\
    trtsizsp.ttreerep   using "dddd.dd",\

from yryldtrt,\
from trtps1 for trtps1.treatmnt=yryldtrt.treatmnt,\
from trtsizsp for trtsizsp.treatmnt=yryldtrt.treatmnt,\
from siteloc for yryldtrt.site=siteloc.site,\
from projid for yryldtrt.subnum=projid.subnum,\
  order by az trtps1.species trtsizsp.ttreerep
print chr(18)

```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT I.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.bp
.nf
.ah 'Report I'Critical Parameters Sorted by Age''
.ev ?#date
.hx
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for
  Report I.
*/
.br
.ev let e.pwid=160
.ev Perform "\\srwcpdprpt\\reporti.ipf"
.ev let e.pwid=80
.af 'Page % 'Data Reported From SRWCP Database - 1985''

```

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR REPORT I.

```

/*
  Set up report header.
*/
dim #legend(11)
#legend(1)="Subcontractor"
#legend(2)="State"
#legend(3)="County"
#legend(4)="Site"
#legend(5)="Test"
#legend(6)="Treatment"
#legend(7)="Species"
#legend(8)="Rotation"
#legend(9)="Age"
#legend(10)="Mean Ann. Yield"
#legend(11)="# Trees"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\\yryldtrt"
use "\\srwcpdat\\siteloc"
use "\\srwcpdat\\projid"
use "\\srwcpdat\\trtps1"
use "\\srwcpdat\\trtsizsp"

```

```

let e.serr=false
let e.legh=true
let e.suph=false
let e.stat=true
let e.spgn=true
print chr(15)
/*
  Retrieve and print report data.
*/
Select
      projid.institut      using "rrrrrrrr",\
      siteloc.state       using "rr",\
      siteloc.county      using "rrrrrrrr",\
      yryldtrt.site       using "rrrrrrrr",\
      yryldtrt.testname   using "rrrrrrrr",\
      yryldtrt.treatmnt   using "rrrrrrrrrr",\
      trtps1.species      using "rrrrrrrr",\
      yryldtrt.rotation   using "dd",\
      yryldtrt.growthyr   using "dd.dd",\
      yryldtrt.bioyield   using "dddd.dd",\
      trtsizsp.ttreerep   using "dddd",\

from yryldtrt,\
from trtps1 for trtps1.treatmnt=yryldtrt.treatmnt,\
from trtsizsp for trtsizsp.treatmnt=yryldtrt.treatmnt,\
from siteloc for yryldtrt.site=siteloc.site,\
from projid for yryldtrt.subnum=projid.subnum,\
  order by az yryldtrt.rotation yryldtrt.growthyr
      projid.institut
print chr(18)

```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT J.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.bp
.nf
.ah 'Report J'Critical Parameters Sorted by Spacing''
.ev ?#date
.hx
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for
  Report J.
*/
.br
.ev let e.pwid=160
.ev Perform "\\srwcp rpt\\reportj.ipf"
.ev let e.pwid=80
.af 'Page % 'Data Reported From SRWCP Database - 1985''

```

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR REPORT J.

```

/*
  Set up report header.
*/
dim #legend(13)
#legend(1)="Subcontractor"
#legend(2)="State"
#legend(3)="County"
#legend(4)="Site"
#legend(5)="Test"
#legend(6)="Treatment"
#legend(7)="Species"
#legend(8)="Rotation"
#legend(9)="Age"
#legend(10)="Yield"
#legend(11)="Spacing"
#legend(12)="Area Planted"
#legend(13)="Effort"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\yryldtrt"
use "\\srwcpdat\siteloc"
use "\\srwcpdat\projid"

```

```

use "\\srwcpdat\\trtps1"
use "\\srwcpdat\\trtsizsp"
use "\\srwcpdat\\yrmntrt1"
let e.serr=false
let e.legh=true
let e.suph=false
let e.stat=true
let e.spgn=true
print chr(15)
/*
Retrieve and print report data.
*/
Select
        projid.institut      using "rrrrrrrr",\
        sitel.state         using "rr",\
        sitel.county        using "rrrrrrrr",\
        yryldtrt.site       using "rrrrrrrr",\
        yryldtrt.testname   using "rrrrrrrr",\
        yryldtrt.treatmnt   using "rrrrrrrrrr",\
        trtps1.species      using "rrrrrrrr",\
        yryldtrt.rotation   using "dd",\
        yryldtrt.growthyr   using "dd.dd",\
        yryldtrt.bioyield   using "dddd.dd",\
        trtsizsp.tdensity   using "dddd",\
        trtsizsp.trtarea    using "d.dd",\
        yrmntrt1.olvleff    using "r",\

from yryldtrt,\
from trtps1 for trtps1.treatmnt=yryldtrt.treatmnt,\
from trtsizsp for trtsizsp.treatmnt=yryldtrt.treatmnt,\
from siteloc for yryldtrt.site=siteloc.site,\
from projid for yryldtrt.subnum=projid.subnum,\
from yrmntrt1 for yrmntrt1.rotation=yryldtrt.rotation AND\
yrmntrt1.growthyr=yryldtrt.growthyr \
AND yrmntrt1.treatmnt=yryldtrt.treatmnt AND yrmntrt1.testname=\
yryldtrt.testname AND yrmntrt1.site=yryldtrt.site,\
order by az trtsizsp.tdensity trtsizsp.trtarea yrmntrt1.olvleff
print chr(18)

```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT K.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.bp
.nf
.ah 'Report K'Herbicide Effectiveness''
.ev ?#date
.hx
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for
  Report K.
*/
.br
.ev let e.pwid=160
.ev Perform "\\srwcp rpt\\reportk.ipf"
.ev let e.pwid=80
.af 'Page % 'Data Reported From SRWCP Database - 1985''

```

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR REPORT K.

```

/*
  Set up report header.
*/
dim #legend(4)
#legend(1)="Subcontractor"
#legend(2)="Test"
#legend(3)="Herbicide"
#legend(4)="Effectinevness"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\\yrmnthb"
use "\\srwcpdat\\projid"
let e.serr=false
let e.legh=true
let e.suph=false
let e.stat=true
let e.spgn=true
print chr(15)
/*
  Retrieve and print report data.
*/
Select                projid.institut      using "rrrrrrrrrrrrrrrr",\
                      yrmnthb.testname    using "rrrrrrrrrrrrrrrr",\

```

```
                yrmnthb.herbname      using "rrrrrrrrrrrrrrrr",\  
                yrmnthb.hbeftv       using "r",\  
from yrmnthb,\  
from projid for yrmnthb.subnum=projid.subnum,\  
  order by az projid.institut yrmnthb.testname yrmnthb.herbname  
print chr(18)
```

SOURCE CODE OF TEXT FILE WHICH GENERATES REPORT L.

```

/*
  Set up environment.
*/
.ev let e.oprn=true
.ev let e.pwid=80
.bp
.nf
.ah 'Report L'Planting Data''
.ev ?#date
.hx
.br
/*
  Add report text here if desired.

  Perform the procedure which retrieves and prints data for
  Report L.
*/
.br
.ev let e.pwid=160
.ev Perform "reportl.ipf"
.ev let e.pwid=80
.af 'Page % 'Data Reported From Biomass Database - 1985''

SOURCE CODE OF PROCEDURE WHICH RETRIEVES AND PRINTS DATA FOR
REPORT L.
/*
  Set up report header.
*/
dim #legend(6)
#legend(1)="Subcontractor"
#legend(2)="Test"
#legend(3)="Treatment"
#legend(4)="% Survival"
#legend(5)="Planting Material"
#legend(6)="Planting Method"
/*
  Set up environment and open files.
*/
let e.serr=true
use "\\srwcpdat\\yryldtrt"
use "\\srwcpdat\\projid"
use "\\srwcpdat\\trtps3"
use "\\srwcpdat\\siteprep"
let e.serr=false
let e.legh=true
let e.suph=false
let e.stat=true
let e.spgn=true
print chr(15)
/*
  Retrieve and print report data.

```

```

*/
Select      projid.institut      using "rrrrrrrr",\
            yryldtrt.testname  using "rrrrrrrr",\
            yryldtrt.treatmnt  using "rrrrrrrrrr",\
            yryldtrt.petsurv   using "dd.dd",\
            trtps3.plntmatl    using "rrrrrr",\
            siteprep.plntmthd  using "rrrrrr",\
            yryldtrt.offsite   using "rrr",\
            yryldtrt.drought   using "rrr",\
            yryldtrt.flooding  using "rrr",\
            yryldtrt.poorstok  using "rrr",\
            yryldtrt.poorsite  using "rrr",\
            yryldtrt.weedcomp  using "rrr",\
            yryldtrt.insects   using "rrr",\
            yryldtrt.disease   using "rrr",\
            yryldtrt.browze    using "rrr",\

from yryldtrt,\
from trtps3 for yryldtrt.treatmnt=trtps3.treatmnt,\
from siteprep for yryldtrt.treatmnt=siteprep.treatmnt,\
from projid for yryldtrt.subnum=projid.subnum,\
  order by az projid.institut yryldtrt.testname yryldtrt.petsurv
print chr(18)

```

6.3 TEMPLATE PROCEDURE SOURCE CODE

SOURCE CODE OF FORM FOR PROJECT IDENTIFICATION FILE

FORM PROJID

```

AT 1, 1 TO 1, 60 PUT "FWBU"
AT 2, 1 TO 24, 80 PUT "FWBU"
AT 2, 4 PUT "Project Identification"
AT 4, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 5, 5 PUT "Key Name" WITH "L"
AT 6, 5 PUT "Subcontracting Institution" WITH "L"
AT 8, 5 PUT "DOE Grant Start Date" WITH "L"
AT 9, 5 PUT "DOE Grant End Date" WITH "L"
AT 10, 5 PUT "ORNL Subcontract Start Date" WITH "L"
AT 11, 5 PUT "ORNL Subcontract End Date" WITH "L"
AT 12, 5 PUT "Current Project Duration" WITH "L"
AT 13, 5 PUT "Current Accumulative Cost to DOE" WITH "L"
AT 4, 40 GET SUBNUM
AT 4, 40 PUT SUBNUM
AT 5, 40 GET KEYNAME
AT 5, 40 PUT KEYNAME
AT 6, 40 GET INSTITUT
AT 6, 40 PUT INSTITUT
AT 8, 40 GET DOESDAT
AT 8, 40 PUT DOESDAT
AT 9, 40 GET DOEEDAT
AT 9, 40 PUT DOEEDAT
AT 10, 40 GET ORNLSDAT
AT 10, 40 PUT ORNLSDAT
AT 11, 40 GET ORNLEDAT
AT 11, 40 PUT ORNLEDAT
AT 12, 40 GET PROJDRTN
AT 12, 40 PUT PROJDRTN
AT 13, 40 GET COSTODOE
AT 13, 40 PUT COSTODOE
AT 14, 5 PUT "Current Accumulative Cost to ORNL" WITH "L"
AT 14, 40 GET COSTORNL STR USING "$ddddddd.dd"
AT 14, 40 PUT COSTORNL USING "$ddddddd.dd"
AT 15, 5 PUT "Current ORNL Technical Contact" WITH "L"
AT 15, 40 GET TECHCON
AT 15, 40 PUT TECHCON
AT 16, 5 PUT "Current ORNL Purchasing Agent" WITH "L"
AT 16, 40 GET PURAGENT
AT 16, 40 PUT PURAGENT
AT 17, 5 PUT "Date of Latest Update" WITH "L"
AT 17, 40 GET UPDTDATE
AT 17, 40 PUT UPDTDATE

```

ENDFORM

SOURCE CODE OF FORM FOR PRIMARY INVESTIGATOR FILE

FORM PRIMINV

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 4 PUT "Principal Investigator"
AT 4, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 5, 5 PUT "Principal Investigator Name" WITH "L"
AT 6, 5 PUT "Address" WITH "L"
AT 11, 5 PUT "Phone Number" WITH "L"
AT 4, 40 GET SUBNUM
AT 4, 40 PUT SUBNUM
AT 5, 40 GET PINAME
AT 5, 40 PUT PINAME
AT 7, 10 GET PIADDR1
AT 7, 10 PUT PIADDR1
AT 8, 10 GET PIADDR2
AT 8, 10 PUT PIADDR2
AT 9, 10 GET PIADDR3
AT 9, 10 PUT PIADDR3
AT 10, 10 GET PIADDR4
AT 10, 10 PUT PIADDR4
AT 11, 40 GET PIPHONE
AT 11, 40 PUT PIPHONE

```

ENDFORM

SOURCE CODE OF FORM FOR PROJECT TITLE AND PUBLICATIONS FILE

FORM PROJDSCL

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 4 PUT "Project Title and Publications"
AT 4, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 5, 5 PUT "Key Name" WITH "L"
AT 6, 5 PUT "Full Title of Project" WITH "L"
AT 11, 5 PUT "List Published Papers Containing Yield Data Repo
rted Here" WITH "L"
AT 4, 40 GET SUBNUM
AT 4, 40 PUT SUBNUM
AT 5, 40 GET KEYNAME
AT 5, 40 PUT KEYNAME
AT 7, 10 GET PROJTITL
AT 7, 10 PUT PROJTITL
AT 12, 10 GET PBLPPRS
AT 12, 10 PUT PBLPPRS

```

ENDFORM

SOURCE CODE OF FORM FOR PROJECT TYPE OF RESEARCH FILE

FORM PROJDS2

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 4 PUT "Project Type of Research"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 6, 4 PUT "Types of Numerical Data Collected (X or blank)"
AT 7, 5 PUT "Growth Rate Information (height, diameter, etc.)"
WITH "L"
AT 8, 5 PUT "Total Biomass Yield Estimates (wet and dry weight
s)" WITH "L"
AT 9, 5 PUT "Total Energy Yield Estimates (kcal/g)" WITH "L"
AT 10, 5 PUT "Tree Component Biomass Yields" WITH "L"
AT 11, 5 PUT "Tree Component Energy Yields" WITH "L"
AT 12, 5 PUT "Wood Characteristics (eg. bulk density, specific
gravity," WITH "L"
AT 13, 7 PUT "%ash)" WITH "L"
AT 14, 5 PUT "Nutrient Budget Information (eg. soil nutrients,
foliar " WITH "L"
AT 15, 7 PUT "nutrients, soil nutrient status change)" WITH "
L"
AT 16, 5 PUT "Structural or Physiological Characteristics (eg.
LAI, photo" WITH "L"
AT 17, 7 PUT "synthesis rate etc.)" WITH "L"
AT 18, 5 PUT "Genetic Gain" WITH "L"
AT 19, 5 PUT "Coppice Success (eg. #coppice sprouts/stump, %co
ppicing)" WITH "L"
AT 20, 5 PUT "Disease Incidence" WITH "L"
AT 21, 5 PUT "Pest Incidence" WITH "L"
AT 22, 5 PUT "Browsing Frequency" WITH "L"
AT 23, 5 PUT "Economic Data" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 7, 67 GET GRTHRATE
AT 7, 67 PUT GRTHRATE
AT 8, 67 GET BYLDEST
AT 8, 67 PUT BYLDEST
AT 9, 67 GET EYLDEST
AT 9, 67 PUT EYLDEST
AT 10, 67 GET TREEBYLD
AT 10, 67 PUT TREEBYLD
AT 11, 67 GET TREEEYLD
AT 11, 67 PUT TREEEYLD
AT 13, 67 GET WOODCHAR
AT 13, 67 PUT WOODCHAR
AT 15, 67 GET NUTRBUDG
AT 15, 67 PUT NUTRBUDG
AT 17, 67 GET PHYSCHAR
AT 17, 67 PUT PHYSCHAR
AT 18, 67 GET GENGAIN
AT 18, 67 PUT GENGAIN

```

AT 19, 67 GET COPPSUCC
 AT 19, 67 PUT COPPSUCC
 AT 20, 67 GET DISEAINC
 AT 20, 67 PUT DISEAINC
 AT 21, 67 GET PESTINC
 AT 21, 67 PUT PESTINC
 AT 22, 67 GET BROWFREQ
 AT 22, 67 PUT BROWFREQ
 AT 23, 67 GET ECONDATA
 AT 23, 67 PUT ECONDATA

ENDFORM

SOURCE CODE OF FORM FOR SITE LOCATION FILE

FORM SITELOC

AT 1, 1 TO 24, 80 PUT "FWBU"
 AT 2, 5 PUT "Site Location"
 AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
 AT 4, 5 PUT "Key Name" WITH "L"
 AT 5, 5 PUT "Site Code" WITH "L"
 AT 6, 5 PUT "State Code" WITH "L"
 AT 3, 35 GET SUBNUM
 AT 3, 35 PUT SUBNUM
 AT 4, 35 GET KEYNAME
 AT 4, 35 PUT KEYNAME
 AT 5, 35 GET SITE
 AT 5, 35 PUT SITE
 AT 6, 35 GET STATE
 AT 6, 35 PUT STATE
 AT 7, 5 PUT "State FIPS Number" WITH "L"
 AT 7, 35 GET SFIPSNO
 AT 7, 35 PUT SFIPSNO
 AT 8, 5 PUT "County" WITH "L"
 AT 8, 35 GET COUNTY
 AT 8, 35 PUT COUNTY
 AT 9, 5 PUT "County FIPS Number" WITH "L"
 AT 9, 35 GET CFIPSNO
 AT 9, 35 PUT CFIPSNO
 AT 10, 5 PUT "Latitude" WITH "L"
 AT 10, 35 GET LATITUDE
 AT 10, 35 PUT LATITUDE
 AT 11, 5 PUT "Longitude" WITH "L"
 AT 11, 35 GET LONGITUD
 AT 11, 35 PUT LONGITUD
 AT 12, 5 PUT "Area Planted (ha)" WITH "L"
 AT 12, 35 GET AREAPLTD
 AT 12, 35 PUT AREAPLTD
 AT 13, 5 PUT "Region Code" WITH "L"
 AT 13, 35 GET REGION
 AT 13, 35 PUT REGION

ENDFORM

SOURCE CODE OF FORM FOR SITE AVERAGE CLIMATE FILE

FORM SITEac

AT 1, 1 TO 24, 80 PUT "FWBU"
 AT 2, 5 PUT "Site Average Climate"
 AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
 AT 4, 5 PUT "Key Name" WITH "L"
 AT 5, 5 PUT "Site Code" WITH "L"
 AT 6, 5 PUT "Average Number Frost-Free Days per Year" WITH "L"

AT 7, 5 PUT "Mean Degree-Days (c - days)" WITH "L"
 AT 8, 5 PUT "(assume 5.5 C as base temp)" WITH "L"
 AT 9, 5 PUT "Average Annual Rainfall (cm)" WITH "L"
 AT 10, 7 PUT "Standard Deviation" WITH "L"
 AT 11, 5 PUT "Average Growing Season Rainfall (cm)" WITH "L"
 AT 12, 7 PUT "Standard Deviation" WITH "L"

AT 3, 35 GET SUBNUM
 AT 3, 35 PUT SUBNUM
 AT 4, 35 GET KEYNAME
 AT 4, 35 PUT KEYNAME
 AT 5, 35 GET SITE
 AT 5, 35 PUT SITE
 AT 6, 45 GET AVGFFDAY
 AT 6, 45 PUT AVGFFDAY
 AT 7, 45 GET MDEGDAY
 AT 7, 45 PUT MDEGDAY
 AT 9, 45 GET AVGANRRF
 AT 9, 45 PUT AVGANRRF
 AT 10, 45 GET AARFSTDV
 AT 10, 45 PUT AARFSTDV
 AT 11, 45 GET AVGGSRF
 AT 11, 45 PUT AVGGSRF
 AT 12, 45 GET AGSRSTDV
 AT 12, 45 PUT AGSRSTDV

AT 13, 5 PUT "Average Annual Solar Insolation (J/M2)" WITH "L"

AT 13, 45 GET AVGANNSI
 AT 13, 45 PUT AVGANNSI
 AT 14, 5 PUT "Average Annual Pan Evaporation (cm)" WITH "L"
 AT 14, 45 GET AVGANNPE
 AT 14, 45 PUT AVGANNPE
 AT 15, 5 PUT "Evapotranspiration Index (Thorntwaite)" WITH "

L"

AT 15, 45 GET EVPTRPDX
 AT 15, 45 PUT EVPTRPDX
 AT 16, 5 PUT "Normal Rainfall Regime" WITH "L"
 AT 16, 45 PUT RAINREGM
 AT 16, 45 GET RAINREGM

```

L"   AT 17, 5 PUT "Avg. Number Months with Rainfall < 3 cm" WITH "
      AT 17, 45 GET NDRYMO
      AT 17, 45 PUT NDRYMO
L"   AT 18, 5 PUT "Avg. Amt. Rainfall in Driest Month (cm)" WITH "
      AT 18, 45 GET DRYMOREF
      AT 18, 45 PUT DRYMOREF
      AT 19, 5 PUT "Annual Maximum Temperature (C)" WITH "L"
      AT 19, 45 GET ANNTMAX
      AT 19, 45 PUT ANNTMAX
      AT 20, 5 PUT "Annual Minimum Temperature (C)" WITH "L"
      AT 20, 45 GET ANNTMIN
      AT 20, 45 PUT ANNTMIN
      AT 21, 5 PUT "Average Annual Temperature (C)" WITH "L"
      AT 21, 45 GET ANNTEMP
      AT 21, 45 PUT ANNTEMP
      AT 22, 5 PUT "Annual Moisture Index" WITH "L"
      AT 22, 45 GET ANNMI
      AT 22, 45 PUT ANNMI
ENDFORM

```

SOURCE CODE OF FORM FOR SITE QUALITY FILE

FORM SITEQ

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Site Quality"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Past Use" WITH "L"
AT 7, 5 PUT "Site Index (by timber species/age)" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET PASTUSE
AT 6, 40 PUT PASTUSE
AT 7, 40 GET SITENDEX
AT 7, 40 PUT SITENDEX
AT 8, 5 PUT "Land Capability Classes" WITH "L"
AT 8, 40 GET LANDCLAS
AT 8, 40 PUT LANDCLAS
AT 9, 5 PUT " (SCS Ratings)" WITH "L"
AT 10, 5 PUT "Soil Classification Name" WITH "L"
AT 10, 30 PUT "(according to U.S. Soil Taxonomy)" WITH "L"
AT 11, 8 GET SOILCLAS
AT 11, 8 PUT SOILCLAS
AT 12, 5 PUT "Soil Series Name" WITH "L"

```

AT 12, 22 PUT "(according to U.S. Soil Taxonomy)" WITH "L"
 AT 13, 8 GET SOILSERS
 AT 13, 8 PUT SOILSERS
 AT 14, 5 PUT "Normal Yield of Agricultural Crop" WITH "L"
 AT 14, 54 GET AGRIYIEL
 AT 14, 54 PUT AGRIYIEL
 AT 15, 5 PUT "Opinion of Site Potential Production (Mg/ha/yr)"
 WITH "L"
 AT 15, 54 GET SITEQUAL
 AT 15, 54 PUT SITEQUAL
 AT 16, 5 PUT "Severity of Soil Degradation" WITH "L"
 AT 16, 54 GET DEGRADTN
 AT 16, 54 PUT DEGRADTN
 AT 17, 5 PUT "Type of Degradation" WITH "L"
 AT 17, 54 GET TYPEDGRN
 AT 17, 54 PUT TYPEDGRN
 ENDFORM

SOURCE CODE OF FORM FOR SOIL CHEMISTRY
FILE

FORM SOILC

AT 1, 1 TO 24, 80 PUT "FWBU"
 AT 2, 5 PUT "Site Chemistry"
 AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
 AT 4, 5 PUT "Key Name" WITH "L"
 AT 5, 5 PUT "Site Code" WITH "L"
 AT 6, 5 PUT "Depth (cm)" WITH "L"
 AT 7, 5 PUT "Horizon" WITH "L"
 AT 8, 5 PUT "Water pH (standard units)" WITH "L"
 AT 9, 5 PUT "Salt pH (standard units)" WITH "L"
 AT 10, 5 PUT "Cation Exchange Capacity (me/100gm)" WITH "L"
 AT 11, 5 PUT "Total Calcium (ppm)" WITH "L"
 AT 12, 5 PUT "Exchangeable Calcium (ppm)" WITH "L"
 AT 13, 5 PUT "Total Potassium (ppm)" WITH "L"
 AT 14, 5 PUT "Exchangeable Calcium (ppm)" WITH "L"
 AT 15, 5 PUT "Total Magnesium (ppm)" WITH "L"
 AT 16, 5 PUT "Exchangeable Magnesium (ppm)" WITH "L"
 AT 17, 5 PUT "Total Nitrogen (ppm)" WITH "L"
 AT 18, 5 PUT "Minimum Nitrogen (ppm)" WITH "L"
 AT 19, 5 PUT "Total Phosphorous (ppm)" WITH "L"
 AT 20, 5 PUT "Available Phosphorous (ppm)" WITH "L"
 AT 21, 5 PUT "Phosphorous Extraction Method" WITH "L"
 AT 22, 5 PUT "Total Carbon (%)" WITH "L"
 AT 3, 40 GET SUBNUM
 AT 3, 40 PUT SUBNUM
 AT 4, 40 GET KEYNAME
 AT 4, 40 PUT KEYNAME
 AT 5, 40 GET SITE
 AT 5, 40 PUT SITE

```

AT 6, 40 GET DEPTH
AT 6, 40 PUT DEPTH
AT 7, 40 GET HORIZON
AT 7, 40 PUT HORIZON
AT 8, 40 GET WPH
AT 8, 40 PUT WPH
AT 9, 40 GET SPH
AT 9, 40 PUT SPH
AT 10, 45 GET CATIONEP
AT 10, 45 PUT CATIONEP
AT 11, 45 GET TCALC
AT 11, 45 PUT TCALC
AT 12, 45 GET EXCAL
AT 12, 45 PUT EXCAL
AT 13, 45 GET TPOT
AT 13, 45 PUT TPOT
AT 14, 45 GET EXPOT
AT 14, 45 PUT EXPOT
AT 15, 45 GET TMAG
AT 15, 45 PUT TMAG
AT 16, 45 GET EXMAG
AT 16, 45 PUT EXMAG
AT 17, 45 GET TNIT
AT 17, 45 PUT TNIT
AT 18, 45 GET MINNIT
AT 18, 45 PUT MINNIT
AT 19, 45 GET TPHOSP
AT 19, 45 PUT TPHOSP
AT 20, 45 GET APHOSP
AT 20, 45 PUT APHOSP
AT 21, 40 GET PHEXTMTH
AT 21, 40 PUT PHEXTMTH
AT 22, 45 GET TCARBON
AT 22, 45 PUT TCARBON

```

ENDFORM

SOURCE CODE OF FORM FOR SOIL PHYSICS FILE

FORM SOILP

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Soil Physics"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Bulk Density" WITH "L"
AT 7, 5 PUT "Stoniness (% > 2mm)" WITH "L"
AT 8, 5 PUT "Soil Water Storage Capacity (cm H2O/cm soil)" WI
TH "L"
AT 9, 5 PUT "Soil Texture" WITH "L"
AT 10, 5 PUT " % Sand" WITH "L"
AT 11, 5 PUT " % Silt" WITH "L"

```

```

AT 12, 5 PUT " % Clay" WITH "L"
AT 13, 5 PUT "Soil Organic Matter (%)" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET BULKDENS
AT 6, 40 PUT BULKDENS
AT 7, 40 GET STONINES
AT 7, 40 PUT STONINES
AT 8, 50 GET SWSTGCAP
AT 8, 50 PUT SWSTGCAP
AT 10, 45 GET PCTSAND
AT 10, 45 PUT PCTSAND
AT 11, 45 GET PCTSILT
AT 11, 45 PUT PCTSILT
AT 12, 45 GET PCTCLAY
AT 12, 45 PUT PCTCLAY
AT 13, 45 GET SOILORGM
AT 13, 45 PUT SOILORGM
AT 14, 5 PUT "Depth to Watertable (cm)" WITH "L"
AT 14, 45 GET DPTOWTBL
AT 14, 45 PUT DPTOWTBL
AT 15, 5 PUT "Depth to Carbonates (cm)" WITH "L"
AT 15, 45 GET DPTOCARB
AT 15, 45 PUT DPTOCARB
AT 16, 5 PUT "Depth to Limiting Horizon (cm)" WITH "L"
AT 16, 45 GET LIMITHRZ
AT 16, 45 PUT LIMITHRZ
AT 17, 5 PUT "Drainage Description" WITH "L"
AT 17, 45 GET DRAINAGE
AT 17, 45 PUT DRAINAGE

```

ENDFORM

SOURCE CODE OF FORM FOR SITE TYPE FILE

FORM SITETYP

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Site Type"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Slope %" WITH "L"
AT 7, 5 PUT "Aspect (N,NE,S,SE,E,W,SW,NW)" WITH "L"
AT 8, 5 PUT "Elevation" WITH "L"
AT 9, 5 PUT "Topographic Location" WITH "L"
AT 10, 10 PUT "a) upland " WITH "L"
AT 11, 10 PUT "b) bottomland" WITH "L"
AT 12, 10 PUT "c) other" WITH "L"

```

```

AT 14, 5 PUT "Physiographic Region" WITH "L"
AT 15, 5 PUT "Potential Vegetation Classification" WITH "L"
AT 16, 7 PUT "(Kuchler)" WITH "L"
AT 17, 5 PUT "Forest Type" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 45 GET SLOPE
AT 6, 45 PUT SLOPE
AT 7, 45 GET ASPECT
AT 7, 45 PUT ASPECT
AT 8, 45 GET ELEVATIO
AT 8, 45 PUT ELEVATIO
AT 9, 45 GET TOPOLOC
AT 9, 45 PUT TOPOLOC
AT 14, 45 GET PHYSREGN
AT 14, 45 PUT PHYSREGN
AT 15, 45 GET VEGECLAS
AT 15, 45 PUT VEGECLAS
AT 17, 45 GET FORESTYP
AT 17, 45 PUT FORESTYP
AT 18, 7 PUT "(U.S. Forest Service Rating)" WITH "L"
AT 19, 5 PUT "Land Resource Region" WITH "L"
AT 19, 45 GET LNRSCRN
AT 19, 45 PUT LNRSCRN
AT 20, 7 PUT "(National Resource Inventory)" WITH "L"
AT 21, 5 PUT "Ecoregion" WITH "L"
AT 21, 45 GET ECOREGN
AT 21, 45 PUT ECOREGN
AT 22, 7 PUT "(R.G. Baily, 1976)" WITH "L"
ENDFORM

```

SOURCE CODE OF FORM FOR RAIN AND TEMPERATURE DATA FILE

FORM RAINTEMP

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Yearly Temperature and Rainfall Data"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 5 PUT "Year" WITH "L"
AT 6, 40 GET YEAR

```

AT 6, 40 PUT YEAR
 AT 7, 5 PUT "Number of Frost-Free Days" WITH "L"
 AT 7, 40 GET NUMFFDAY
 AT 7, 40 PUT NUMFFDAY
 AT 8, 5 PUT "Degree Days (5.5 deg. base temp)" WITH "L"
 AT 8, 40 GET DEGDAY
 AT 8, 40 PUT DEGDAY
 AT 9, 5 PUT "Total Annual Rainfall (cm)" WITH "L"
 AT 9, 40 GET TARNFL
 AT 9, 40 PUT TARNFL
 AT 10, 5 PUT "Growing Season Rainfall (cm)" WITH "L"
 AT 10, 40 GET GSRNFL
 AT 10, 40 PUT GSRNFL
 AT 11, 5 PUT "Mean January Temp. (C)" WITH "L"
 AT 11, 31 GET MJANTEMP
 AT 11, 31 PUT MJANTEMP
 AT 12, 5 PUT "Mean February Temp. (C)" WITH "L"
 AT 12, 31 GET MFEBTEMP
 AT 12, 31 PUT MFEBTEMP
 AT 13, 5 PUT "Mean March Temp. (C)" WITH "L"
 AT 13, 31 GET MMARTEMP
 AT 13, 31 PUT MMARTEMP
 AT 14, 5 PUT "Mean April Temp. (C)" WITH "L"
 AT 14, 31 GET MAPRTEMP
 AT 14, 31 PUT MAPRTEMP
 AT 15, 5 PUT "Mean May Temp. (C)" WITH "L"
 AT 15, 31 GET MMAYTEMP
 AT 15, 31 PUT MMAYTEMP
 AT 16, 5 PUT "Mean June Temp. (C)" WITH "L"
 AT 16, 31 GET MJUNTEMP
 AT 16, 31 PUT MJUNTEMP
 AT 17, 5 PUT "Mean July Temp. (C)" WITH "L"
 AT 17, 31 GET MJULTEMP
 AT 17, 31 PUT MJULTEMP
 AT 18, 5 PUT "Mean August Temp. (C)" WITH "L"
 AT 18, 31 GET MAUGTEMP
 AT 18, 31 PUT MAUGTEMP
 AT 19, 5 PUT "Mean September Temp. (C)" WITH "L"
 AT 19, 31 GET MSEPTEMP
 AT 19, 31 PUT MSEPTEMP
 AT 20, 5 PUT "Mean October Temp. (C)" WITH "L"
 AT 20, 31 GET MOCTTEMP
 AT 20, 31 PUT MOCTTEMP
 AT 21, 5 PUT "Mean November Temp. (C)" WITH "L"
 AT 21, 31 GET MNOVTEMP
 AT 21, 31 PUT MNOVTEMP
 AT 22, 5 PUT "Mean December Temp. (C)" WITH "L"
 AT 22, 31 GET MDECTEMP
 AT 22, 31 PUT MDECTEMP
 AT 11, 48 PUT "Total January Rainfall" WITH "L"
 AT 11, 73 GET TJANRNFL
 AT 11, 73 PUT TJANRNFL

```

AT 12, 48 PUT "Total February Rainfall" WITH "L"
AT 12, 73 GET TFEBRNFL
AT 12, 73 PUT TFEBRNFL
AT 13, 48 PUT "Total March Rainfall" WITH "L"
AT 13, 73 GET TMARRNFL
AT 13, 73 PUT TMARRNFL
AT 14, 48 PUT "Total April Rainfall" WITH "L"
AT 14, 73 GET TAPRRNFL
AT 14, 73 PUT TAPRRNFL
AT 15, 48 PUT "Total May Rainfall" WITH "L"
AT 15, 73 GET TMAYRNFL
AT 15, 73 PUT TMAYRNFL
AT 16, 48 PUT "Total June Rainfall" WITH "L"
AT 16, 73 GET TJUNRNFL
AT 16, 73 PUT TJUNRNFL
AT 17, 48 PUT "Total July Rainfall" WITH "L"
AT 17, 73 GET TJULRNFL
AT 17, 73 PUT TJULRNFL
AT 18, 48 PUT "Total August Rainfall" WITH "L"
AT 18, 73 GET TAUGRNFL
AT 18, 73 PUT TAUGRNFL
AT 19, 48 PUT "Total September Rainfall" WITH "L"
AT 19, 73 GET TSEPRNFL
AT 19, 73 PUT TSEPRNFL
AT 20, 48 PUT "Total October Rainfall" WITH "L"
AT 20, 73 GET TOCTRNFL
AT 20, 73 PUT TOCTRNFL
AT 21, 48 PUT "Total November Rainfall" WITH "L"
AT 21, 73 GET TNOVRNFL
AT 21, 73 PUT TNOVRNFL
AT 22, 48 PUT "Total December Rainfall" WITH "L"
AT 22, 73 GET TDECRNFL
AT 22, 73 PUT TDECRNFL

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ENDFORM

SOURCE CODE OF FORM FOR TEST DESIGN FILE

FORM TESTDESN

```

AT 1, 1 TO 25, 80 PUT "FWBU"
AT 2, 5 PUT "Test Design "
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Design (X all relevant describers)" WITH "L"
AT 8, 7 PUT "Nelder " WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME

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AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET TESTNAME
AT 6, 40 PUT TESTNAME
AT 8, 40 GET NELDER
AT 8, 40 PUT NELDER
AT 9, 7 PUT "Contiguous" WITH "L"
AT 9, 40 GET CONTIG
AT 9, 40 PUT CONTIG
AT 10, 7 PUT "Non-contiguous" WITH "L"
AT 10, 40 GET NONCONTG
AT 10, 40 PUT NONCONTG
AT 11, 7 PUT "Buffer Rows" WITH "L"
AT 11, 40 GET BUFFROWS
AT 11, 40 PUT BUFFROWS
AT 12, 7 PUT "Continuous Inventory Plots" WITH "L"
AT 12, 40 GET CONTINVP
AT 12, 40 PUT CONTINVP
AT 13, 7 PUT "Destructive Sample Plots" WITH "L"
AT 13, 40 GET DESTRSP
AT 13, 40 PUT DESTRSP
AT 14, 5 PUT "Plot (Select One)" WITH "L"
AT 14, 40 GET PLOTTYPE
AT 14, 40 PUT PLOTTYPE
AT 15, 7 PUT "a) row" WITH "L"
AT 16, 7 PUT "b) block" WITH "L"
AT 17, 7 PUT "c) single" WITH "L"
AT 18, 5 PUT "Randomization (Select One)" WITH "L"
AT 18, 40 GET RANDOM
AT 18, 40 PUT RANDOM
AT 19, 7 PUT "a) complete" WITH "L"
AT 20, 7 PUT "b) block" WITH "L"
AT 21, 7 PUT "c) latin square" WITH "L"
AT 22, 7 PUT "d) incomplete block" WITH "L"
AT 23, 7 PUT "e) interlocking block" WITH "L"
AT 24, 7 PUT "f) lattice" WITH "L"
AT 25, 7 PUT "g) other (describe)" WITH "L"

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ENDFORM

SOURCE CODE OF FORM FOR TEST VARIABLES FILE

FORM TESTVARS

```

AT 1, 1 TO 25, 80 PUT "FWBU"
AT 1, 25 PUT "Test Variables"
AT 2, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 3, 5 PUT "Key Name" WITH "L"
AT 4, 5 PUT "Site Code" WITH "L"
AT 5, 5 PUT "Test Code" WITH "L"
AT 6, 5 PUT "Design Variables (give numbers of each variable e

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valuated" WITH "L"
 AT 7, 7 PUT "by the test; 1= held constant, 0=not relevant)"
 WITH "L"
 AT 8, 7 PUT "Species" WITH "L"
 AT 2, 40 GET SUBNUM
 AT 2, 40 PUT SUBNUM
 AT 3, 40 GET KEYNAME
 AT 3, 40 PUT KEYNAME
 AT 4, 40 GET SITE
 AT 4, 40 PUT SITE
 AT 5, 40 GET TESTNAME
 AT 5, 40 PUT TESTNAME
 AT 8, 40 GET SPECIES
 AT 8, 40 PUT SPECIES
 AT 9, 7 PUT "Provenances" WITH "L"
 AT 9, 40 GET PROVNC
 AT 9, 40 PUT PROVNC
 AT 10, 7 PUT "Stands" WITH "L"
 AT 10, 40 GET STANDS
 AT 10, 40 PUT STANDS
 AT 11, 7 PUT "Families" WITH "L"
 AT 11, 40 GET FAMILIES
 AT 11, 40 PUT FAMILIES
 AT 12, 7 PUT "Clones" WITH "L"
 AT 12, 40 GET CLONES
 AT 12, 40 PUT CLONES
 AT 13, 7 PUT "Establishment Methods" WITH "L"
 AT 13, 40 GET ESTEMTHD
 AT 13, 40 PUT ESTEMTHD
 AT 14, 7 PUT "Fertility Levels" WITH "L"
 AT 14, 40 GET FERTILTY
 AT 14, 40 PUT FERTILTY
 AT 15, 7 PUT "Irrigation Levels" WITH "L"
 AT 15, 40 GET IRRIGATN
 AT 15, 40 PUT IRRIGATN
 AT 16, 7 PUT "Cultivation Level or Types" WITH "L"
 AT 16, 40 GET CULTVATN
 AT 16, 40 PUT CULTVATN
 AT 17, 7 PUT "Wastewater Levels" WITH "L"
 AT 17, 40 GET WSTWATER
 AT 17, 40 PUT WSTWATER
 AT 18, 7 PUT "Herbicide Types" WITH "L"
 AT 18, 40 GET HERBICID
 AT 18, 40 PUT HERBICID
 AT 19, 7 PUT "Spacing (tree densities)" WITH "L"
 AT 19, 40 GET SPACING
 AT 19, 40 PUT SPACING
 AT 20, 7 PUT "Rotation Lengths" WITH "L"
 AT 20, 40 GET ROTLNGTH
 AT 20, 40 PUT ROTLNGTH
 AT 21, 7 PUT "Harvest Methods" WITH "L"
 AT 21, 40 GET HARVMTHD

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AT 21, 40 PUT HARVMTHD
AT 22, 7 PUT "Harvest Dates" WITH "L"
AT 22, 40 GET HARVDATE
AT 22, 40 PUT HARVDATE
AT 23, 7 PUT "Interplant of N2 Fixers (#patterns)" WITH "L"
AT 23, 45 GET N2FXPATN
AT 23, 45 PUT N2FXPATN
AT 24, 7 PUT "Interplant of N2 Fixers (#species)" WITH "L"
AT 24, 45 GET N2FXSPEC
AT 24, 45 PUT N2FXSPEC

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ENDFORM

SOURCE CODE OF FORM FOR TREATMENT SIZE/SPACING FILE

FORM TRTSIZSP

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Treatment Size/Spacing"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Treatment Code" WITH "L"
AT 8, 5 PUT "Year Planted" WITH "L"
AT 9, 5 PUT "Month Planted (abbreviated)" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET TESTNAME
AT 6, 40 PUT TESTNAME
AT 7, 40 GET TREATMNT
AT 7, 40 PUT TREATMNT
AT 8, 40 GET YEARPLTD
AT 8, 40 PUT YEARPLTD
AT 9, 40 GET MNTHPLTD
AT 9, 40 PUT MNTHPLTD
AT 10, 5 PUT "Total Area Planted for Test (ha)" WITH "L"
AT 10, 40 GET TESTAREA
AT 10, 40 PUT TESTAREA
AT 11, 5 PUT "Area of Each Block Rep. (in test)" WITH "L"
AT 11, 40 GET BLOCAREA
AT 11, 40 PUT BLOCAREA
AT 12, 5 PUT "Area Per Treatment Plot (ha)" WITH "L"
AT 12, 40 GET TRTAREA
AT 12, 40 PUT TRTAREA
AT 13, 5 PUT "# Replicates" WITH "L"
AT 13, 40 GET NUMREPLS
AT 13, 40 PUT NUMREPLS
AT 14, 5 PUT "#Total Trees/Replicate" WITH "L"

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AT 14, 40 GET TTREEREP
AT 14, 40 PUT TTREEREP
AT 15, 5 PUT "#Families/Provenance" WITH "L"
AT 15, 40 GET FAMPROV
AT 15, 40 PUT FAMPROV
AT 16, 5 PUT "#Trees/Family" WITH "L"
AT 16, 40 GET TFAMREP
AT 16, 40 PUT TFAMREP
AT 17, 5 PUT "#Clones/Rep" WITH "L"
AT 17, 40 GET TCLONREP
AT 17, 40 PUT TCLONREP
AT 18, 5 PUT "#Ramets/Clone" WITH "L"
AT 18, 40 GET RAMTCLON
AT 18, 40 PUT RAMTCLON
AT 19, 5 PUT "Density (#trees/ha)" WITH "L"
AT 19, 40 GET TDENSITY
AT 19, 40 PUT TDENSITY
AT 20, 5 PUT "Closest Density" WITH "L"
AT 20, 40 GET CDENSITY
AT 20, 40 PUT CDENSITY
AT 21, 5 PUT "Widest Density" WITH "L"
AT 21, 40 GET WDENSITY
AT 21, 40 PUT WDENSITY
AT 22, 5 PUT "#Space Between Rows (m)" WITH "L"
AT 22, 40 GET ROWSPACE
AT 22, 40 PUT ROWSPACE
AT 23, 5 PUT "#Space Between Trees (m)" WITH "L"
AT 23, 40 GET TRESPACE
AT 23, 40 PUT TRESPACE
AT 24, 5 PUT "#Space Between Beds (m)" WITH "L"
AT 24, 40 GET BEDSPACE
AT 24, 40 PUT BEDSPACE

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ENDFORM

SOURCE CODE OF FORM FOR SITE PREPARATION FILE

FORM SITEPREP

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Site Preparation"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Treatment Code" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE

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AT 6, 40 GET TESTNAME
 AT 6, 40 PUT TESTNAME
 AT 7, 40 GET TREATMNT
 AT 7, 40 PUT TREATMNT
 AT 8, 5 PUT "Cultivation Type" WITH "L"
 AT 8, 40 GET CULTVATD
 AT 8, 40 PUT CULTVATD
 AT 10, 5 PUT "Preplant Procedures (X or blank)"
 AT 11, 7 PUT "Herbicides Used" WITH "L"
 AT 11, 25 GET HERBUSED
 AT 11, 25 PUT HERBUSED
 AT 11, 52 PUT "Bedding" WITH "L"
 AT 11, 67 GET BEDDING
 AT 11, 67 PUT BEDDING
 AT 12, 7 PUT "Windrowed" WITH "L"
 AT 12, 25 GET WINDROWD
 AT 12, 25 PUT WINDROWD
 AT 12, 52 PUT "Slash Chopping" WITH "L"
 AT 12, 67 GET SLASHCHF
 AT 12, 67 PUT SLASHCHF
 AT 13, 7 PUT "Stump Removal" WITH "L"
 AT 13, 25 GET STUMPRMV
 AT 13, 25 PUT STUMPRMV
 AT 15, 5 PUT "Planting Method"
 AT 15, 25 GET PLNTMTHD
 AT 15, 25 PUT PLNTMTHD
 AT 16, 7 PUT "a) Hand Planted" WITH "L"
 AT 17, 7 PUT "b) Machine Planted" WITH "L"
 AT 19, 5 PUT "Amendments at Time of Planting"
 AT 20, 5 PUT "(answer X or blank)" WITH "L"
 AT 21, 7 PUT "Fertilization" WITH "L"
 AT 21, 25 GET FERTZN
 AT 21, 25 PUT FERTZN
 AT 21, 52 PUT "Band Mulching" WITH "L"
 AT 21, 67 GET BANDMLCH
 AT 21, 67 PUT BANDMLCH
 AT 22, 7 PUT "Irrigation" WITH "L"
 AT 22, 25 GET IRRIGATN
 AT 22, 25 PUT IRRIGATN
 AT 23, 7 PUT "Seedlings Soaked" WITH "L"
 AT 23, 25 GET SEEDSOAK
 AT 23, 25 PUT SEEDSOAK
 AT 24, 7 PUT "or Dipped" WITH "L"

ENDFORM

SOURCE CODE OF FORM FOR TREATMENT PLANTING STOCK SOURCE
FILE

FORM TRTPS1

AT 1, 1 TO 24, 80 PUT "FWBU"
 AT 2, 5 PUT "Planting Stock "
 AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"

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AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Treatment Code" WITH "L"
AT 18, 7 PUT "f) Mixed Clones" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET TESTNAME
AT 6, 40 PUT TESTNAME
AT 7, 40 GET TREATMNT
AT 7, 40 PUT TREATMNT
AT 8, 5 PUT "Genus and Species or Hybrid Codes" WITH "L"
AT 8, 40 GET SPECIES
AT 8, 40 PUT SPECIES
AT 9, 5 PUT "Collection Range for Provenance Tests" WITH "L"
AT 9, 45 GET COLLRNG
AT 9, 45 PUT COLLRNG
AT 10, 5 PUT "Material Source for Yield Tests" WITH "L"
AT 10, 40 GET MTRLSRC
AT 10, 40 PUT MTRLSRC
AT 12, 5 PUT "Genetic Category (X or blank)"
AT 13, 7 PUT "a) Bulk Provenance" WITH "L"
AT 13, 40 GET BULKPROV
AT 13, 40 PUT BULKPROV
AT 14, 7 PUT "b) Bulk Stand" WITH "L"
AT 14, 40 GET BULKSTND
AT 14, 40 PUT BULKSTND
AT 15, 7 PUT "c) Half-Sib" WITH "L"
AT 15, 40 GET HALFSIB
AT 15, 40 PUT HALFSIB
AT 16, 7 PUT "d) Full-Sib" WITH "L"
AT 16, 40 GET FULLSIB
AT 16, 40 PUT FULLSIB
AT 17, 7 PUT "e) Identified Clones" WITH "L"
AT 17, 40 GET IDCLONES
AT 17, 40 PUT IDCLONES
AT 18, 40 GET MXCLONES
AT 18, 40 PUT MXCLONES
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ENDFORM

SOURCE CODE OF FORM FOR TREATMENT PLANTING STOCK QUALITY
FILE

FORM TRTPS3

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AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Treatment Planting Stock Quality"
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AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
 AT 4, 5 PUT "Key Name" WITH "L"
 AT 5, 5 PUT "Site Code" WITH "L"
 AT 6, 5 PUT "Test Code" WITH "L"
 AT 7, 5 PUT "Treatment Code" WITH "L"
 AT 9, 5 PUT "Planting Material (select one)"
 AT 10, 7 PUT "a) cutting unrooted" WITH "L"
 AT 11, 7 PUT "b) whip unrooted" WITH "L"
 AT 12, 7 PUT "c) rooted cutting" WITH "L"
 AT 13, 7 PUT "d) bareroot seedling" WITH "L"
 AT 14, 7 PUT "e) containerized seedling" WITH "L"
 AT 15, 7 PUT "f) seed" WITH "L"
 AT 16, 7 PUT "g) tissue culture plantlet" WITH "L"
 AT 17, 7 PUT "h) root cuttings" WITH "L"
 AT 18, 7 PUT "i) other" WITH "L"
 AT 3, 40 GET SUBNUM
 AT 3, 40 PUT SUBNUM
 AT 4, 40 GET KEYNAME
 AT 4, 40 PUT KEYNAME
 AT 5, 40 GET SITE
 AT 5, 40 PUT SITE
 AT 6, 40 GET TESTNAME
 AT 6, 40 PUT TESTNAME
 AT 7, 40 GET TREATMNT
 AT 7, 40 PUT TREATMNT
 AT 9, 40 GET PLNTMATL
 AT 9, 40 PUT PLNTMATL
 AT 20, 5 PUT "Age of Planting Material (months)" WITH "L"
 AT 20, 40 GET AGEPLMTL
 AT 20, 40 PUT AGEPLMTL
 AT 21, 5 PUT "Height of Planting Material (cm) " WITH "L"
 AT 21, 40 GET HGTPLMTL
 AT 21, 40 PUT HGTPLMTL
 AT 22, 5 PUT "Root collar diameter (cm)" WITH "L"
 AT 22, 40 GET RCDPLMTL
 AT 22, 40 PUT RCDPLMTL
 AT 23, 5 PUT "Lateral Root Quality" WITH "L"
 AT 23, 40 GET LRQPLMTL
 AT 23, 40 PUT LRQPLMTL
 AT 24, 5 PUT " (Good, Med, Poor)" WITH "L"

ENDFORM

SOURCE CODE OF FORM FOR YEARLY MAINTENANCE BY TREATMENT
FILE

FORM YRMNTRT1

AT 1, 1 TO 25, 80 PUT "FWBU"
 AT 2, 5 PUT "Yearly Maintenance by Treatment"
 AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
 AT 4, 5 PUT "Key Name" WITH "L"

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AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Treatment Code" WITH "L"
AT 8, 5 PUT "Calendar Year" WITH "L"
AT 9, 5 PUT "Growth Year" USING "Growth Year" WITH "L"
AT 10, 5 PUT "Rotation" WITH "L"
AT 11, 5 PUT "Overall Level of Effort" WITH "L"
AT 12, 5 PUT " (H=high, M=medium, L=low)" WITH "L"
AT 13, 5 PUT "Level of Effort Associated with Each" WITH "L"
AT 14, 5 PUT "Procedure (H,M,L, or N=none)" WITH "L"
AT 15, 7 PUT "Cultivation" WITH "L"
AT 16, 7 PUT "Mowing" WITH "L"
AT 17, 7 PUT "Herbicide Application" WITH "L"
AT 18, 7 PUT "Fertilization" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET TESTNAME
AT 6, 40 PUT TESTNAME
AT 7, 40 GET TREATMNT
AT 7, 40 PUT TREATMNT
AT 8, 40 GET CALENYR
AT 8, 40 PUT CALENYR
AT 9, 40 GET GROWTHYR
AT 9, 40 PUT GROWTHYR
AT 10, 40 GET ROTATION
AT 10, 40 PUT ROTATION
AT 11, 40 GET OLVLEFF
AT 11, 40 PUT OLVLEFF
AT 15, 40 GET EFRTCULT
AT 15, 40 PUT EFRTCULT
AT 16, 40 GET EFRTMOW
AT 16, 40 PUT EFRTMOW
AT 17, 40 GET EFRATHERB
AT 17, 40 PUT EFRATHERB
AT 18, 40 GET EFRTFERT
AT 18, 40 PUT EFRTFERT
AT 19, 7 PUT "Liming" WITH "L"
AT 19, 40 GET EFRTLIM
AT 19, 40 PUT EFRTLIM
AT 20, 7 PUT "Irrigation" WITH "L"
AT 20, 40 GET EFRTIRGN
AT 20, 40 PUT EFRTIRGN
AT 21, 7 PUT "Insect Control" WITH "L"
AT 21, 40 GET EFRTINCL
AT 21, 40 PUT EFRTINCL
AT 22, 7 PUT "Disease Control" WITH "L"
AT 22, 40 GET EFRTDSCL
AT 22, 40 PUT EFRTDSCL

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AT 23, 7 PUT "Browsing Control" WITH "L"
AT 23, 40 GET EFRTBRCL
AT 23, 40 PUT EFRTBRCL
AT 24, 7 PUT "Other" WITH "L"
AT 24, 40 GET EFRTOTHR
AT 24, 40 PUT EFRTOTHR

ENDFORM

SOURCE CODE OF FORM FOR YEARLY MAINTENANCE (HERBICIDE)
FILE

FORM YRMNTHB

AT 1, 1 TO 24, 80 PUT "FWBU"
 AT 2, 5 PUT "Yearly Maintenance (Herbicides)"
 AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
 AT 4, 5 PUT "Key Name" WITH "L"
 AT 5, 5 PUT "Site Code" WITH "L"
 AT 6, 5 PUT "Test Code" WITH "L"
 AT 7, 5 PUT "Treatment Code" WITH "L"
 AT 8, 5 PUT "Calendar Year" WITH "L"
 AT 9, 5 PUT "Growth Year" WITH "L"
 AT 10, 5 PUT "Rotation" WITH "L"
 AT 11, 5 PUT "Month Applied" WITH "L"
 AT 12, 5 PUT "Herbicide Name" WITH "L"
 AT 13, 5 PUT "General Type" WITH "L"
 AT 14, 5 PUT "Application Rate" WITH "L"
 AT 15, 5 PUT "Application Method" WITH "L"
 AT 16, 5 PUT "Estimated Cost per Hectare" WITH "L"
 AT 17, 5 PUT "Effectiveness" WITH "L"
 AT 18, 5 PUT "(G=good,F=fair,P=poor)" WITH "L"
 AT 19, 5 PUT "(for weed control)" WITH "L"
 AT 20, 5 PUT "Effect on Trees" WITH "L"
 AT 21, 5 PUT "(NO=no negative effect, SL=slight negative effect," WITH "L"
 AT 22, 5 PUT "UN=undetermined)" WITH "L"
 AT 3, 40 GET SUBNUM
 AT 3, 40 PUT SUBNUM
 AT 4, 40 GET KEYNAME
 AT 4, 40 PUT KEYNAME
 AT 5, 40 GET SITE
 AT 5, 40 PUT SITE
 AT 6, 40 GET TESTNAME
 AT 6, 40 PUT TESTNAME
 AT 7, 40 GET TREATMNT
 AT 7, 40 PUT TREATMNT
 AT 8, 40 GET CALENYR
 AT 8, 40 PUT CALENYR
 AT 9, 40 GET GROWTHYR
 AT 9, 40 PUT GROWTHYR
 AT 10, 40 GET ROTATION
 AT 10, 40 PUT ROTATION
 AT 11, 40 GET HBMONTH
 AT 11, 40 PUT HBMONTH
 AT 12, 40 GET HERBNAME
 AT 12, 40 PUT HERBNAME
 AT 13, 40 GET HERBTYPE
 AT 13, 40 PUT HERBTYPE

AT 14, 40 GET HBAPPLRT
 AT 14, 40 PUT HBAPPLRT
 AT 15, 40 GET HBAPPLMD
 AT 15, 40 PUT HBAPPLMD
 AT 16, 40 GET HBESTCST
 AT 16, 40 PUT HBESTCST
 AT 17, 40 GET HBEFTV
 AT 17, 40 PUT HBEFTV
 AT 20, 40 GET HBEFCTRE
 AT 20, 40 PUT HBEFCTRE

ENDFORM

SOURCE CODE OF FORM FOR YEARLY MAINTENANCE (FERTILIZER)
FILE

FORM YRMNTFT

AT 1, 1 TO 24, 80 PUT "FWBU"
 AT 2, 5 PUT "Yearly Maintenance (Fertilizer)"
 AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
 AT 4, 5 PUT "Key Name" WITH "L"
 AT 5, 5 PUT "Site Code" WITH "L"
 AT 6, 5 PUT "Test Code" WITH "L"
 AT 7, 5 PUT "Treatment Code" WITH "L"
 AT 8, 5 PUT "Calendar Year" WITH "L"
 AT 9, 5 PUT "Growth Year" WITH "L"
 AT 10, 5 PUT "Rotation" WITH "L"
 AT 11, 5 PUT "Month Applied" WITH "L"
 AT 12, 5 PUT "%N" WITH "L"
 AT 13, 5 PUT "%P" WITH "L"
 AT 14, 5 PUT "%K" WITH "L"
 AT 15, 5 PUT "Application Method" WITH "L"
 AT 16, 5 PUT "Total Amount (kg/ha)" WITH "L"
 AT 17, 5 PUT "Soil Fertility Effect" WITH "L"
 AT 18, 5 PUT "(improved, maintained" WITH "L"
 AT 19, 5 PUT "degraded, undetermined)" WITH "L"
 AT 3, 40 GET SUBNUM
 AT 3, 40 PUT SUBNUM
 AT 4, 40 GET KEYNAME
 AT 4, 40 PUT KEYNAME
 AT 5, 40 GET SITE
 AT 5, 40 PUT SITE
 AT 6, 40 GET TESTNAME
 AT 6, 40 PUT TESTNAME
 AT 7, 40 GET TREATMNT
 AT 7, 40 PUT TREATMNT
 AT 8, 40 GET CALENYR
 AT 8, 40 PUT CALENYR
 AT 9, 40 GET GROWTHYR
 AT 9, 40 PUT GROWTHYR
 AT 10, 40 GET ROTATION

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AT 10, 40 PUT ROTATION
AT 11, 40 GET FTMONTH
AT 11, 40 PUT FTMONTH
AT 12, 40 GET FTN
AT 12, 40 PUT FTN
AT 13, 40 GET FTP
AT 13, 40 PUT FTP
AT 14, 40 GET FTK
AT 14, 40 PUT FTK
AT 15, 40 GET FTAPPLMD
AT 15, 40 PUT FTAPPLMD
AT 16, 40 GET FTAMT
AT 16, 40 PUT FTAMT
AT 17, 40 GET FTEFFECT
AT 17, 40 PUT FTEFFECT

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ENDFORM

SOURCE CODE OF FORM FOR YEARLY MAINTENANCE (PEST CONTROL)
FILE

FORM YRMNTPC

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AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Yearly Maintenance (Pest Controls)"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Treatment Code" WITH "L"
AT 8, 5 PUT "Calendar Year" WITH "L"
AT 9, 5 PUT "Growth Year" WITH "L"
AT 10, 5 PUT "Rotation" WITH "L"
AT 11, 5 PUT "Month Applied" WITH "L"
AT 12, 5 PUT "Control Substance" WITH "L"
AT 13, 5 PUT "Effectiveness *" WITH "L"
AT 14, 5 PUT "(G=good,F=fair,P=poor)" WITH "L"
AT 15, 5 PUT "Application Method" WITH "L"
AT 17, 5 PUT "* for insect or disease control" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET TESTNAME
AT 6, 40 PUT TESTNAME
AT 7, 40 GET TREATMNT
AT 7, 40 PUT TREATMNT
AT 8, 40 GET CALENYR
AT 8, 40 PUT CALENYR
AT 9, 40 GET GROWTHYR

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AT 9, 40 PUT GROWTHYR
 AT 10, 40 GET ROTATION
 AT 10, 40 PUT ROTATION
 AT 11, 40 GET PCMONTH
 AT 11, 40 PUT PCMONTH
 AT 12, 40 GET PCCTLSUB
 AT 12, 40 PUT PCCTLSUB
 AT 13, 40 GET PCEFTV
 AT 13, 40 PUT PCEFTV
 AT 15, 40 GET PCAPPLMD
 AT 15, 40 PUT PCAPPLMD

ENDFORM

SOURCE CODE OF FORM FOR YEARLY MAINTENANCE (CULTIVATION)
FILE

FORM YRMNTCT

AT 1, 1 TO 24, 80 PUT "FWBU"
 AT 2, 5 PUT "Yearly Maintenance (Cultivation)"
 AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
 AT 4, 5 PUT "Key Name" WITH "L"
 AT 5, 5 PUT "Site Code" WITH "L"
 AT 6, 5 PUT "Test Code" WITH "L"
 AT 7, 5 PUT "Treatment Code" WITH "L"
 AT 8, 5 PUT "Calendar Year" WITH "L"
 AT 9, 5 PUT "Growth Year" WITH "L"
 AT 10, 5 PUT "Rotation" WITH "L"
 AT 11, 5 PUT "Month" WITH "L"
 AT 12, 5 PUT "Method" WITH "L"
 AT 13, 5 PUT "Effectiveness" WITH "L"
 AT 14, 5 PUT "for weed control" WITH "L"
 AT 15, 5 PUT "(G=good,F=fair,P=poor)" WITH "L"
 AT 3, 40 GET SUBNUM
 AT 3, 40 PUT SUBNUM
 AT 4, 40 GET KEYNAME
 AT 4, 40 PUT KEYNAME
 AT 5, 40 GET SITE
 AT 5, 40 PUT SITE
 AT 6, 40 GET TESTNAME
 AT 6, 40 PUT TESTNAME
 AT 7, 40 GET TREATMNT
 AT 7, 40 PUT TREATMNT
 AT 8, 40 GET CALENYR
 AT 8, 40 PUT CALENYR
 AT 9, 40 GET GROWTHYR
 AT 9, 40 PUT GROWTHYR
 AT 10, 40 GET ROTATION
 AT 10, 40 PUT ROTATION
 AT 11, 40 GET CTMONTH
 AT 11, 40 PUT CTMONTH
 AT 12, 40 GET CTMETHOD

```

AT 12, 40 PUT CTMETHOD
AT 13, 40 GET CTEFTV
AT 13, 40 PUT CTEFTV

```

ENDFORM

SOURCE CODE OF FORM FOR YEARLY MAINTENANCE (MOWING)
FILE

FORM YRMNTMW

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Yearly Maintenance (Mowing)"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Treatment Code" WITH "L"
AT 8, 5 PUT "Calendar Year" WITH "L"
AT 9, 5 PUT "Growth Year" WITH "L"
AT 10, 5 PUT "Rotation" WITH "L"
AT 11, 5 PUT "Month" WITH "L"
AT 12, 5 PUT "Equipment" WITH "L"
AT 13, 5 PUT "Effectiveness for weed control" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET TESTNAME
AT 6, 40 PUT TESTNAME
AT 7, 40 GET TREATMNT
AT 7, 40 PUT TREATMNT
AT 8, 40 GET CALENYR
AT 8, 40 PUT CALENYR
AT 9, 40 GET GROWTHYR
AT 9, 40 PUT GROWTHYR
AT 10, 40 GET ROTATION
AT 10, 40 PUT ROTATION
AT 11, 40 GET MWMONTH
AT 11, 40 PUT MWMONTH
AT 12, 40 GET MWEQUIP
AT 12, 40 PUT MWEQUIP
AT 13, 40 GET MWEFTV
AT 13, 40 PUT MWEFTV
AT 14, 5 PUT "(G=good,F=fair,P=poor)" WITH "L"

```

ENDFORM

SOURCE CODE OF FORM FOR YEARLY MAINTENANCE (BROWSE

CONTROL) FILE

FORM YRMNTBC

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Yearly Maintenance (Browsing Control)"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Treatment Code" WITH "L"
AT 8, 5 PUT "Calendar Year" WITH "L"
AT 9, 5 PUT "Growth Year" WITH "L"
AT 10, 5 PUT "Rotation" WITH "L"
AT 11, 5 PUT "Method" WITH "L"
AT 12, 5 PUT "Effectiveness" WITH "L"
AT 13, 5 PUT "(G=good,F=fair,P=poor)" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET TESTNAME
AT 6, 40 PUT TESTNAME
AT 7, 40 GET TREATMNT
AT 7, 40 PUT TREATMNT
AT 8, 40 GET CALENYR
AT 8, 40 PUT CALENYR
AT 9, 40 GET GROWTHYR
AT 9, 40 PUT GROWTHYR
AT 10, 40 GET ROTATION
AT 10, 40 PUT ROTATION
AT 11, 40 GET BCMETHOD
AT 11, 40 PUT BCMETHOD
AT 12, 40 GET BCEFTV
AT 12, 40 PUT BCEFTV

```

ENDFORM

SOURCE CODE OF FORM FOR YEARLY MAINTENANCE (IRRIGATION)
FILE

FORM YRMNTIR

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Yearly Maintenance (Irrigation)"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Treatment Code" WITH "L"
AT 8, 5 PUT "Calendar Year" WITH "L"

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AT 9, 5 PUT "Growth Year" WITH "L"
 AT 10, 5 PUT "Rotation" WITH "L"
 AT 11, 5 PUT "Irrigation Method (select one)"
 AT 12, 7 PUT "1) spray" WITH "L"
 AT 13, 7 PUT "2) drip" WITH "L"
 AT 14, 7 PUT "3) other" WITH "L"
 AT 15, 5 PUT "Irrigation Water Source (select one)"
 AT 16, 7 PUT "1) river/lake/pond water" WITH "L"
 AT 17, 7 PUT "2) well water" WITH "L"
 AT 18, 7 PUT "3) waste water" WITH "L"
 AT 19, 7 PUT "4) other" WITH "L"
 AT 20, 5 PUT "Total Amount Water Added/Year (liters)" WITH "L"

AT 21, 5 PUT "Soil Tension Maintained" WITH "L"
 AT 22, 5 PUT "Reliability of Irrigation Method" WITH "L"
 AT 23, 5 PUT "(G=good,F=fair,P=poor)" WITH "L"
 AT 3, 40 GET SUBNUM
 AT 3, 40 PUT SUBNUM
 AT 4, 40 GET KEYNAME
 AT 4, 40 PUT KEYNAME
 AT 5, 40 GET SITE
 AT 5, 40 PUT SITE
 AT 6, 40 GET TESTNAME
 AT 6, 40 PUT TESTNAME
 AT 7, 40 GET TREATMNT
 AT 7, 40 PUT TREATMNT
 AT 8, 40 GET CALENYR
 AT 8, 40 PUT CALENYR
 AT 9, 40 GET GROWTHYR
 AT 9, 40 PUT GROWTHYR
 AT 10, 40 GET ROTATION
 AT 10, 40 PUT ROTATION
 AT 11, 45 GET IRGNMTHD
 AT 11, 45 PUT IRGNMTHD
 AT 15, 45 GET IRGNWS
 AT 15, 45 PUT IRGNWS
 AT 20, 45 GET AMTWATER
 AT 20, 45 PUT AMTWATER
 AT 21, 45 GET SOILTENS
 AT 21, 45 PUT SOILTENS
 AT 22, 45 GET IRGNRELI
 AT 22, 45 PUT IRGNRELI

ENDFORM

SOURCE CODE OF FORM FOR YEARLY MAINTENANCE (LIME) FILE

FORM YRMNTLM

AT 1, 1 TO 24, 80 PUT "FWBU"
 AT 2, 5 PUT "Yearly Maintenance (Liming)"
 AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
 AT 4, 5 PUT "Key Name" WITH "L"

AT 5, 5 PUT "Site Code" WITH "L"
 AT 6, 5 PUT "Test Code" WITH "L"
 AT 7, 5 PUT "Treatment Code" WITH "L"
 AT 8, 5 PUT "Calendar Year" WITH "L"
 AT 9, 5 PUT "Growth Year" WITH "L"
 AT 10, 5 PUT "Rotation" WITH "L"
 AT 11, 5 PUT "Month Applied" WITH "L"
 AT 3, 40 GET SUBNUM
 AT 3, 40 PUT SUBNUM
 AT 4, 40 GET KEYNAME
 AT 4, 40 PUT KEYNAME
 AT 5, 40 GET SITE
 AT 5, 40 PUT SITE
 AT 6, 40 GET TESTNAME
 AT 6, 40 PUT TESTNAME
 AT 7, 40 GET TREATMNT
 AT 7, 40 PUT TREATMNT
 AT 8, 40 GET CALENYR
 AT 8, 40 PUT CALENYR
 AT 9, 40 GET GROWTHYR
 AT 9, 40 PUT GROWTHYR
 AT 10, 40 GET ROTATION
 AT 10, 40 PUT ROTATION
 AT 11, 40 GET LMMONTH
 AT 11, 40 PUT LMMONTH
 AT 12, 5 PUT "Application Method" WITH "L"
 AT 12, 40 GET LMAPPLMD
 AT 12, 40 PUT LMAPPLMD
 AT 13, 5 PUT "Total Amount (kg/ha)" WITH "L"
 AT 13, 40 GET LMAMT
 AT 13, 40 PUT LMAMT
 AT 14, 5 PUT "Soil Fertility Effect" WITH "L"
 AT 14, 40 GET LMEFFECT
 AT 14, 40 PUT LMEFFECT
 AT 15, 5 PUT "(improved, maintained" WITH "L"
 AT 16, 5 PUT "degraded, undetermined)" WITH "L"

ENDFORM

SOURCE CODE OF FORM FOR YEARLY MEASUREMENT INFORMATION
FILE

FORM YRMSMTN1

AT 1, 1 TO 24, 80 PUT "FWBU"
 AT 2, 5 PUT "Yearly Measurement Information"
 AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
 AT 4, 5 PUT "Key Name" WITH "L"
 AT 5, 5 PUT "Site Code" WITH "L"
 AT 6, 5 PUT "Test Code" WITH "L"
 AT 7, 5 PUT "Treatment Code" WITH "L"
 AT 8, 5 PUT "Calendar Year" WITH "L"
 AT 9, 5 PUT "Growth Year" WITH "L"

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AT 10, 5 PUT "Rotation" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET TESTNAME
AT 6, 40 PUT TESTNAME
AT 7, 40 GET TREATMNT
AT 7, 40 PUT TREATMNT
AT 8, 40 GET CALENYR
AT 8, 40 PUT CALENYR
AT 9, 40 GET GROWTHYR
AT 9, 40 PUT GROWTHYR
AT 10, 40 GET ROTATION
AT 10, 40 PUT ROTATION
AT 11, 5 PUT "Height Data (yes or no)" WITH "L"
AT 11, 40 GET HGTDATA
AT 11, 40 PUT HGTDATA
AT 12, 5 PUT "Breast Diameter Data (yes or no)" WITH "L"
AT 12, 40 GET DBH
AT 12, 40 PUT DBH
AT 13, 5 PUT "Base Diameter Data (yes or no)" WITH "L"
AT 13, 40 GET DIAMBASE
AT 13, 40 PUT DIAMBASE
AT 14, 5 PUT "Month Collected" WITH "L"
AT 14, 40 GET MEASMNTH
AT 14, 40 PUT MEASMNTH
AT 15, 5 PUT "Number of Replicates Measured" WITH "L"
AT 15, 40 GET MEASREPN
AT 15, 40 PUT MEASREPN
AT 16, 5 PUT "Number Trees/Rep Measured" WITH "L"
AT 16, 40 GET MEASTREN
AT 16, 40 PUT MEASTREN
AT 17, 5 PUT "Percent Sprouts/Tree Measured" WITH "L"
AT 17, 40 GET MEASSPRT
AT 17, 40 PUT MEASSPRT

```

ENDFORM

SOURCE CODE OF FORM FOR YEARLY HARVEST INFORMATION
FILE

FORM YRHARVIN

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Yearly Harvest Information"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Treatment Code" WITH "L"

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AT 8, 5 PUT "Calendar Year" WITH "L"
 AT 9, 5 PUT "Growth Year" WITH "L"
 AT 10, 5 PUT "Rotation" WITH "L"
 AT 11, 5 PUT "Wet Weight (yes or no)" WITH "L"
 AT 12, 5 PUT "Total Replicate Harvested (yes or no)" WITH "L"
 L" AT 13, 5 PUT "Replicate Subplot Harvested (yes or no)" WITH "
 AT 14, 5 PUT "Number of Replicates Harvested" WITH "L"
 AT 15, 5 PUT "Number Trees/Rep Harvested" WITH "L"
 AT 16, 5 PUT "Individual Trees Weighed (yes or no)" WITH "L"
 AT 17, 5 PUT "Trees Bulk-Weighed (yes or no)" WITH "L"
 AT 18, 5 PUT "Leaves Included (yes or no)" WITH "L"
 AT 20, 5 PUT "Reference report and page, describing how dry we
 ight estimates" WITH "L"
 AT 21, 5 PUT "were made, including equations used." WITH "L"
 AT 3, 40 GET SUBNUM
 AT 3, 40 PUT SUBNUM
 AT 4, 40 GET KEYNAME
 AT 4, 40 PUT KEYNAME
 AT 5, 40 GET SITE
 AT 5, 40 PUT SITE
 AT 6, 40 GET TESTNAME
 AT 6, 40 PUT TESTNAME
 AT 7, 40 GET TREATMNT
 AT 7, 40 PUT TREATMNT
 AT 8, 40 GET CALENYR
 AT 8, 40 PUT CALENYR
 AT 9, 40 GET GROWTHYR
 AT 9, 40 PUT GROWTHYR
 AT 10, 40 GET ROTATION
 AT 10, 40 PUT ROTATION
 AT 11, 50 GET WETWGT
 AT 11, 50 PUT WETWGT
 AT 12, 50 GET TOTREPHV
 AT 12, 50 PUT TOTREPHV
 AT 13, 50 GET REPSUBHV
 AT 13, 50 PUT REPSUBHV
 AT 14, 50 GET NUMREPHV
 AT 14, 50 PUT NUMREPHV
 AT 15, 50 GET NUMTREHV
 AT 15, 50 PUT NUMTREHV
 AT 16, 50 GET INDTREEW
 AT 16, 50 PUT INDTREEW
 AT 17, 50 GET TREEBLKW
 AT 17, 50 PUT TREEBLKW
 AT 18, 50 GET LEAVES
 AT 18, 50 PUT LEAVES
 AT 22, 17 GET REFRPTPG
 AT 22, 17 PUT REFRPTPG

ENDFORM

SOURCE CODE OF FORM FOR YEARLY HARVEST METHODS FILE

FORM YRHARVMD

```

AT 1, 1 TO 25, 80 PUT "FWBU"
AT 2, 5 PUT "Yearly Harvest Methods"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Treatment Code" WITH "L"
AT 8, 5 PUT "Calendar Year" WITH "L"
AT 9, 5 PUT "Growth Year" WITH "L"
AT 10, 5 PUT "Rotation" WITH "L"
AT 11, 5 PUT "Month" WITH "L"
AT 12, 5 PUT "Method of Cut (select one)"
AT 13, 7 PUT "1. manual (chain saw, brush cutter)" WITH "L"
AT 14, 7 PUT "2. mechanical (but individual trees)" WITH "L"
AT 15, 7 PUT "3. prototype (multiple tree harvester)" WITH "L"
"
L"
AT 16, 7 PUT "4. commercial (multiple tree harvester)" WITH "
AT 17, 7 PUT "5. other" WITH "L"
AT 18, 5 PUT "Method of Removal (select one)"
AT 19, 7 PUT "1. manual skidding" WITH "L"
AT 20, 7 PUT "2. grapple skidder" WITH "L"
AT 21, 7 PUT "3. other" WITH "L"
AT 22, 5 PUT "Average Stump Height (cm)" WITH "L"
AT 23, 5 PUT "Average Stump Angle (degrees)" WITH "L"
AT 24, 5 PUT "Average Stump Diameter (cm)" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET TESTNAME
AT 6, 40 PUT TESTNAME
AT 7, 40 GET TREATMNT
AT 7, 40 PUT TREATMNT
AT 8, 40 GET CALENYR
AT 8, 40 PUT CALENYR
AT 9, 40 GET GROWTHYR
AT 9, 40 PUT GROWTHYR
AT 10, 40 GET ROTATION
AT 10, 40 PUT ROTATION
AT 11, 40 GET MONTH
AT 11, 40 PUT MONTH
AT 12, 40 GET CUTMTHD
AT 12, 40 PUT CUTMTHD
AT 18, 40 GET RMVMTHD

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AT 18, 40 PUT RMVMTHD
AT 22, 40 GET AVGSTHGT
AT 22, 40 PUT AVGSTHGT
AT 23, 40 GET AVGSTANG
AT 23, 40 PUT AVGSTANG
AT 24, 40 GET AVGSTDIA
AT 24, 40 PUT AVGSTDIA
AT 25, 5 PUT "Percent Stumps Damaged" WITH "L"
AT 25, 40 GET PTSTPDMG
AT 25, 40 PUT PTSTPDMG

```

ENDFORM

SOURCE CODE OF FORM FOR YEARLY YIELD BY TEST FILE

FORM YRYLDTST

```

AT 1, 1 TO 24, 80 PUT "FWBU"
AT 2, 5 PUT "Yearly Biomass Yields Per Test"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Calendar Year" WITH "L"
AT 8, 5 PUT "Growth Year" WITH "L"
AT 9, 5 PUT "Rotation" WITH "L"
AT 10, 5 PUT "Percent Survival of Select Provenances, Conditions etc." WITH "L"
AT 11, 5 PUT "Biomass Yield (Mg/ha) of Select Group" WITH "L"
AT 12, 5 PUT "Standard Deviation (Mg/ha) Between Reps of Select Group" WITH "L"
AT 13, 5 PUT "Percent Survival of All Provenances, Conditions etc." WITH "L"
AT 14, 5 PUT "Biomass Yield (Mg/ha) of All Provenances, Conditions in Test" WITH "L"
AT 15, 5 PUT "Standard Deviation (Mg/ha) Between Reps Including All Groups" WITH "L"
AT 16, 5 PUT "Biomass Yield (Mg/ha) of Control " WITH "L"
AT 18, 5 PUT "Please describe Select Group"
AT 22, 5 PUT "Please describe Control Data"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET TESTNAME
AT 6, 40 PUT TESTNAME
AT 7, 40 GET CALENYR
AT 7, 40 PUT CALENYR
AT 8, 40 GET GROWTHYR
AT 8, 40 PUT GROWTHYR
AT 9, 40 GET ROTATION

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AT 9, 40 PUT ROTATION
AT 10, 65 GET SELECSR
AT 10, 65 PUT SELECSR
AT 11, 65 GET SELECYLD
AT 11, 65 PUT SELECYLD
AT 12, 65 GET SELYLDS
AT 12, 65 PUT SELYLDS
AT 13, 65 GET ALLSRV
AT 13, 65 PUT ALLSRV
AT 14, 65 GET ALLYLD
AT 14, 65 PUT ALLYLD
AT 15, 65 GET ALLYLDS
AT 15, 65 PUT ALLYLDS
AT 16, 65 GET CONTRYLD
AT 16, 65 PUT CONTRYLD
AT 20, 10 GET SELECTGP
AT 20, 10 PUT SELECTGP
AT 24, 10 GET CONTROL
AT 24, 10 PUT CONTROL

```

ENDFORM

SOURCE CODE OF FORM FOR YEARLY YIELD BY TREATMENT FILE

FORM YRYLDTRT

```

AT 1, 1 TO 25, 80 PUT "FWBU"
AT 2, 5 PUT "Yearly Biomass Yields Per Treatment"
AT 3, 5 PUT "Subcontract or Grant Number" WITH "L"
AT 4, 5 PUT "Key Name" WITH "L"
AT 5, 5 PUT "Site Code" WITH "L"
AT 6, 5 PUT "Test Code" WITH "L"
AT 7, 5 PUT "Treatment Code" WITH "L"
AT 8, 5 PUT "Calendar Year" WITH "L"
AT 9, 5 PUT "Growth Year" WITH "L"
AT 10, 5 PUT "Rotation" WITH "L"
AT 11, 5 PUT "Percent Survival" WITH "L"
AT 12, 5 PUT "Biomass Yield (Mg/ha)"
AT 13, 7 PUT "Standard Deviation (Mg/ha)"
AT 14, 5 PUT "Reasons for Lower-Than-Expected Yield (mark any
with an X)"
AT 15, 7 PUT "1. species off-site" WITH "L"
AT 16, 7 PUT "2. drought" WITH "L"
AT 17, 7 PUT "3. flooding" WITH "L"
AT 18, 7 PUT "4. poor quality planting stock" WITH "L"
AT 19, 7 PUT "5. poor site preparation" WITH "L"
AT 20, 7 PUT "6. weed competition" WITH "L"
AT 21, 7 PUT "7. insect pests" WITH "L"
AT 22, 7 PUT "8. disease problems" WITH "L"
AT 23, 7 PUT "9. animal browse" WITH "L"
AT 3, 40 GET SUBNUM
AT 3, 40 PUT SUBNUM
AT 4, 40 GET KEYNAME

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```
AT 4, 40 PUT KEYNAME
AT 5, 40 GET SITE
AT 5, 40 PUT SITE
AT 6, 40 GET TESTNAME
AT 6, 40 PUT TESTNAME
AT 7, 40 GET TREATMNT
AT 7, 40 PUT TREATMNT
AT 8, 40 GET CALENYR
AT 8, 40 PUT CALENYR
AT 9, 40 GET GROWTHYR
AT 9, 40 PUT GROWTHYR
AT 10, 40 GET ROTATION
AT 10, 40 PUT ROTATION
AT 11, 40 GET PCTSURV
AT 11, 40 PUT PCTSURV
AT 12, 40 GET BIOYIELD
AT 12, 40 PUT BIOYIELD
AT 13, 40 GET STDDEV
AT 13, 40 PUT STDDEV
AT 15, 40 GET OFFSITE
AT 15, 40 PUT OFFSITE
AT 16, 40 GET DROUGHT
AT 16, 40 PUT DROUGHT
AT 17, 40 GET FLOODING
AT 17, 40 PUT FLOODING
AT 18, 40 GET POORSTOK
AT 18, 40 PUT POORSTOK
AT 19, 40 GET POORSITE
AT 19, 40 PUT POORSITE
AT 20, 40 GET WEEDCOMP
AT 20, 40 PUT WEEDCOMP
AT 21, 40 GET INSECTS
AT 21, 40 PUT INSECTS
AT 22, 40 GET DISEASE
AT 22, 40 PUT DISEASE
AT 23, 40 GET BROWZE
AT 23, 40 PUT BROWZE
AT 24, 7 PUT "10. other" WITH "L"
AT 24, 20 GET OTHERPRB
AT 24, 20 PUT OTHERPRB
AT 25, 5 PUT "Moisture Content" WITH "L"
AT 25, 22 GET MOISTURE
AT 25, 22 PUT MOISTURE
AT 25, 40 PUT "Specific Gravity" WITH "L"
AT 25, 57 GET SPECGRAV
AT 25, 57 PUT SPECGRAV
```

ENDFORM

SOURCE CODE OF BROWSE AND CREATE MODE FORMS

```
Form brows at 1,60 to 1,74 put "fwbr"  
          at 1,62 put "Browse Mode"  
Endform  
Form creat at 1,60 to 1,74 put "fwbr"  
          at 1,62 put "Create Mode"  
Endform
```

6.4 REFERENCES

1. DeMarco, T. "Structured Analysis and System Specification." New York: Prentice-Hall, 1979.
2. "KNOWLEDGEMAN Technical Reference Manual", Micro Data Base Systems, Inc. (1984).
3. Martin, J. "Computer Data-Base Organization, 2nd Edition." New Jersey: Prentice-Hall, 1977.

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