



FIELD REFERENCE GUIDE
NOTE TAKING



HarvestMaster[®]

Field Research Software™

Note Taking



Reference Guide

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CHAPTER 1
INTRODUCTION

About Field Research Software™ (FRS)

Using this reference guide

Contact us

Introduction



About Field Research Software (FRS) Note Taking™

Designed by seed researchers, this modular software helps seed researchers and agricultural scientists easily perform data collection tasks on research field plots using handheld devices including the Allegro Field PC®, Mesa® Rugged Notepad and other handheld computers.

Note Taking

This manual is about the FRS Note Taking™ module (referred to in this reference guide as “FRS”). FRS Note Taking™ is the core of the Field Research Software™. It allows you to create a map corresponding to a field or download field information from your own research software. The navigation feature keeps track of your location as you walk and collect data within a field.

Harvest Modules

FRS Plot Harvest Data™ modules for our High Capacity GrainGage™, Classic GrainGage™, and regular bucket systems can be added to the core FRS system.

With FRS, you can:

- Import map information including range, row, and pedigree from research management software
- Export and merge data collected in CSV format into research management software
- View pedigree or previously collected data on a handheld device
- Create maps or traits directly on a handheld
- Adjust navigation patterns on the go
- Review field maps, plot data, and plot locations using multiple views

Features:

- Spatial view for identifying current location and reviewing previously collected data
- Form view for quick and easy data entry
- List view or spreadsheet layout with sort order based on navigation pattern
- All data visible on a single plot
- Information about multiple plots available simultaneously
- Auto date feature for collecting flowering or maturity notes
- Interface to bar code scanners and electronic scales
- Flexible application to fit markets where materials are placed in a grid layout

Chapter 1

The FRS database application allows for easy data retrieval, sorting, and viewing. Once data are collected in the field, they are easily transferred to the desktop database for analyzing, reporting, and archiving.

FRS has Windows® functionality with touchscreen and keyboard data entry. It runs on the Allegro Field PC® and the Mesa Rugged Notepad.

Using this Reference Guide

This field reference guide is designed to help you prepare to collect data. The steps below show you what to do before collecting data and where to find instructions in this guide to complete each step. Refer to the index for further reference information.

<i>Step</i>	<i>Task</i>	<i>Reference</i>
1	Install and register FRS.	Chapter 2
2	Become familiar with the FRS main screen, keyboard uses, and soft keys.	Chapter 3
3	Learn about the FRS main screen.	Chapter 4
4	Manage the devices used, define standard units, set personal preferences, manage trait lists and templates.	Chapter 5
5	Create or import a trait list.	Chapter 5 (Create) Chapter 7 (Import)

<i>Step</i>	<i>Task</i>	<i>Reference</i>
6	Add trait templates.	Chapter 5
7	Create a field map.	Chapter 6
8	Import or export a field map	Chapter 7
9	Select a field map and trait template on the main FRS screen.	Chapter 8
10	Select a navigation type and direction.	Chapter 8
11	Select a new data collection form or list of data collection screens	Chapter 8
12	Collect data.	Chapter 8

Contact Us

If you have any questions or comments about FRS, please feel free to contact our Service Department at (435) 753-1881, or visit our website at www.harvestmaster.com.

Chapter 1



CHAPTER 2

GETTING STARTED

Installing the program

Registering your copy of FRS™

Using FRS in demo mode

Getting Started



In this chapter, you learn how to install and register FRS.

Installing the program

To install FRS to a handheld computer, follow these steps:

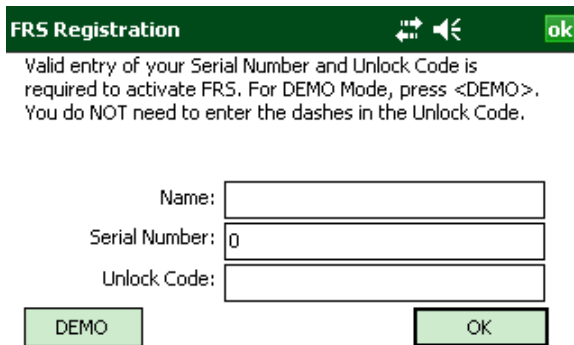
1. Visit www.harvestmaster.com to download the latest version.
2. Download the FRS Note Taking.exe file, making sure you select the correct version of the software for your handheld OS (e.g. Allegro CX or Allegro MX).
3. Make an ActiveSync® (XP) or Windows Mobile Device Center® (Vista/7) connection between your handheld and PC.
4. Run FRS Note Taking setup on PC.
5. Choose installation location on PC.
6. Choose **Yes** to allow program to install in default location on handheld.
7. Give it a minute or two to download onto your handheld.
8. Run FRS on handheld.
9. Enter name and previously obtained, Serial #, and Registration Key.

Note: The application may take a few seconds to open while it builds the database.

Registering your copy of FRS

FRS is a licensed application and requires a serial number and registration key to activate the program. The serial number and registration key are valid for one installation on one handheld. Additional licenses can be purchased from the manufacturer.

When you run FRS for the first time, a registration screen appears, asking for the following information:



FRS Registration ⏪ ⏩ 🔊 ok

Valid entry of your Serial Number and Unlock Code is required to activate FRS. For DEMO Mode, press <DEMO>. You do NOT need to enter the dashes in the Unlock Code.

Name:

Serial Number:

Unlock Code:

Figure 2-1: FRS registration screen

- **Name.** The Name text field is used to identify who purchased the program. Enter the name of an individual or company.
- **Serial number.** Enter the serial number found on the registration card.

- **Unlock Code.** The Unlock Code is also on the registration card.

After you have entered the required information, tap the **OK** key. FRS is now fully installed and registered on your handheld device.

Note: If you have installed FRS onto an Allegro CX Field PC, you must perform a Save System on your handheld before you begin using the application. To save the system, tap **Start** > **Programs** > **Utilities** > **Save System**.



Figure 2-2: Save System screen

Using FRS in demo mode

You can run FRS in demo mode by tapping DEMO on the registration screen. In demo mode, data cannot be exported from the application. For best results, please be sure to register FRS before using it.

CHAPTER 3

BECOMING FAMILIAR WITH THE PROGRAM

Accessing the main FRS screen

Navigating FRS using a field computer with a full keyboard

Navigate FRS using a field computer with a PDA-type keyboard

Using FRS soft keys

Becoming Familiar with the Program

This chapter explains how to

- Access the main FRS screen
- Navigate FRS using a field computer with a full keyboard
- Navigate FRS using a field computer with a PDA-type keyboard
- Use the FRS soft keys

Accessing the main FRS screen

To enter the FRS application for the first time, follow these steps:

1. Tap the FRS icon on the desktop, or select FRS from the **Start** menu. The FRS main screen appears (Fig. 3-1).



Figure 3-1: FRS main screen in NoteTaking

Note: The FRS application is designed to run in landscape mode. If your device does not rotate the software to appear in landscape mode automatically, rotate the screen to landscape. (See the handheld user’s guide.)

Note: To place FRS on the Start Menu of a Windows Mobile device, tap on **Start > Settings > Personal > Menus** and then check the box for FRS.

Navigating FRS using a field computer with a full keyboard

If you are using a handheld with a full keyboard, the following section explains how to use your keyboard to navigate FRS.

Enter key

Press the **Enter** key to accept data or settings.

Function keys

If you are using an Allegro Field PC, you can use the function keys on the keyboard to access the corresponding soft keys at the bottom of the display. See Figure 3-2.

Key	Function in the main FRS screen	Soft key label	Key	Function in the main FRS screen	Soft key label
F1	Collect data	Collect	F4	Diagnostics	Diag
F2	Field maps	Maps	F5	Exit program	Exit
F3	Setup	Setup			

Figure 3-2: Purposes of each function key in the main FRS screen

Chapter 3

Arrow keys

Arrow keys serve different functions in different screens. In the Setup screen, arrows keys allow you to move up and down the menu or open and close selected folders and files (see Chapter 5). In Collect Data screens, arrow keys move the cursor around to different cells (see Chapter 8).

Escape key

The Escape key allows you to cancel a function or escape out of a screen without saving changes.

Tab key

Use this key to advance to the next field or function. If your tab key has a left tab option, you can back tab.

For instructions about using the soft keys on the display, see the next section, *Navigating FRS using soft keys*.

Navigate FRS using a field computer with a PDA-type keyboard

Many handheld devices have a limited number of keys (see Figure 3-3). With such devices, you can access all of the software features by pressing the soft keys on the screen. This section describes how to use FRS relying mainly on the soft keys on the display.

Note: If your handheld has one or more of the following keys (function keys, arrow keys, Enter, Escape, or Tab) see the previous section, *Navigating FRS using a field computer with a full keyboard*, to learn how to use these keys.



Figure 3-3: Keyboard of a Mesa Rugged Notepad™

Using FRS soft keys

Each screen in FRS contains several soft key options. Below is an explanation of what each soft key does.

- **Close.** Found in the top right corner of most FRS screens, the X or OK allows you to return to the previous level of navigation, ultimately including exiting out of FRS. If you are collecting data, pressing the X or OK gives you an option to exit the data collection section of the software (Fig. 3-4). To exit data collection on the Allegro CX, press Esc.

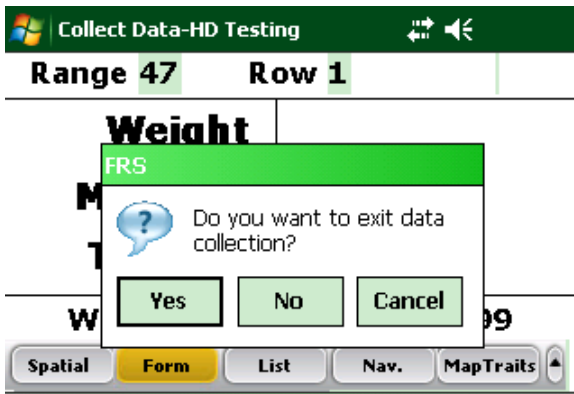


Figure 3-4: Exit data collection dialog box

- **Exit.** Press *Exit* (F5) on the Main screen (Fig. 3-5) closes the program and returns you to the desktop of the handheld.



Figure 3-5: Exit soft key on the main screen

Other soft keys appear at the bottom of the display in different screens. More instructions for using these keys are included in the following chapters.

Note: Information you enter in FRS is saved automatically.

You do not need to save it before exiting the program. If you choose to exit, FRS closes.



CHAPTER 4

UNDERSTANDING THE MAIN SCREEN

Main screen drop-down menus

Main screen soft keys

Understanding the Main Screen

The main screen of FRS acts as the main menu for the application. Choosing options from the three drop-down boxes prepares you to begin collecting data. Pressing one of the soft keys on the bottom of the screen lets you access different sections of the software.

This chapter describes the drop-down boxes and soft keys on the main FRS screen.



Figure 4-1: Main FRS screen

Main screen drop-down menus

The activity selection area is located on the right side of the main FRS screen (see Fig. 4-1). Here you find three drop-down menus. Each box is described below.

- **Activity.** The default activity for this menu is Note Taking. Other activities will be discussed in subsequent manuals.
- **Field Map.** The field map drop-down menu lets you select the field map you want to use to collect data. If you have not already created a field map, you can create one by pressing the **Maps** soft key or by pressing F2. (See Chapter 6 for more details). You can also import a map using the Import/Export Utility (see Chapter 7).
- **Trait Template.** Collect data efficiently by choosing a set of grouped traits (trait templates) from the drop-down menu. The software comes loaded with a set of pre-defined traits. Modify these traits or add your own traits to suit your research program. (For instructions on how to modify or add your own traits, see Chapter 5.)

Main screen soft keys

- The menu at the bottom of the screen offers five soft key options. The purpose of each key is described below.



Figure 4-2: Soft keys on the main FRS screen

- **Collect (F1).** Press this key to start collecting data. (For more details about collecting data, see Chapter 8.)

Chapter 4

- **Maps (F2).** Create and edit maps by pressing this key. (For more instructions, see Chapter 6, *Creating a Field Map*.)
- **Setup (F3).** Use this option to establish a manage devices, define units, set language and date preferences, edit master traits lists, and import and export data. (For more details about the Setup screen, see Chapter 5, *Understanding the Setup screen*.)
- **Diagnostics (F4).** Press this key to access hardware diagnostics (if available).
- **Exit (F5).** Press this key to exit FRS NoteTaking.



CHAPTER 5

UNDERSTANDING THE SETUP SCREEN

Navigating the Setup screen

System menu

Traits management menu

Soft keys on the Master Traits List screen

Selecting traits for a template

Understanding the Setup Screen

The Setup screen configures FRS to collect data based on your preferences. This chapter teaches you how to find and use options under the **System** and **Traits Management** headings on the Setup screen (Fig. 5-1). These options allow you to:

- Manage the devices used
- Define standard units
- Set personal preferences
- Manage trait lists and templates

Options under the **Database Tools** menu option are discussed in Chapters 7 and 9.

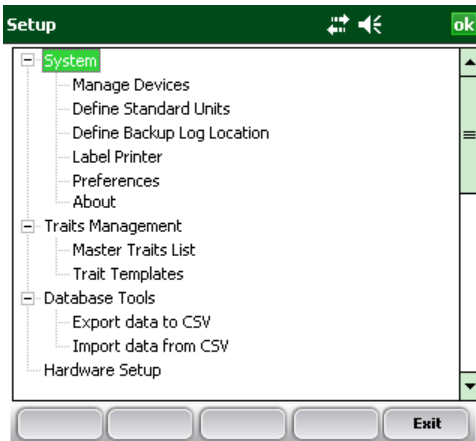


Figure 5-1: Setup screen

Navigating the Setup screen

To access the Setup screen, press **Setup** (F3) on the main FRS screen (Fig. 5-2).



Figure 5-2: Setup soft key on the main FRS screen

The Setup screen is designed as a collapsible menu tree (see Fig. 5-1). You can use your keyboard to navigate the menu:

- Use the left arrow on your keyboard to close subfolders.
- Use the right arrow to open subfolders.
- Use the up and down arrows to move through the menu.
- Press Enter or tap on menu headings to open menu options.

The handheld's screen is not capable of showing all the menus on the setup screen entirely extended. We have included below an image of all the setup menus extended if the screen were large enough to allow it (see Figure 5-3).

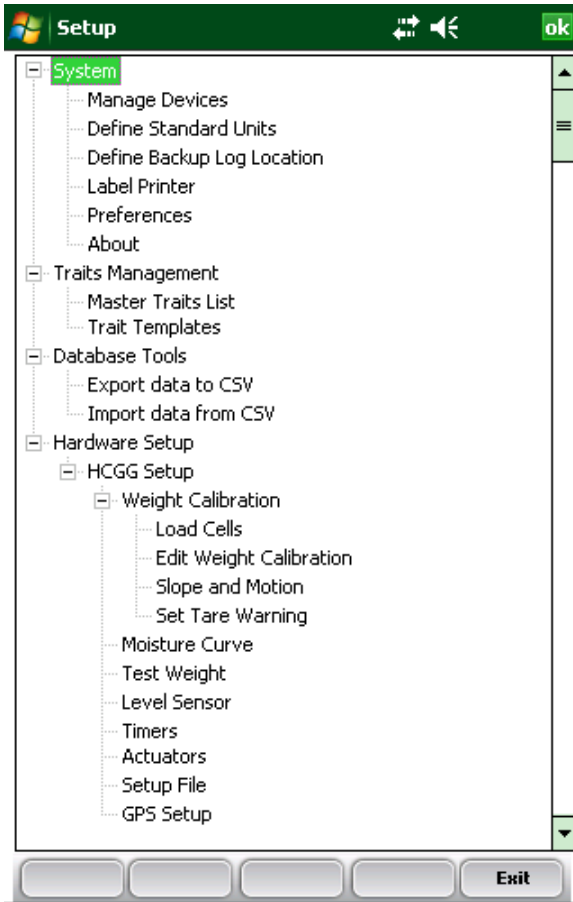


Figure 5-3: A image of the setup menus extended.

System and *Traits Management* options on the Setup screen are described in the following sections.

System menu

Six task options fall under the *System* menu on the Setup screen: **Manage Devices**, **Define Standard Units**, **Define Backup Log Location**, **Label Printer**, **Preferences**, and **About** (Fig. 5-4). Each option is described below.

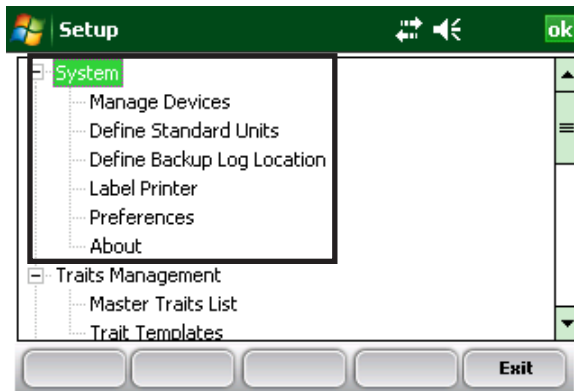


Figure 5-4: Options under the System menu

- **Manage Devices.** By tapping this menu item, you can enable a specific Harvest module (HCGG, Classic GG, GHM, etc.) in FRS Note Taking. It enables FRS Note Taking to control the specified weigh system.

Note: Only one device can be enabled at a time.

Press **Save** (F4) with nothing enabled.

Chapter 5

- **Define Standard Units.** This task option on the Setup screen allows you to set default units used for weight, volume, length (distance), and the number of places following a decimal.
- **Define Backup Log Location.** Select a path to set the location where the backup logs are to be saved.

Note: Changing the backup log location may make it more difficult to find backup log files.

- **Label Printer.** Setup COM ports, formatting and label size for a barcode printer.
- **Preferences.** Select the language and date options you prefer. If you change the language option, you need to close the program and start it again.
- **About.** Select this option to view the software version number and other important information about FRS.

Traits Management menu

There are two options under the Traits Management menu option on the Setup screen: Master Traits List and Trait Templates (See Fig. 5-7). Each option is described in this section.

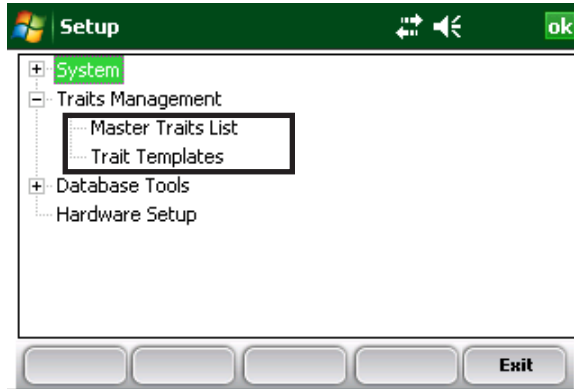


Figure 5-5: Traits Management options

Master Traits List

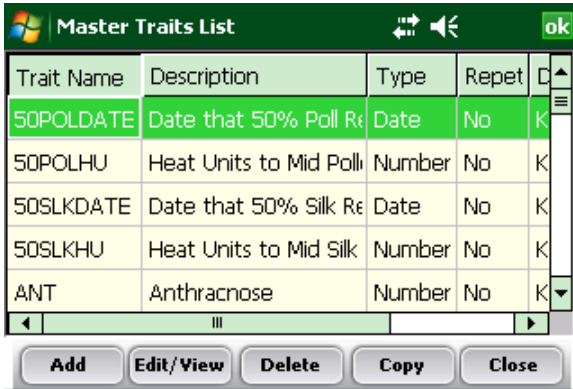
the first option is Master Traits List. FRS includes a Master Traits List with pre-defined traits. Tap the Master Traits List option to define the traits (types of data) you plan to collect throughout the year. Example traits include ground notes and data collected from a harvester (see the example in Figure 5-6).

You can modify these traits or add your own traits to suit your research program. To view or modify the existing Master Traits List, double-tap this option on the Setup screen (Fig. 5-5).

Important: Any changes you make to a trait in the Master Traits List or to existing templates do not change data you have collected or associated to a field map.

Soft keys on the Master Traits List screen

To edit, delete, or copy a trait, highlight the trait and press the appropriate soft key on the Master Traits List screen (Fig. 5-6). Each soft key is described below.



The screenshot shows a software window titled "Master Traits List" with a green header bar. The window contains a table with the following data:

Trait Name	Description	Type	Repet	D
50POLDATE	Date that 50% Poll R	Date	No	K
50POLHU	Heat Units to Mid Poll	Number	No	K
50SLKDATE	Date that 50% Silk R	Date	No	K
50SLKHU	Heat Units to Mid Silk	Number	No	K
ANT	Anthracnose	Number	No	K

Below the table is a navigation bar with five buttons: "Add", "Edit/View", "Delete", "Copy", and "Close". The "Add" button is highlighted in green.

Figure 5-6: Master Traits List screen

- **Add (F1).** Opens the Add/Edit Traits screen (Fig. 5-7). When this screen is opened with **Add** it allows you to create a trait to be used for data collection. For more details about the Add/Edit traits screen, see the section in this chapter called Elements on the **Add/Edit Traits screen**.

- **Edit/View (F2).** Opens the Add/Edit Traits screen (Fig. 5-7). Allows you to view and edit existing traits.

Important: Any changes you make to a trait in the master traits list or to existing templates will not affect data you have already collected or associated to a field map.

- **Delete (F3).** Deletes any highlighted traits.
- **Copy (F4).** Automatically creates a copy of a highlighted trait and opens the Add/Edit Traits screen for editing.
- **Close (F5).** Closes the window and returns you to the Setup screen.

Elements on the Add/Edit Traits screen

You can manage traits using the Add/Edit Traits screen (Fig. 5-7). For example, you can change a trait name or type. Elements of the Add/Edit Traits screen are described below.

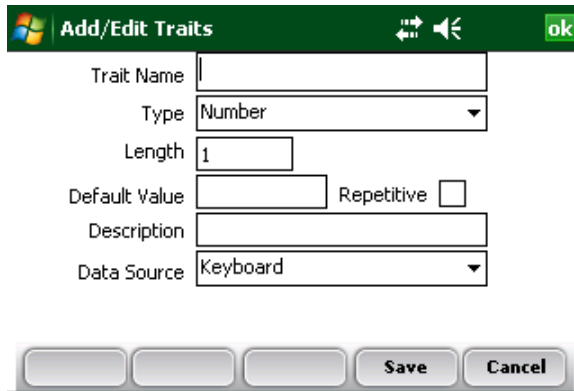


Figure 5-7: Add/Edit Traits screen

- **Trait Name.** The trait name helps you identify what trait is being collected. The trait name can be up to 20 characters long and can be a combination of letters or numbers. (We recommend creating a short trait name for easy viewing). **Trait names cannot contain the symbols / \ : * ? " < > | .**
- **Type.** A drop-down menu lets you choose from four data types:
 - Rating. A rating is a number or integer without a decimal place (Example: 212).
 - Number. A number has a decimal place (Example: 212.4).

Note: You can specify the number of digits after the decimal place by returning to the Setup screen and choosing **Define Standard Units**.

- Text. A text type trait is reserved for any alphanumeric set of characters (Example: A24).
- Date. A date trait is used to enter current data based on the date on your handheld computer. Select **Date** to enter flowering dates.
- **Length.** The length is the maximum number of characters allowed in a data value. The software automatically moves to the next trait field as soon as you enter the maximum number of characters. For example, if you set the data value length to three characters, the software moves automatically to the next field after you enter three characters.

Note: If your number includes a decimal, count the numbers before and after the decimal as part of the length; do not count the decimal. For example, a value of 55.55 would count as a length of four.

- **Default value.** The default value is the most common value you plan to use while you collect data. For example, if you plan to use ratings from one through nine and one is the most common value, enter one as the default value.

While you are collecting data, press the Enter key to automatically store the default value for that trait. If the default value is left blank, pressing enter while you are

taking notes leaves the trait null or blank and moves you to the next trait field.

- **Description.** A description helps you identify the type of trait. Create a description of a trait in the Add/Edit Traits screen (Fig. 5-7).
- **Data source.** By default, the Data Source option is Keyboard.
- **Repetitive.** Checking this box allows you to collect data on the same trait on different days. FRS inserts the current date automatically.

Trait Templates

The second option is trait templates. Choose this option from the Setup screen (Fig. 5-8). A trait template is used to select and group together certain traits from a master trait list. Typically, traits grouped within a trait template are collected at the same time during the year. For example, a harvest template might contain plot weight, moisture, and test weight traits.

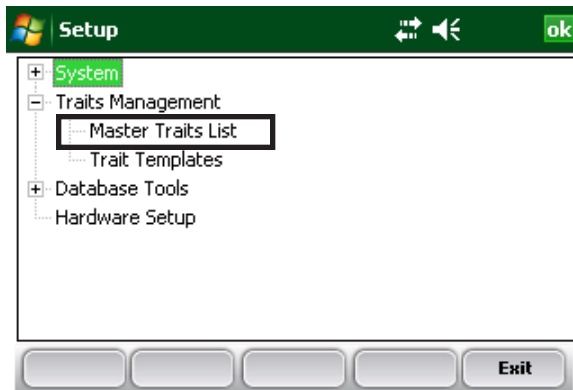
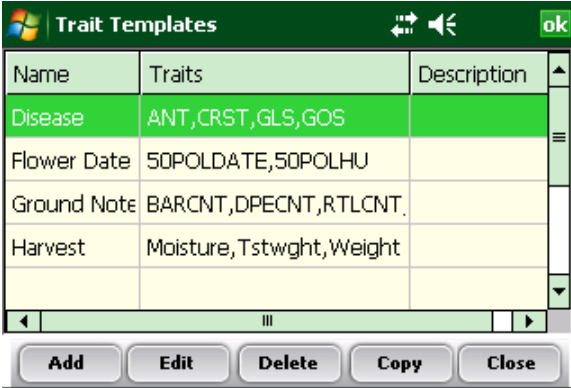


Figure 5-8: Trait Templates option

FRS provides three trait template examples: disease, flower date, and ground notes. You can create your own trait template or edit one of the templates provided.

One key feature of FRS is that you can use a single field map to collect data at different times of the year. Trait templates help manage or group traits collected at one time.

Trait templates can be managed from the Trait Templates screen (Fig. 5-9). Add, edit, delete, or copy templates from this screen using the soft keys at the bottom of the display. Each option is described in the next section.



Name	Traits	Description
Disease	ANT,CRST,GLS,GOS	
Flower Date	50POLDATE,50POLHU	
Ground Note	BARCNT,DPECNT,RTL CNT.	
Harvest	Moisture,Tstwgght,Weight	

Buttons: Add, Edit, Delete, Copy, Close

Figure 5-9: Trait Templates screen

Column headers at the top of the Trait Templates screen are Name, Traits, and Description (Fig. 5-9). The Traits column lists the traits you put in the template, and the Description column signifies how the template will be used.

Managing traits using the Trait Templates screen

Use the soft keys at the bottom of the Trait Templates screen—**Add** (F1), **Edit** (F2), **Delete** (F3), **Copy** (F4), **Close** (F5)—to manage traits. Each option is described below.



Figure 5-10: Soft keys on the Trait Templates screen

- **Add (F1) or Edit (F2).** Adding or editing a template lets you group a set of traits together for easy data collection.

To add a template, press **Add** (F1). To edit or view an existing template, highlight the trait and press **Edit** (F2). These soft keys prompt the Add/Edit Trait Templates screen (Fig. 5-11).

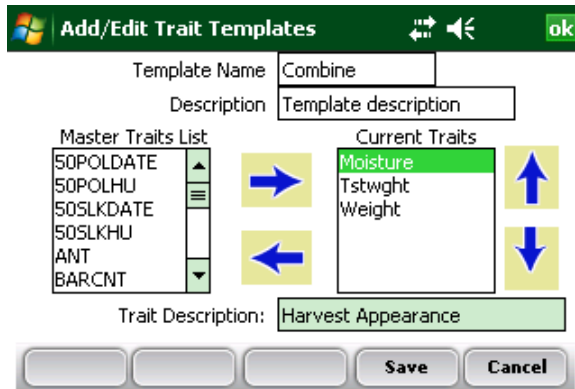


Figure 5-11: Add/Edit Trait Templates screen

Tips for naming templates

When you select **Add** (F1), you are given an option to create a template name. Consider these tips when you create a template name:

- Choose a template name that represents groups of traits to be collected at one time
- Choose a name that makes it easy to remember the trait type
- Trait template names can be up to 20 characters long
- **Trait template names cannot use symbols such as /, \, :, *, ?, “, <, >, or |**

- **Delete (F3).** Use this soft key to delete any highlighted templates.
- **Copy (F4).** Automatically creates a copy of the highlighted template and opens the Add/Edit Trait Templates screen (Fig. 5-11).
- **Close (F5).** Closes the window and returns you to the Setup screen.

Selecting traits for a template

The Add/Edit Trait Templates screen (Fig. 5-11) displays a template's name, description, the description of a selected trait, the list of traits in the Master Traits List, and any current traits. Use this screen to add, remove, or change the order of traits in a template. Each task is described below.

Add a trait

To add specific traits to a trait template, follow these steps.

1. In the Add/Edit Trait Templates screen, highlight a trait in the Master Traits List box.
2. Move the selected trait to the Current Traits list by tapping the right arrow or pressing the Right arrow key on the keyboard, as shown in Figure 5-12.

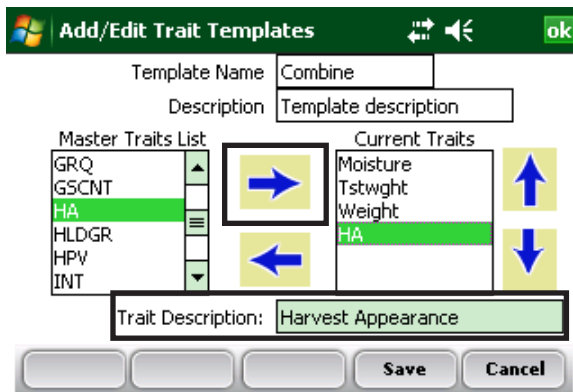


Figure 5-12: Adding a trait to the Current Traits list

Note: For easy trait identification, the description of a trait appears in the trait description window when a trait is highlighted in the Master Traits List subwindow.

3. When you are finished, press **Save** (F4). The Trait Templates screen reappears (Fig. 5-13). Make sure the list of traits is correct.

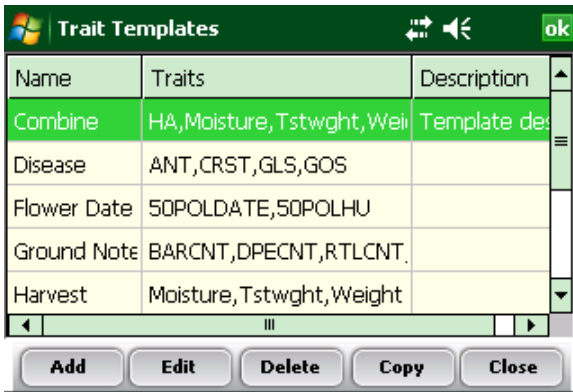


Figure 5-13: Trait Templates screen showing the modified Combine trait

Remove a trait

Highlight a trait in the Current Traits box on the right and press or select the left arrow, as shown in Fig. 5-14. Press **Save** (F4).

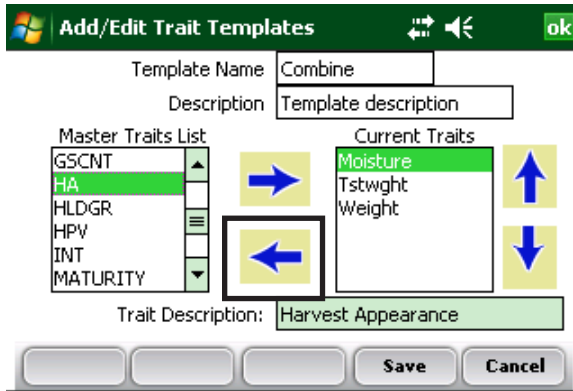


Figure 5-14: Removing a trait

Change the order of traits

You can change the order of traits by highlighting them and selecting the up or down arrow located on the right side of the template window, as shown in Fig. 5-15.

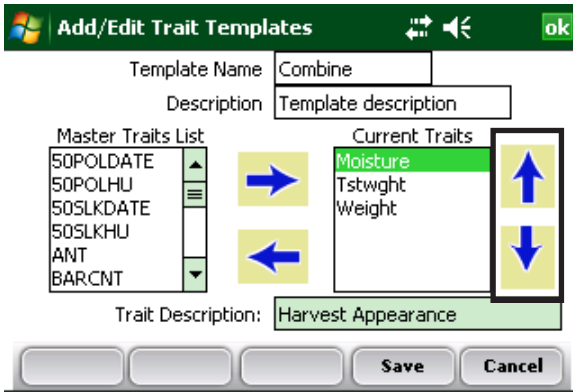


Figure 5-15: Changing the order of traits

Changing the order of the traits changes the order in which the traits will appear in Collect. The traits will appear in alphabetical order on the Trait Templates screen.

When you have finished arranging your traits, press **Save** (F4).



CHAPTER 6

CREATING A FIELD MAP

Creating a range/row map

Creating a standard plot ID map

View existing maps

Creating a Field Map

FRS is designed to help you organize your collected data using field maps. Instead of creating individual files for each field, FRS stores all field map information in a database. In addition, FRS stores data collected with each field map in the same database. This means that all trait data collected throughout the year is associated with each individual field map.

To manage field maps, press **Maps** (F2) on the main FRS screen. The Field Maps list screen appears (Figure 6-1). From this screen, you can add, edit, delete, or view maps using the soft keys on the bottom of the screen.

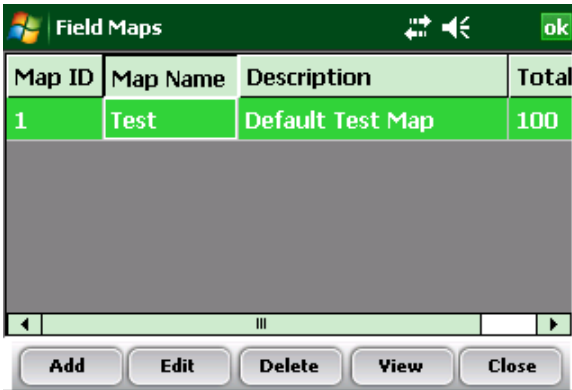


Figure 6-1: Field Maps list screen

Specifically, you can create or edit range/row field maps or standard plot ID maps. (For a description of each map, see the sections in this chapter called *Creating a Range/Row Map* or *Creating a Standard Plot ID Map*.) By pressing the soft key **Add** (F1) you can also choose to copy an existing field map.

Creating a range/row map

In a range/row field map, **Range** indicates the first horizontal group of plots and **Row** indicates a vertical group of plots.

Row or plot

4,1	4,2	4,3	4,4	4,5	
3,1	3,2	3,3	3,4	3,5	
2,1	2,2	2,3	2,4	2,5	
1,1	1,2	1,3	1,4	1,5	

Range

Figure 6-2: Range/Row Field Map

To create a range/row map, follow these steps:

1. Press **Add** (F1) on the Field Maps list screen (Figure 6-1).

- The Field Map Definition Type screen appears (Figure 6-3). Choose **Range/Row Map** from the first drop-down box, as shown here and select **Create** (F4).

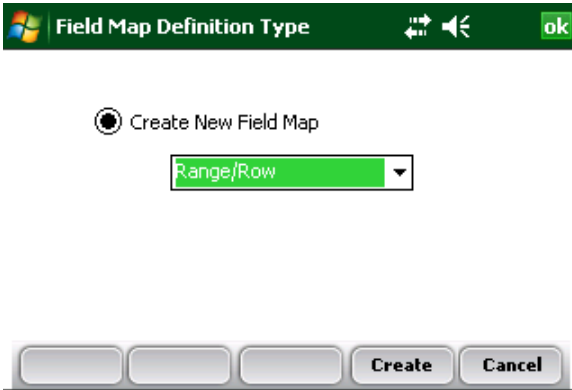


Figure 6-3: Field Map Definition Type screen

- The Add/Edit Field Map screen appears for a range/row field map (Fig. 6-4). Fill out the text fields, described below and select **Create** (F4).

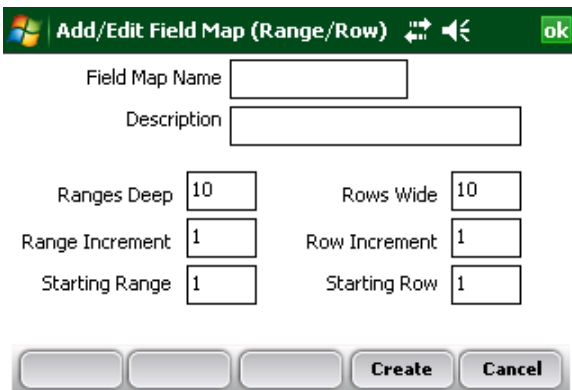


Figure 6-4: Add/Edit Field Map (Range/Row)

- **Field Map Name.** Map names help coordinate map location and other information about a field. Map names can be up to 20 alphanumeric characters. **Map names cannot contain the symbols / \ : * ? “ < > | .**
- **Description.** Enter a description for the field map. Map descriptions can be up to 50 characters long.
- **Ranges Deep.** The number of ranges deep corresponds to the number of ranges within a given field. Range numbering begins with the bottom left corner of a field and proceeds upward. In the example below, the field map is four ranges deep.

```

4,1  4,2  4,3  4,4  4,5
3,1  3,2  3,3  3,4  3,5
2,1  2,2  2,3  2,4  2,5
1,1  1,2  1,3  1,4  1,5

```

Figure 6-5: Map with depth of four ranges

- **Rows Wide.** The number of rows wide corresponds to the number of plot columns within a field. Row numbering begins with the bottom or lower left corner of a field. The range/row field map shown in Figure 6-6 is five rows or plots wide.

```

4,1  4,2  4,3  4,4  4,5
3,1  3,2  3,3  3,4  3,5
2,1  2,2  2,3  2,4  2,5
1,1  1,2  1,3  1,4  1,5

```

Figure 6-6: Centerville map with width of five rows/plots

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- **Range Increment.** In a typical range/row field, the range increment is one.
- **Row Increment.** Denotes the number of rows within a plot. The number is usually one. However, you can denote the actual number of rows within a plot by inserting the appropriate increment. For example, if you have two rows within a plot and you want to distinguish the first row in each plot, set this increment to two. Rows are then numbered 1, 3, 5, 7, 9 . . .
- **Starting Range.** Denotes the beginning range number you plan to use to collect data. This number is set to one by default but is not limited to any number. It typically begins in the bottom left hand corner of the field. Figure 6-7 shows a typical map with a starting range of one.
- **Starting Row.** Indicates the beginning row number you plan to use to collect data. This number is set to one by default but is not limited to any number. It typically begins in the bottom left hand corner of the field. Figure 6-8 shows a map with a starting row of one.

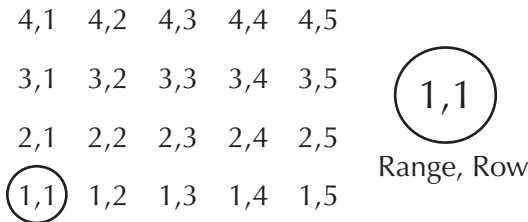


Figure 6-7: Example of a map with a starting range of one and starting row of one

Creating a standard plot ID map

Standard Plot ID maps give a unique ID number to each individual plot. Increase the number by one to indicate another plot and increase the number by a hundred to indicate the next replication. An example of a standard plot ID map follows.

Rep						
	401	402	403	404	405	
	301	302	303	304	305	
	201	202	203	204	205	
	101	102	103	104	105	Row

Figure 6-8: Example of a standard plot ID map

To create or edit a standard plot ID map, follow these steps:

1. Choose **Add** (F1) or **Edit** (F2) from the Field Maps list screen (Fig. 6-9).

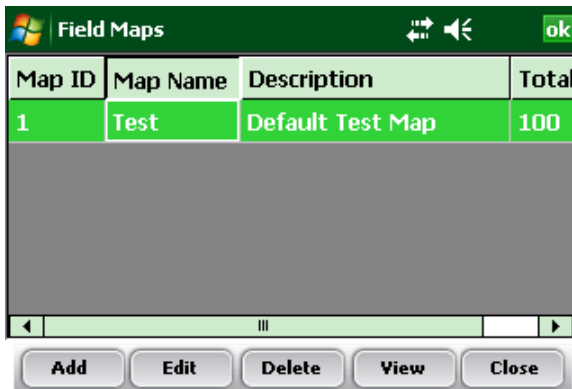


Figure 6-9: Field Maps list screen

- Pressing **Add** (F1) makes the Field Map screen appear (Fig. 6-10). **Select Standard Plot ID** from the top menu. (From this screen you can copy a map.)

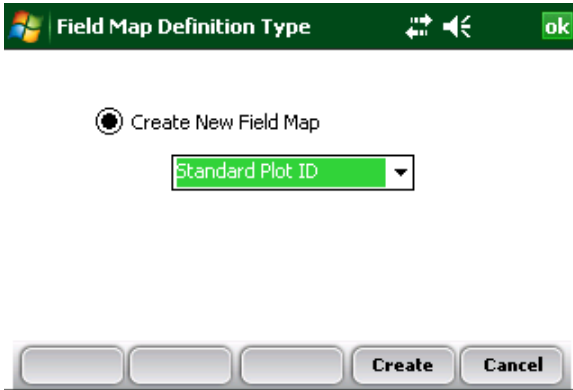


Figure 6-10: Field Map Definition Type screen

- Select **Create** (F4).
- The Add/Edit Field Map screen appears for a Standard Plot ID map. Fill in the text fields, described below. When you are finished, press **Create** (F4).

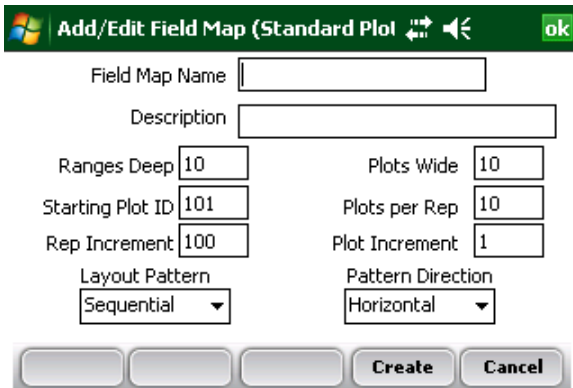


Figure 6-11: Add/Edit Field Map screen

Elements of the Standard Plot ID Add/Edit Field Map screen

- **Field Map Name/Description.** Create a map name and description for easy identification. Map names can be up to 20 characters; map descriptions can be up to 50 characters. **Map names may not contain the symbols / \ : * ? " < > |.**
- **Plots Wide.** The number of plots wide corresponds to the number of plots within a field. Numbering of fields begins with the bottom or lower left corner of a field and proceeds to the right. The following standard plot ID map is 5 plots wide.

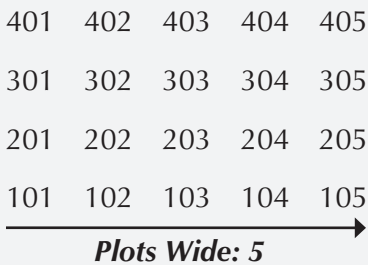


Figure 6-12: Example of a standard plot ID map

- **Ranges Deep.** The number of ranges deep corresponds to the number of ranges within a given field. Range numbering begins with the bottom left corner of a field and proceeds upward. In the example below, the standard plot ID map is 4 ranges deep.

401	402	403	404	405	
301	302	303	304	305	
201	202	203	204	205	Ranges Deep: 4
101	102	103	104	105	

Figure 6-13: Example of a standard plot ID map

- **Plots per Rep.** A replication (rep) is typically the first range across the field. The number of Plots per Rep is usually set to equal the number of Plots Wide.

In some cases a rep may extend beyond the first range and into the second range. If a field is 5 plots wide but the Plots per Rep is 10, both range 1 and 2 would include the first rep, as shown in the example here.

210	209	208	207	206	Plots Wide: 5
					Plots per Rep: 10
201	202	203	204	205	Ranges Deep: 4
110	109	108	107	106	
					One rep
101	102	103	104	105	

Figure 6-14: Standard plot ID map showing one rep

- **Starting Plot ID.** Starting plot ID corresponds to the starting number used for the bottom left plot. Examples are 101, 1001, 10001.
- **Plot Increment.** The plot increment refers to the least significant numbers in the Starting Plot ID number. If

a plot increment is 1, the plots would increment as follows: 101, 102, 103 . . .

- **Rep Increment.** Rep Increment refers to the increment used for each range or rep. The left most numbers in the Starting Plot ID number. For example, if a rep increment is 100, the plots from rep to rep would go 101, 201, 301 . . .
- **Layout pattern.** The layout pattern refers to the sequence of plot increments. Options include Sequential (Fig. 6-15) or Serpentine (Fig. 6-16).

401 402 403 404 405
 301 302 303 304 305
 201 202 203 204 205
 101 102 103 104 105

Figure 6-15: Sequential layout pattern

405 404 403 402 401
 301 302 303 304 305
 205 204 203 202 201
 101 102 103 104 105

Figure 6-16: Serpentine layout pattern

- **Pattern Direction.** Pattern direction refers to the direction in which plot increments increase.

View existing maps

To view maps you have created, press **View** (F4) on the Field Maps main screen (Fig. 6-17). The View Plots screen (Fig. 6-18) appears. **Select Standard Plot ID** from the Display Data drop-down menu.

The screen provides a two-dimensional representation of a map so you can view previously collected data, identifiers, and dimensions of the map. It also provides a way to visually verify that a newly created field map was created correctly. The arrow keys let you move around in the map to check numbering. A zoom feature allows you to expand the number of plots on the display.

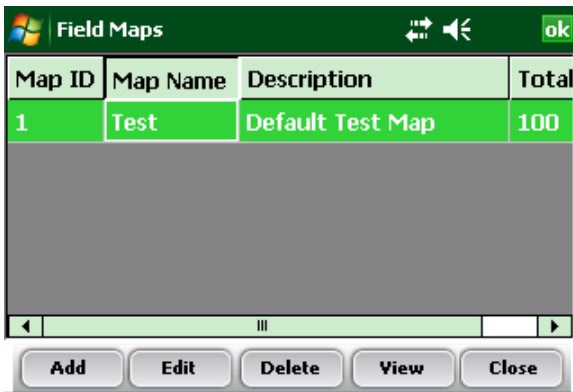


Figure 6-17: Press the View soft key to view a map

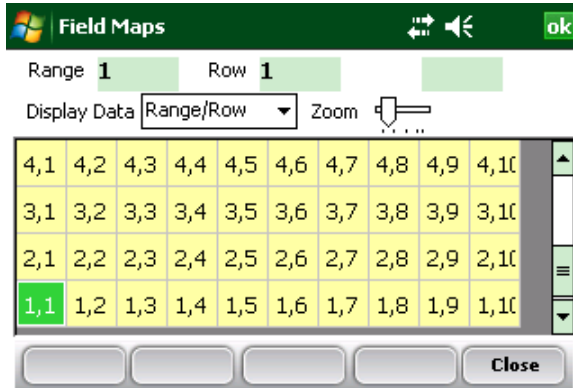


Figure 6-18: View Field Maps screen

Editing existing maps

To edit an existing map, press Edit (F2) on the Field Maps main screen (Fig. 6-17). Add/Edit Field Map screen appears (Fig 6-19).

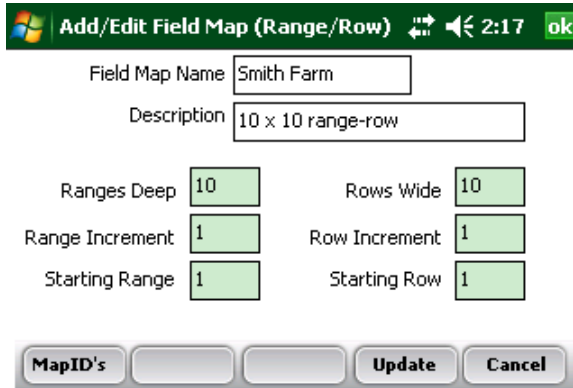


Figure 6-19: Editing field maps

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Select the changes you wish to make. When you are finished, press **Update** (F4). The map will be updated with the changes you made.

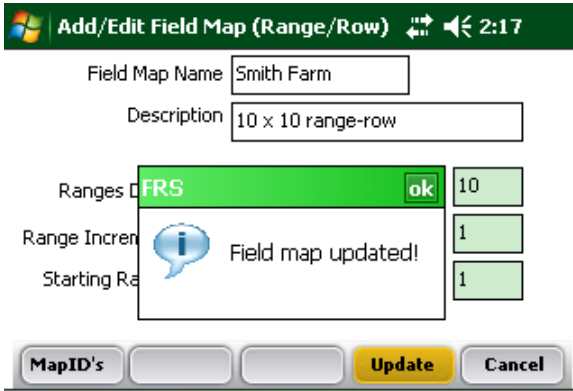


Figure 6-20: Map update complete

CHAPTER 7

IMPORTING AND EXPORTING DATA

Importing a master trait list

Elements of a master trait list file

Importing trait templates

Copying a database from one handheld to another

Exporting to a Desktop computer

Extracting collected data

Elements of the Import/Export Utility screen

Transferring data to the desktop computer

Importing and exporting data



The Import option on the Setup screen allows you to import field map information such as Range, Row, and Pedigree onto your handheld device. This option also allows you to import field map information (e.g., trait lists) created in Microsoft® Excel® or research programs like PRISM® and AGROBASE®.

The chapter is divided into two main sections:

- Importing a master trait list
- Importing trait templates

Importing of .csv maps is highly recommended to be done using Datalink for FRS. Importing of maps directly on the handheld is a very slow process. See chapter 9 on how to import maps using Datalink for FRS. If you still want to import .csv maps on the handheld, see the appendix.

This chapter also explains how to copy a database from one handheld to another. This process makes it easy to copy field maps, trait templates, or other trait information to multiple handhelds. For instructions, see the section in this chapter called *Copying a database from one handheld to another*.

Importing a Master Trait List

Importing a master trait list is similar to importing a field map. Follow these steps to import a list of traits into the FRS database.

1. Make sure your trait list is saved in a CSV file with each trait listed on a row in the following format: Trait name, trait description, trait type, trait length, default value, data source, and repetitive (see the example below). Each of these descriptors is described in the section called *Elements of a Trait List* later in this chapter.

Example of a master trait list file in CSV format and comma delimited format

A trait list created in a database program and saved as a CSV file is organized like this:

Trait name	Description	Trait type	Length	Default value	Data source	Repetitive
MST	Moisture of Grain at Harvest	Number	3	1		no
PHT	Plant height	Rating	3	1		no
EHT	Ear height	Rating	3	1		no
HA	Harvest appearance	Rating	1	1		no

Note: Do not include a header row in your trait list. (The header row above is for illustration only.) Also, some trait lists do not include information in the Default value, Data source, or Repetitive columns. In this example, no data source is entered.

This is how the same trait list appears as a comma delimited file:

MST,Moisture of Grain at Harvest,Number,3,1,,no

PHT,Plant Height,rating,3,1,,no

EHT,Ear Height,rating,3,1,,no

HA,Harvest Appearance,rating,1,1,,no

2. Using ActiveSync® or Windows Mobile Device Center®, copy the file into the Import folder on the handheld. To do this, open the handheld window on your PC. Double click on **My Windows Mobile-Based Device > C_Drive > FRS > Import**. You can now move the files you need into this folder on your handheld.

Path: C_drive\FRS\Import.

3. In the Import/Export Utility main screen, choose **Master Trait List** from the File Type drop-down menu (Fig. 7-9). (For details about the screen, see the section in this chapter called **Elements of the Import/Export Utility main screen**.)
4. Press **Browse** to choose the file you want to import. Once you have selected the file you want, tap **OK** to return to the Import/Export Utility main screen.
5. Press **Next** (F4).

Important: When you import a trait list into the FRS database, all existing traits in the Master Trait list located on the handheld are deleted. Data already collected on the handheld is not lost or changed.

6. A warning screen appears. Press **Import** (F4).
7. Once the file has been imported, tap **OK** to return to the main Import/Export Utility screen.

Note: If you receive a message saying the file cannot be imported, open the original CSV file in a word processing program. Check to make sure each trait has seven commas, as in the following example:

Example: MST, Moisture,Number,3,1,,,

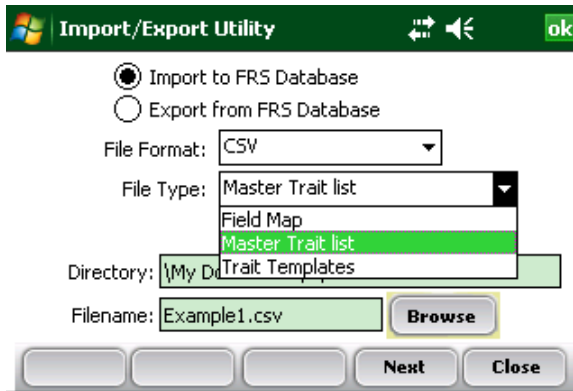


Figure 7-1: Choose Master Trait List for File Type

Elements of a master trait list file

Trait Name

The trait name can be up to 20 characters and can be a combination of letters, numbers, or symbols.

Trait Description

The trait description helps identify the trait list.

Trait Types

Choose one of the following types of data:

- Rating. A rating is a number or integer without a decimal place.
- Number. A number is a number or integer with a decimal place.
- Text. A text type trait is reserved for any alpha-numeric combinations.
- Date. A date trait is used for entering in the current data based on the handheld computers date. This trait type is especially helpful when entering flowering dates.

Trait Length

The trait length represents the maximum number of characters you will enter for each trait. For example, if most traits are between 1 and 9, enter a length of 1. If traits are between 1 and 100, enter 3. If you entered Number for the trait type, do not count the decimal as one of the trait characters.

Note: Setting a data length eliminates the need to press the enter key when you are entering data. As soon as the maximum length is entered, the software automatically moves to the next trait field.

Default Value (optional)

Use the default value column for the most common rating value. For example, if you are using ratings from one to nine and one is the most common value, list one for the default value in the trait list.

During data collection, you can press the enter key on your keyboard to automatically enter the default value for that trait. If you left the default value blank in the trait list, pressing Enter while taking notes leaves the trait empty or blank and moves you to the next trait.

If no default value is used, leave the space blank in your trait list.

Data Source (optional)

The data source can be left blank. FRS will automatically recognize the data source as **Keyboard**.

Repetitive

By checking the **Repetitive** box, you can take notes on this same trait, using the same map, at different times and dates. FRS will automatically start a new data column with the new date and time

Importing a trait template

Unlike field maps and traits lists, trait templates must be created in FRS. You can copy trait templates created in FRS from one handheld device to another. To do this, follow these steps:

1. Export the template to your desktop computer. (See Chapter 9 for export instructions.)
2. In the Import/Export Utility main screen, choose **Trait Templates** from the File Type drop-down menu.

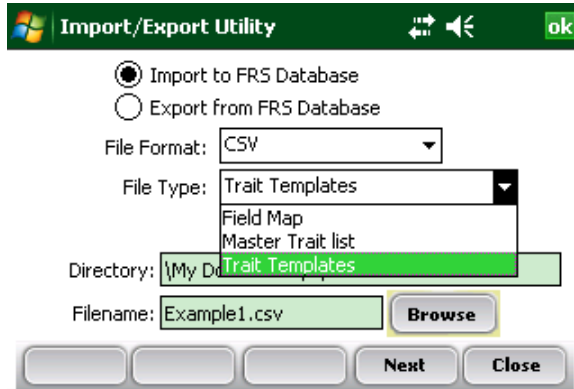


Figure 7-2: Select templates to import

3. Press **Browse** to choose the file you want to import.
4. Once you have selected the file you want, press **OK** to return to the Import/Export Utility main screen.
5. Press **Next** (F4), then **Import** (F4).
6. When you see a message saying the template is imported, press **OK** to return to the main Import/Export Utility screen.

Copying a database from one handheld to another

The best way to copy FRS databases between handheld devices is to use Datalink for FRS, which is described in Chapter 9. Datalink is much faster, but if you prefer to use the manual method, the steps below explain this process:

1. To prepare the receiving handheld for a new database, first delete the database folder on the receiving handheld.

Allegro CX path: C_Drive\FRS\Database.

Windows Mobile path: My Device\Program Files\FRS\Database

WARNING: Deleting the database on the handheld permanently erases all existing field maps and data collection information.

2. Create an ActiveSync® or Windows Mobile Device Center® connection between the source handheld and your desktop computer.
3. On the source handheld, copy the Database folder to the desktop computer.
4. Copy the Database folder on the desktop computer to the Database folder on your receiving handheld device.

Exporting to a Desktop computer

Exporting a field map, trait list, or trait template from the handheld to a desktop computer takes two main steps:

- Extracting the collected data from the FRS database to the Export folder on the handheld
- Transferring the map from the Export folder to the desktop computer

Each step is described below.

Extracting collected data

The first step in exporting is to extract collected data from the FRS database to the Export folder on the handheld. To extract data, follow these steps:

1. Press **Setup** (F3) on the main FRS screen to enter the Setup screen.
2. Choose **Database Tools > Export CSV data** from the Setup menu. The Import/Export Utility screen appears, as shown in Figure 7-3.

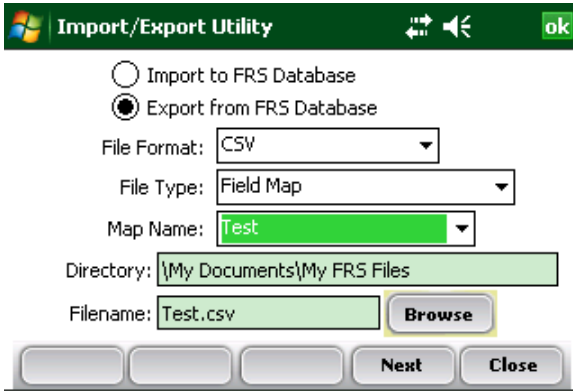


Figure 7-3: Import/Export Utility main screen

3. Select **Export from FRS Database**.
4. Fill in the information on the Import/Export Utility screen. For more information about the elements on the screen, see the section, **Elements of the Import/Export Utility screen** on page 60. To find the map file you want to export, choose **Browse**.
5. Press **Next** (F4).
6. If you extracted a field map, the Export Map Data screen appears (Fig. 7-4), showing the target path where the file will be saved. Select the option to **Include previously exported data** if you plan to export all data associated with this map again at a later time. If you only want to export new data associated with the map in the future, leave the option unselected.



Figure 7-4: Export Map Data screen

7. Press **Export** (F4) to finish exporting the file.
8. A dialog box appears when the the map is exported. Press **Close** (F5) to exit the screen.
9. Repeat this process to export all field maps.
10. Close the FRS Import/Export Utility screen when you are finished.

Transferring data to the desktop computer

Once you have exported field maps, trait lists, or trait templates to the Export folder on the handheld, copy them to your desktop computer using ActiveSync® or Windows Mobile Device Center®. (See your user manual for more details.)

Chapter 8



CHAPTER 8

COLLECTING DATA

Preparing to collect data

Navigating data collection screens

Collecting data with multiple observers

Collecting data using sub-maps

Elements of the Define/Edit Sub-Map screen

Collecting Data



This chapter shows you how to collect and manage your data using a master trait list, a trait template, and a field map. Specifically, you learn how to:

- Prepare to collect data
- Navigate the data collection screens
- Add, manipulate, and delete map traits

Preparing to collect data

To collect data, you need to first specify the field map and trait template you plan to use. FRS comes with a sample map and templates; you can select from these or you can create or import your own map and template. Refer to previous chapters for instructions to create or import a field map and set up a trait template.

Whether you choose to use a preexisting, new, or imported map and template, follow these steps to begin collecting data:

1. Select a field map and trait template from the appropriate drop-down menus on the main FRS screen (Fig. 8-1).



Figure 8-1: Choose a field map and trait template

2. Press **Collect** (F1). The Spatial screen appears (Fig. 8-2).

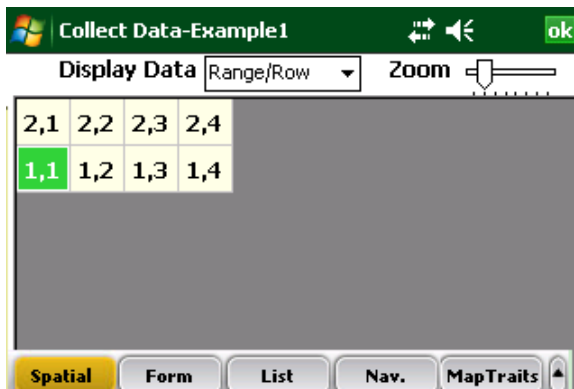


Figure 8-2: Spatial screen

3. Press one of the soft keys at the bottom of the display to view or add data. Each soft key option is described in the next section.

Navigating data collection screens

Figure 8-3 shows what the function keys do in Collect mode.

Key	Function in data collection screens	Soft key label	Key	Function in data collection screens	Soft key label
F1	Spatial view	Spatial	F4	Navigation	Nav.
F2	Form view	Form	F5	Map traits	Map Traits
F3	Spreadsheet (list) view	List	F10*	View Map Identifiers	Map IDs

Figure 8-3: Purposes of function keys in Collect mode

* To access the soft key associated with F10, press the blue key and the F10 key on your keyboard at the same time. If you prefer to press the soft key option directly, press the arrow to the right of the soft keys on the display. Another set of keys appears.

There are five main data collection screens:

- Spatial
- Navigation
- Form

- List
- Map Traits

To access screens, press the appropriate soft key at the bottom of data collection screens. Each screen is described below.

Spatial screen (F1)

Each time you enter the data collection mode, the Spatial screen appears (Fig. 8-2). The Spatial screen displays a two dimensional representation of the field map. It highlights the current plot location to help you determine the starting location for collecting data. At the top of the screen, map identifiers (e.g., range and row) indicate the location of the selected cell. (See Figure 8-2.)

The Spatial screen is helpful in other ways:

- It indicates which plots already have trait data and which ones do not
- The screen shows specific trait data for multiple plots
- Using identifiers as filters, the screen lets you select the type of data you want displayed in each cell
- You can zoom in or out to see a broader picture of the field

Elements on the Spatial screen

- **Map Identifiers.** You can select up to three identifiers at the top of the data collection screen to show your

current location within a field. If you create a field map on your handheld device, map identifiers can include Range and Row (as shown in Figure 8-2). FRS will also display Standard Plot ID (plot 101, 102, etc) after Range/Row. You can import other map identifiers on the Spatial screen (e.g., pedigree) when you import field maps.

To view additional identifiers from the imported field map, press F10 from any of the data collection screens or tap on the arrow to the right of the soft keys to access the Map ID's soft key (Fig. 8-4). The View Map Identifiers screen appears (Fig. 8-5).



Figure 8-4: Tapping on the up arrow makes the MapID's soft key appear and disappear

In the View Map Identifiers screen (Fig. 8-5), determine which identifiers you want displayed as the first, second, and third identifiers on the data collection screens. By default, the top identifier appears in the list as ID1 with the second as ID2 and the third as ID3. Move an identifier up the list by tapping the Up soft key; move the

identifier down the list by tapping the Down soft key. To save the view order or to save changes, tap **Save**.

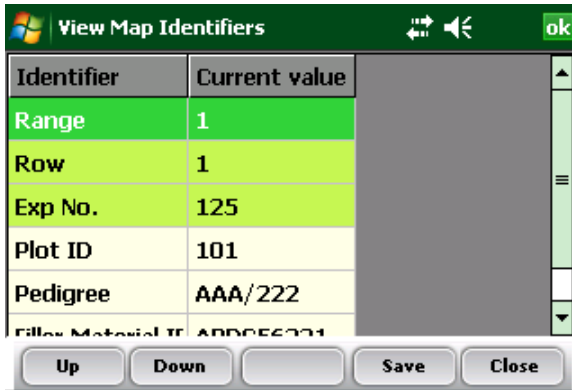


Figure 8-5: View Map Identifiers screen

On the View Map Identifiers screen (Fig. 8-5), some identifier values may be too long for the display. To see the full identifier value, highlight the map identifier and use the left or right arrow keys on the keyboard to see additional information. This feature is especially helpful when viewing identifiers with a lot of text such as pedigree.

- **Display Data.** The Display drop-down menu on the Spatial screen lets you select the type of data displayed in each plot cell. In Figure 8-6, anthracnose data are displayed.

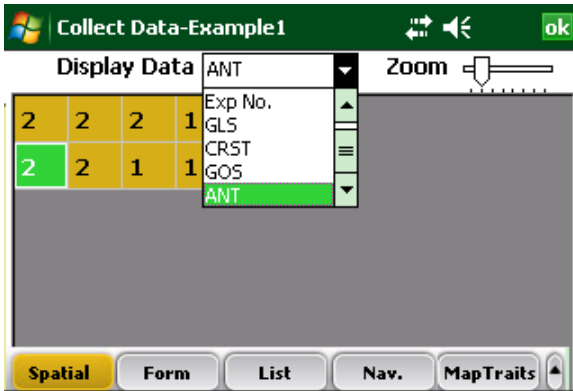


Figure 8-6: Spatial screen showing anthracnose data

- **Zoom.** A zoom feature on the Spatial screen also lets you expand plots on the display. If the zoom feature is highlighted, pressing the left or right arrow keys zooms in or out. Moving the slide bar lets you scroll to different views of the field map.

Navigation screen (F4)

Before you begin collecting data, you need to define a navigation pattern. To do so, enter the Navigation screen by pressing **Nav** (F4) on any Collect Data screen. The following navigation patterns appear as options on the Navigation screen (Fig. 8-7):

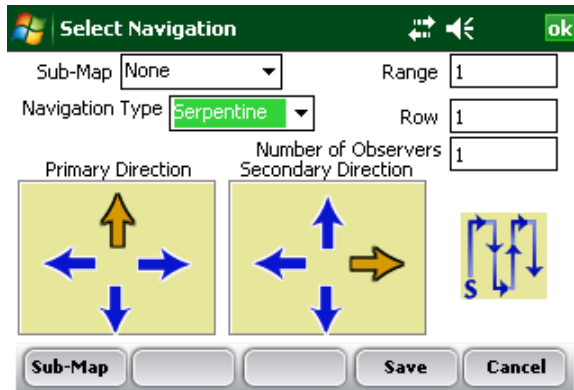


Figure 8-7: Navigation screen

- **Sub-map.** Sub-maps are navigation blocks within a field. You can select a previously saved sub-map from the Sub-Map drop-down menu at the top of the screen.
- **Navigation Type.** Select a pattern for data collection by choosing from the Navigation Type drop-down menu. Navigation patterns include Serpentine (Fig 8-8), Sequential (Fig. 8-9), Circular (Fig. 8-10) , or Random/None.

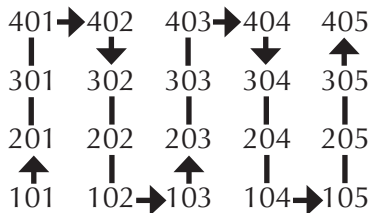


Figure 8-8: Serpentine navigation pattern

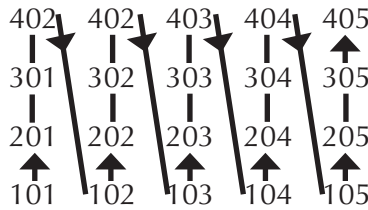


Figure 8-9: Sequential navigation pattern

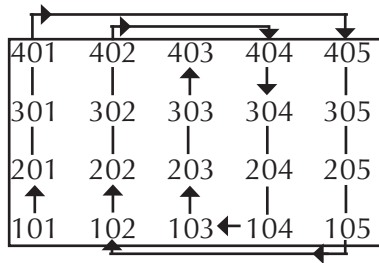


Figure 8-10: Circular navigation pattern

- **Range and Row.** Determine the starting location of the data you are collecting by entering the appropriate numbers in the Range and Row fields. These boxes also show the current location you selected on the Spatial screen.
- **Number of Observers.** Specify the number of note takers collecting data. One is the default number. For more details about using multiple observers, see the section called *Collecting data with multiple observers* in this chapter.
- **Primary Direction and Secondary Direction.** The primary direction is the first direction FRS uses to determine the order of plots to record data. The secondary direction tells FRS which direction to turn following the primary direction.

In Figures 8-8, 8-9, and 8-10, the primary direction is up. The secondary direction is right.

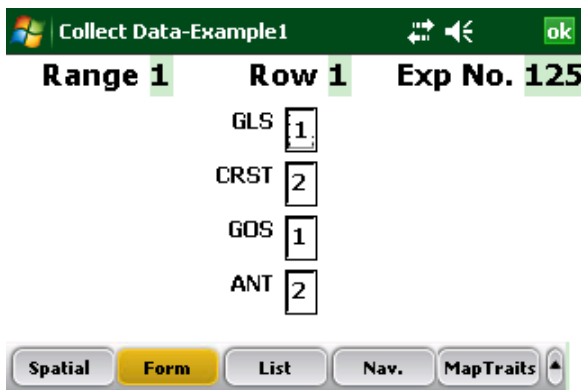
You can change the Primary and Secondary Directions (directions the software will use to navigate) by tapping on the arrows.

- **Sub-map (F1) soft key.** Tap this key to create a sub-map. See the section in this chapter called *Using sub-maps to collect data*.

Form Screen (F2)

The Form screen (Fig. 8-12) or single plot view, shows trait names and the associated data collected on an individual plot. This screen is always used during on-combine data collection.

Enter data for each trait on this screen by pressing keys or using a transcriber touchscreen. The cursor advances to the next trait when you press the enter key or when the data length is full. The left arrow takes you back one plot while the right arrow advances you to the next plot



Range 1	Row 1	Exp No. 125
GLS	1	
CRST	2	
GOS	1	
ANT	2	

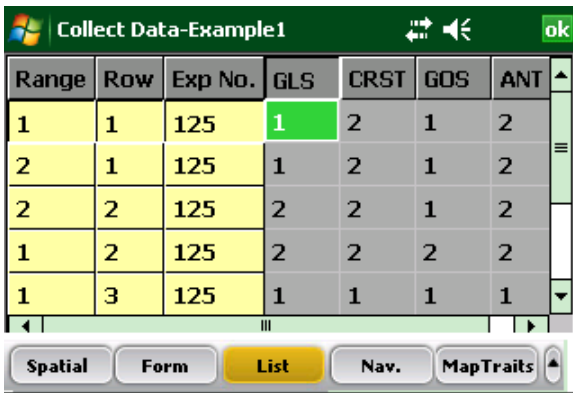
Spatial Form List Nav. MapTraits

Figure 8-11: Form Screen

Note: Each time you finish filling out all of the text fields on the Form screen, a sound signals that you have moved to a new plot. When you approach the second-to-last plot, a different sound signals that the study or map is almost finished.

List Screen (F3)

The List screen (Fig. 8-12) shows collected data in a manner similar to a spreadsheet. The sort order of the list screen is determined by the navigation pattern selected. The arrow keys allow the user to move around to different cells within the plot.



Range	Row	Exp No.	GLS	CRST	GOS	ANT
1	1	125	1	2	1	2
2	1	125	1	2	1	2
2	2	125	2	2	1	2
1	2	125	2	2	2	2
1	3	125	1	1	1	1

Figure 8-12: List screen

You can enter data into each trait in the List screen using the keyboard or a transcriber touchscreen program. The cursor advances to the next trait when the data width is full or the user presses the Enter key.

If you are collecting a date trait such as a flowering or

maturity date, press the Enter key on your handheld—it automatically enters today’s date. Pressing the up arrow advances the current date by one day. Pressing the down arrow key decrements the date.

Note: The Spatial, Form, and List screens always show the range, row, plot number, and collected data based on the highlighted plot on the current screen.

Map Traits screen (F5)

The Map Traits screen (Fig. 8-13) shows the name, length, and default value for traits you are using currently and those you have used before. You can modify traits within the active template and specify whether it is going to be collected or viewed. Changes you make in this screen are reflected in the Collect Data screens (see Fig. 8-15 and Fig. 8-16).

To access the Map Traits screen, press **Map Traits** (F5) on any of the Collect Data screens.

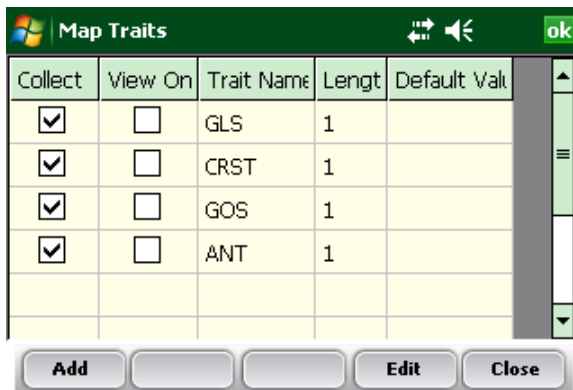


Figure 8-13: Map Traits screen

- Enable, disable, or view traits.** Selecting the *Collect* option enables you collect data for that trait; selecting *View Only* makes a previously entered trait entry visible, but it cannot be modified (see Figures 8-14 and 8-15). Leaving the Collect and View Only traits blank means the trait will not be visible or available for data entry.

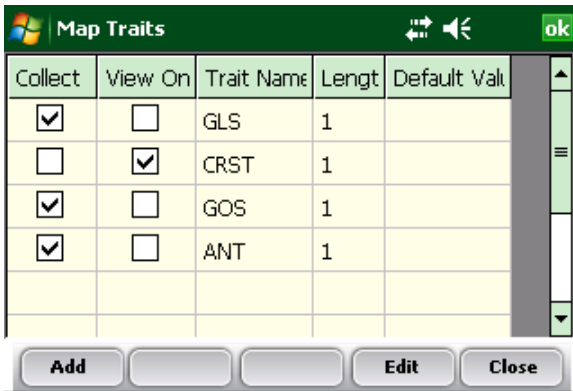


Figure 8-14: Setting CRST for viewing only

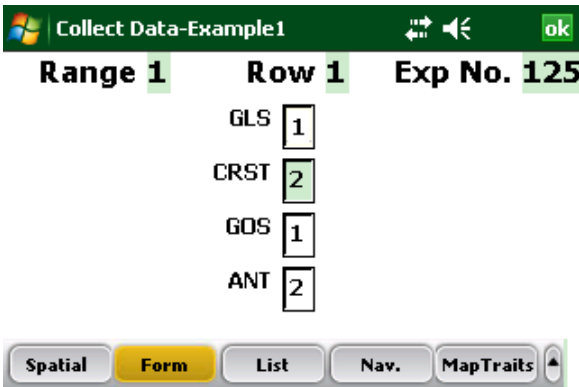
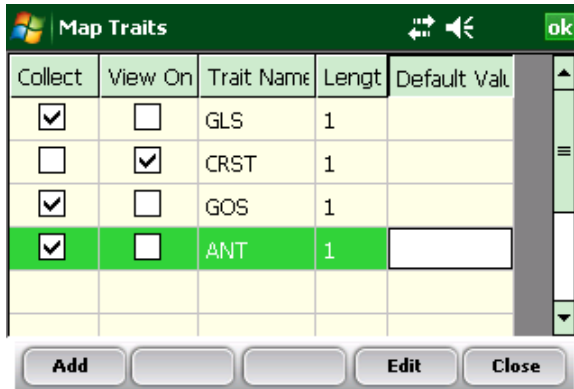


Figure 8-15: Form screen with CRST trait as view only

- **Change trait lengths and default values.** Double tap on the value you wish to change. It will highlight the entire line and place a cursor in the box tapped on. Key in the new value (see Fig. 8-16).



Collect	View On	Trait Name	Length	Default Value
<input checked="" type="checkbox"/>	<input type="checkbox"/>	GLS	1	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	CRST	1	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	GOS	1	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	ANT	1	<input type="text"/>

Figure 8-16: Editing Default Value of ANT.

- **Note:** Changing lengths or default values may change previously collected data.
- **Add, manipulate, and delete map traits.** Pressing **Add** (F1) on the Map Traits screen opens the Add Map Traits screen (Fig. 8-17), which lets you do the following:
 - Add a trait from the Master Trait list
 - Reorganize existing traits
 - Remove existing traits
 - Add and define a new map trait and add it to the map

- **Add a trait from the Master Trait List.** Follow the steps below to add a trait.
 1. From the Map Traits screen (Fig. 8-13), press **Add** (F1). The Add Map Traits screen appears.

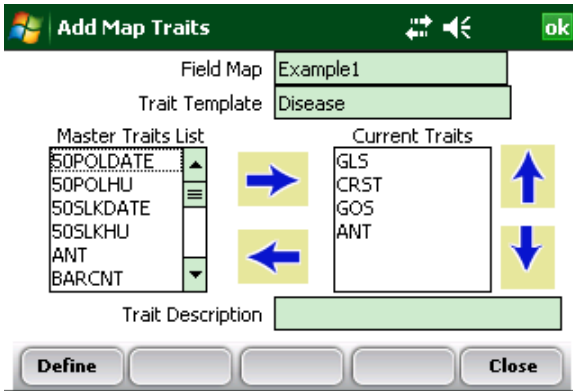


Figure 8-17: Add Map Traits screen

2. Highlight a trait in the Master Traits List sub-window on the left.
 3. Move the selected trait by tapping on the right arrow or pressing the Right arrow key on the keyboard.
- **Reorganize existing traits.** You can change the order of traits by highlighting a trait then selecting the up or down arrow located on the right side of the template window.
 - **Remove existing traits.** To remove a trait, highlight it in the Current Traits window on the Add Map Traits screen (Fig. 8-17) and tap on the left arrow.
- Note:** Only traits without data can be removed.

- **Add additional traits to a map.** To add traits, press **Add** (F1) on the Map Traits screen (Fig. 8-13). The Add Map Traits screen appears (Fig. 8-17).
- **Define a map trait.** You can further define a map trait by tapping **Define** (F1) on the Add Map Traits screen (Fig. 8-18). The Add/Edit Traits screen appears (Fig. 8-19).

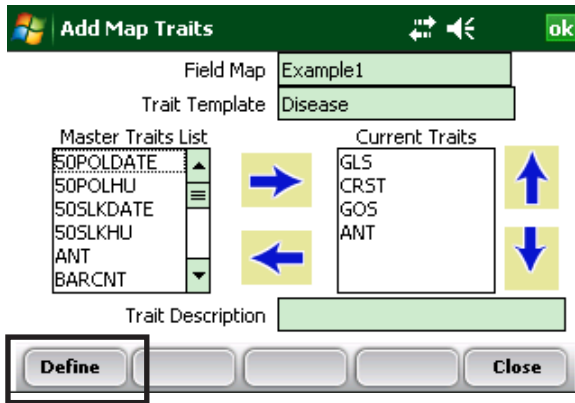


Figure 8-18: Tap Define to define a trait

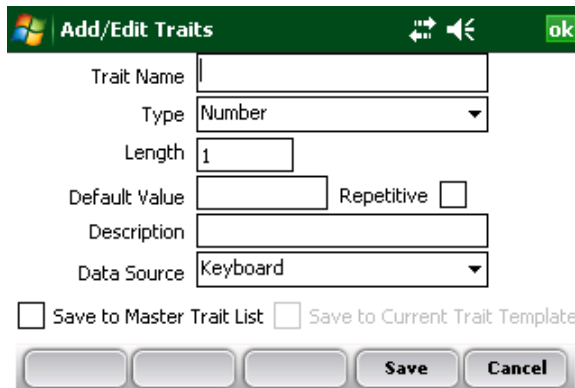


Figure 8-19: Add/Edit Traits screen

- For details about each option on the Add/Edit Traits screen, see the section called **Traits Management** in Chapter 5.
- **Note:** You are given two options at the bottom of the Add/Edit Traits screen. To add the trait to the map, fill in the needed information then select **Save to Master Trait List** or **Save to current Trait Template**.

Collecting data with multiple observers

FRS can be used to collect data with multiple observers while using a single handheld computer. This feature is often used when collecting stand counts.

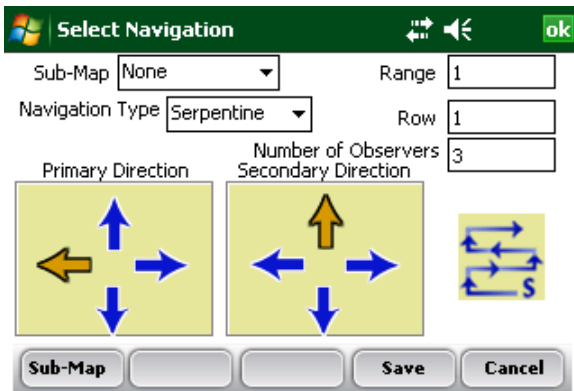


Figure 8-20: Navigation screen

Collecting data changes when you use one data collector and multiple observers. The first observer is used on one plot. Then the second observer is used on one plot and so forth until all the observers have recorded data. Then FRS moves to the next plot in sequence with the first observer to

repeat the process. In each case the lowest range or row is always collected first (see Fig. 8-21).

To collect data with multiple observers, select the **Navigation** soft key from any of the data collection screens. From the Navigation screen that appears (Fig. 8-20), select a starting range and row or verify that it matches your starting location. Select the number of observers you plan to use, the navigation pattern, and the primary and secondary directions.

Figure 8-21 depicts the process of collecting data with three observers and one data taker. The primary direction is up; the secondary direction is to the right.

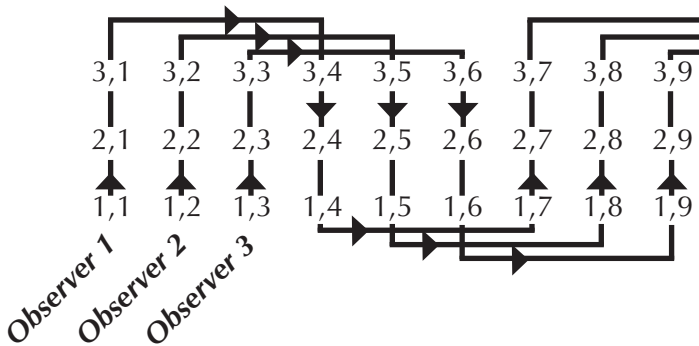


Figure 8-21: Collecting data using three observers

In Figure 8-21, the collection sequence is as follows:

1,1 1,2 1,3 2,1 2,2 2,3 3,1 3,2 3,3 3,4 3,5 3,6
 2,4 2,5 2,6 1,4 1,5 1,6 1,7 1,8 1,9 2,7 2,8 2,9
 3,7 3,8 3,9

Collecting data using sub-maps

The sub-map feature lets you block out a smaller section of a field for note taking. Access a sub-map by pressing *Sub-Map* (F1) on the Navigation screen (see Fig. 8-22).

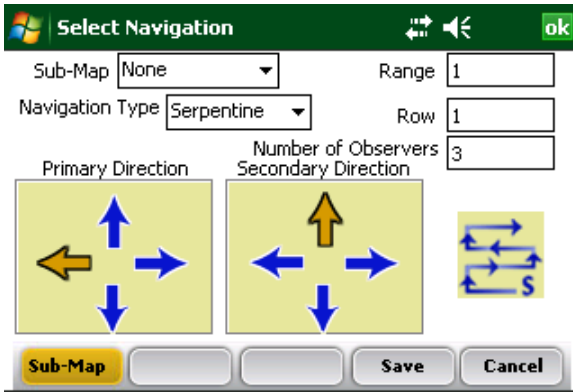


Figure 8-22: Tap on the Sub-Map soft key

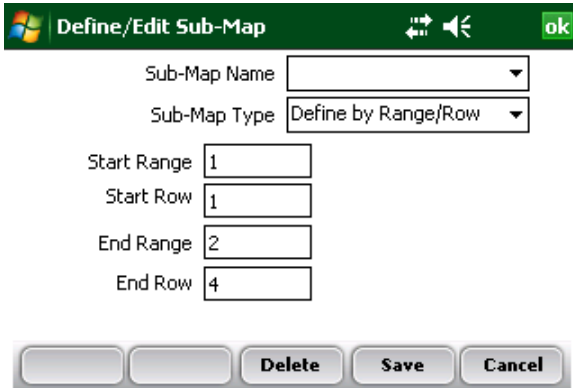


Figure 8-23: Define/Edit Sub-Map screen

Elements of the Define/Edit Sub-Map screen

Sub-map name

Name the sub-map so it can be identified later.

Sub-map type

Choose from three types:

- Define by Range/Row
- Define by Trait
- Define by Identifier

Each sub-map type is described below.

- **Define by Range/Row.** The most common sub-map type. Selecting this option brings up options specific to a range/row map. On this screen you can specify a starting range/row and ending range/row. FRS navigates within the selected range/row section.

Define/Edit Sub-Map

Sub-Map Name: 7-day watering cycle

Sub-Map Type: Define by Range/Row

Start Range: 2

Start Row: 3

End Range: 4

End Row: 5

Buttons: [Empty], Delete, Save, Cancel

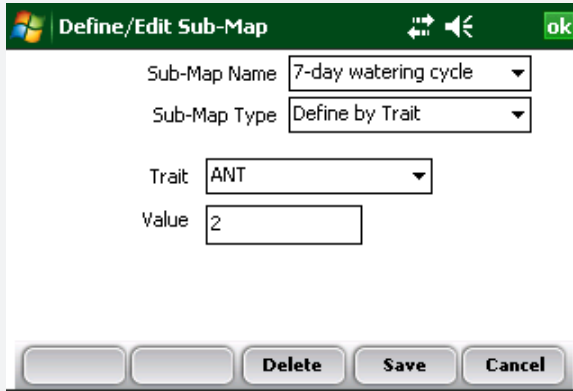
Figure 8-24: Options for defining by Range/Row

- **Start range.** This is usually the lowest range. The map in Figure 8-25 has a starting range of two.
- **Start row.** This is usually the row that starts on the left. The map in Figure 8-25 has a starting row of 3.

5,1	5,2	5,3	5,4	5,5	5,6	5,7	5,8	5,9
4,1	4,2	4,3	4,4	4,5	4,6	4,7	4,8	4,9
3,1	3,2	3,3	3,4	3,5	3,6	3,7	3,8	3,9
2,1	2,2	2,3	2,4	2,5	2,6	2,7	2,8	2,9
1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9

Figure 8-25: A sub-map defined by Range/Row

- **End range.** Usually the highest range. In the Figure 8-25, the end range is 4.
- **End row.** Usually the row farthest to the right. In Figure 8-25, the end row is 6.
- **Define by Trait.** This option allows you to select a sub-map based on a trait name and the value for that trait. The sub-map then shows all traits that match the trait name and value you entered. For example, if you are looking for a rating trait with a value of 9, select a rating trait from the Trait field and type in a value of 9 in the Value field.



Define/Edit Sub-Map

Sub-Map Name: 7-day watering cycle

Sub-Map Type: Define by Trait

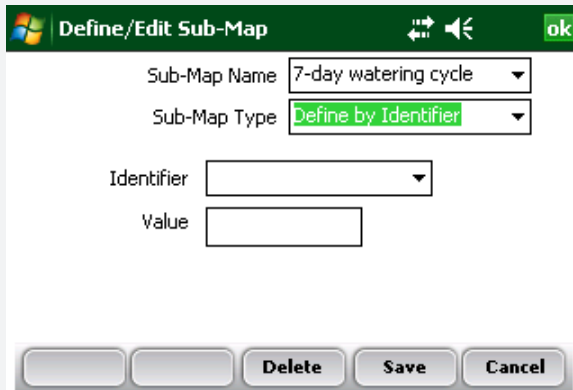
Trait: ANT

Value: 2

Buttons: Delete, Save, Cancel

Figure 8-26: Define by Trait screen options

- Define by Identifier.** This option lets you set a sub-map by a map identifier and the value of that identifier. This option is helpful when navigating to all plots with the same study or replication.



Define/Edit Sub-Map

Sub-Map Name: 7-day watering cycle

Sub-Map Type: Define by Identifier

Identifier: [Empty]

Value: [Empty]

Buttons: Delete, Save, Cancel

Figure 8-27: Define by Identifier screen options

Chapter 8

After you have filled out the Define/Edit Sub-Map screen text fields, press **Save** (F4). Choose the submap name from the Navigation screen (Fig. 8-20), and choose **Save** (F4). Press **Spatial** (F1) to return to the Spatial screen. Here you see the sub-map you created.

Note: Plots within a sub-map are a lighter shade than the surrounding plots. Plots for which data has been collected are also a different shade than those with no data.

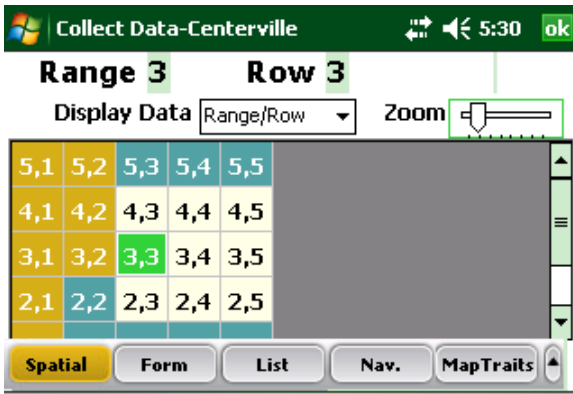


Figure 8-28: Spatial screen showing sub-map

CHAPTER 9

USING DATALINK FOR FRS

DataLink Functions

Installing DataLink

Launching DataLink

Copying the Database

Importing a File to the Database

Importing Master Trait Lists and Templates

Exporting a File from the Database

Backup and Restore Database to and from a Folder

DataLink Utilities

Save Database from PC to Handheld

Copying a database from handheld to handheld

Using DataLink for FRS

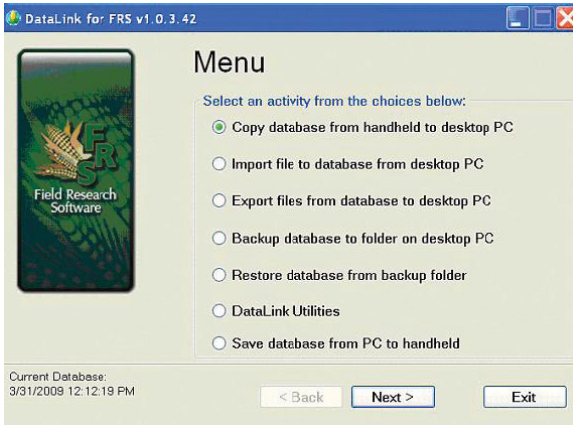


Figure 9-1: DataLink main menu

DataLink for FRS is a utility program for your PC that facilitates the management of the FRS database. The FRS database can easily become quite large and difficult to manage in a timely fashion on a handheld computer.

DataLink for FRS moves the entire database to a PC to facilitate the management of the FRS database. By using the computing power of a desktop PC, actions that might take an hour or more on a handheld computer are finished in minutes.

Cautionary Note: Because the entire database is

being copied from FRS on a hand-held computer to a PC and back to FRS, extreme care must be taken to copy the database back to the handheld computer before any other collections are made. When the database is copied from one location to another, it will overwrite the database at the destination. This can result in loss of data if due diligence is not observed.

DataLink Functions

Seven functions are available from the opening screen for *DataLink for FRS*.

The seven functions are:

- Copy database from handheld to desktop PC
- Import file to database from desktop PC
- Export files from database to desktop PC
- Backup database to folder on desktop PC
- Restore database from backup folder
- DataLink Utilities
- Save database from PC to handheld

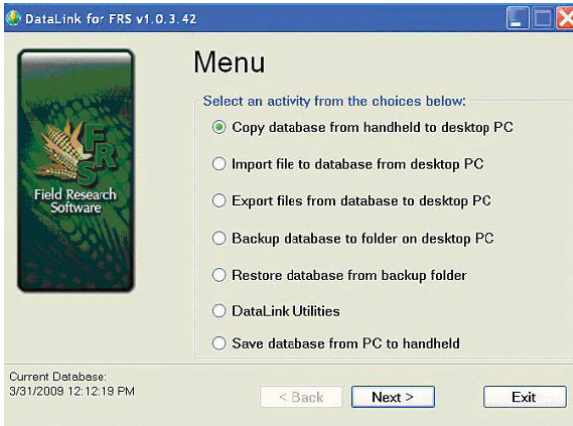


Figure 9-2: DataLink main menu

Installing DataLink

To install *DataLink for FRS* on your PC, follow these steps:

1. Go to <http://www.harvestmaster.com/HarvestMaster/support/Downloads/FRS-Suite/Datalink-for-FRS>.
2. Choose the version that matches the operating system on your PC.
3. Follow the on-line instructions to download and install the program on your PC.

Launching DataLink

DataLink will detect when a handheld device is connected via ActiveSync (XP) / Windows Mobile Device Center (Vista/7) to your PC. You can set your Allegro in the Power Dock and establish a connection either before or after launching the program.

Copying the Database

When a handheld is detected the following prompt will appear:

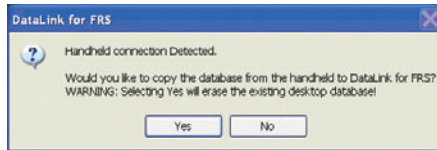


Figure 9-3: Handheld connection detected prompt

You can copy the FRS database to your PC as the software is booting or from the main menu after the software has launched

Note: FRS cannot be running when the database is copied to or from the handheld.

When the database is copied from one location to another, it will overwrite the database at the destination. This can result in loss of data if due diligence is not observed. Warnings such as the one below require you to confirm each copy request.

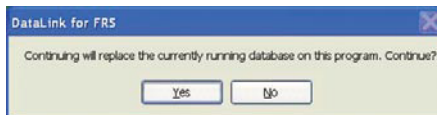


Figure 9-4: Warning screen

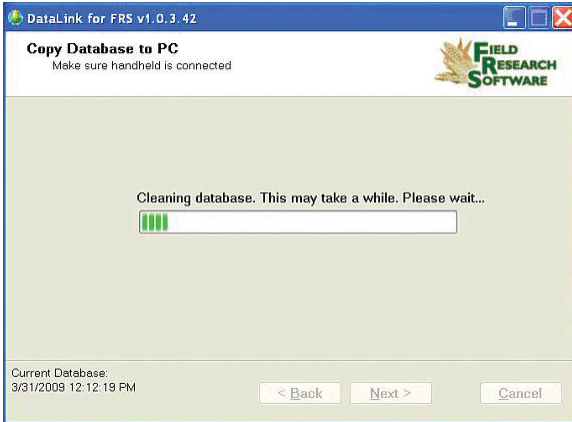


Figure 9-5: Clean Database screen

Notice that time was spent cleaning up the database. The time this requires is proportional to the size and length of time the database has been used.

Importing a File to the Database

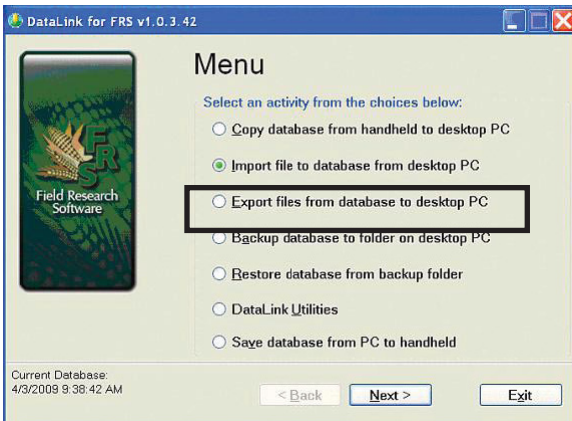


Figure 9-6: Importing file to database

Select the **Import** option and hit **Next**.

Several types of files can be imported to the database.

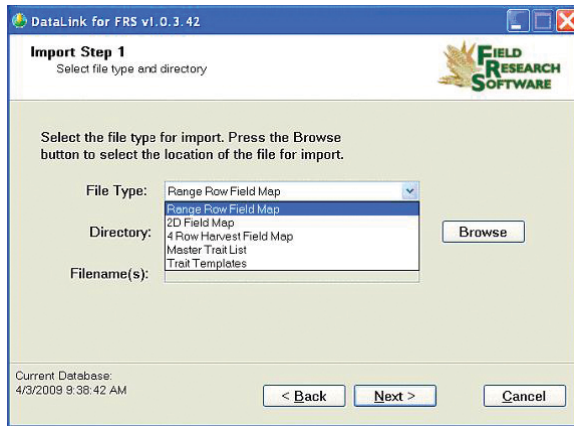


Figure 9-7: Select file type

- Range Row maps are the most common field maps in FRS.
- 2D and 4 Row maps are specialty maps for specific applications.
- The Master Trait List is a list of all traits that can be observed.
- A trait template is for organizing a smaller list of traits that are of interest for daily or seasonal observations.

These files can be created or edited on a PC and then imported to the FRS database while it is in the DataLink program on the PC.

As is common in many Windows applications, the browse feature lets you select the file to import.

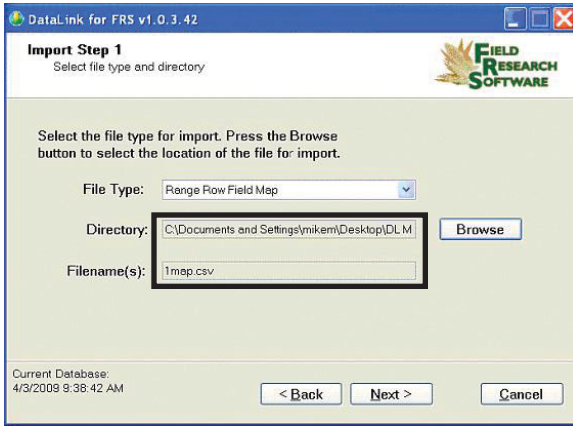


Figure 9-8: Select file

When a field map is selected, the **Next** button allows you to choose map settings. FRS organizes all maps by range row and then handles any other map identifiers simply as additional identifiers. Therefore range row must be defined as to its location in the spreadsheet that is being imported.

DataLink reads the column headings from the map to be imported, and populates them in the drop down menu. Select the appropriate column heading from the map that corresponds to the Range and Row from the choices in the drop down menu.

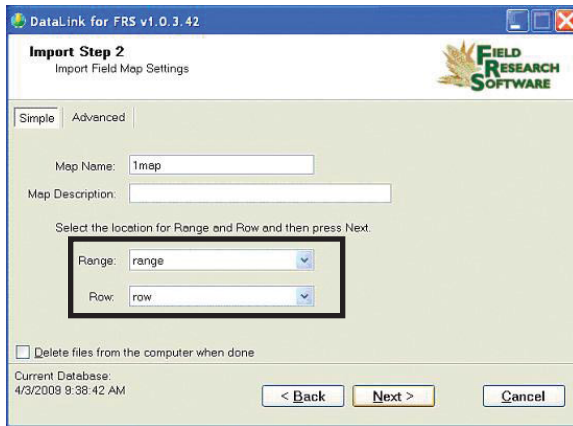


Figure 9-9: Range and Row headings

The following discussion involves specialty maps that may or may not apply to your situation. If you do not need to use 2D maps or 4 Row Harvest maps, skip this section. The 2D Map feature refers to maps that are created two dimensionally to represent the same layout as the field. ID's in 2D maps allows any plot name in any order to be used on a map. Plot names can be repeated on the same map as many times as needed. This type map must be created with a spreadsheet or text editor and saved as a tab delimited file or .txt file. Do not use any headings or spaces when creating a 2D map.

Note: Map IDs cannot contain the symbols / \ : * ? " < > | .

101	Trial	Border	102
201	202	North	South
101	102	103	104
201	202	203	204
Beans	Rice	Wheat	Corn
Sally	George	Sue	Charles

Figure 9-10: Example of 2D map layout

DataLink will assign range row to each plot and associate the plot IDs as additional plot identifiers.

The 4 Row Harvest Field Map is a unique layout where every other plot or set of two rows is border throughout the field. 4 Row Harvest Field Maps allow a map that only contains the research rows to be imported into FRS. Upon import, the border rows are created by FRS and carry the same row number as the previous research row with the addition of an "X."

Example is the first row or plot is Range 1 Row 1, then next row or plot is designated Range 1 Row 1X. This sequence is repeated throughout the field.

The field is harvested the same as any other field map with data being stored for research plots and buffer plots. Upon Export, the buffered rows are not exported, only the research rows are included in the export file.

Importing Master Trait Lists and Templates

Master trait lists and trait templates are files that can be imported. When you import either, the existing list or templates will be deleted. A warning appears so the user can confirm the action.

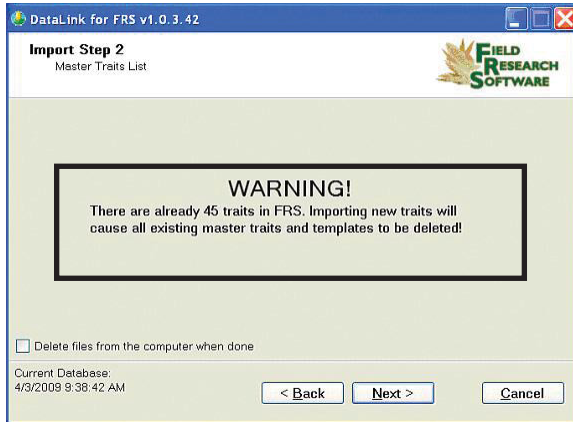


Figure 9-11: Warning on importing traits

Exporting a File from the Database

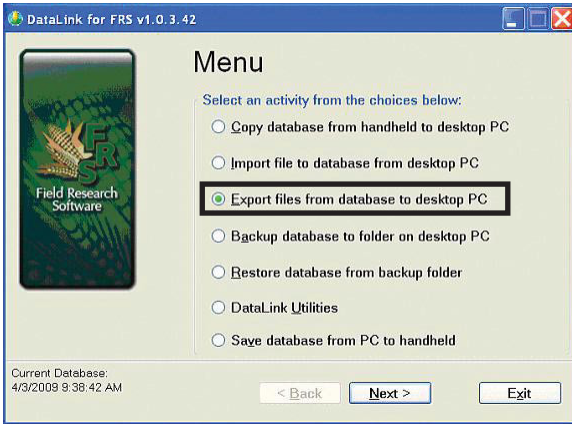


Figure 9-12: Export files from database

Select the Export option and hit Next.

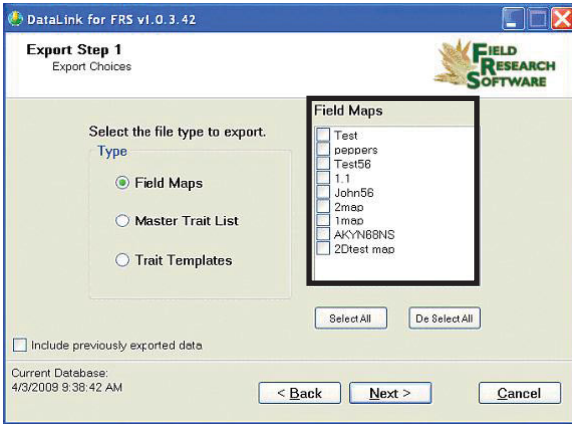


Figure 9-13: File types and files

This screen allows the selection of what file type and which files to export. The include previously exported data

checkbox allows data collected and exported in separate activities or days to all be exported together on one spreadsheet at the conclusion of a map.

For example, at the end of the season, a spreadsheet could contain several observations accomplished with different templates and traits together on one map.

Imagine that in the spring, an emergence observation could occur and the data down-loaded for safe keeping. Mid summer might be a good time to take notes on any disease evidence and that data could be downloaded. In the fall a lodging study might be appropriate and downloaded after completion. When this last data is exported, the **“Include previously exported data”** checkbox could be checked. The spreadsheet would now contain all the collected data from the season in one place.

After making the desired selection and pressing next, the choice is where to put the exported files. The browse button facilitates the choice.

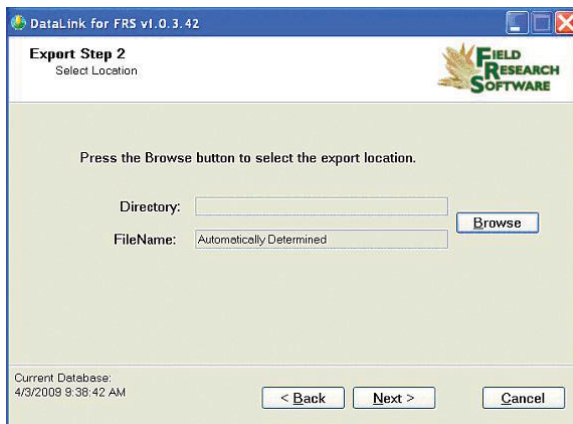


Figure 9-14: Exported file location

Step 3 allows the user to choose the map IDs and in what order, they will appear in the exported file.

Notice the checkbox near the bottom of the screen. If a map was imported as a 4 Row Harvest Field Map and buffer rows were added, checking this box will remove those added rows when the file is exported.

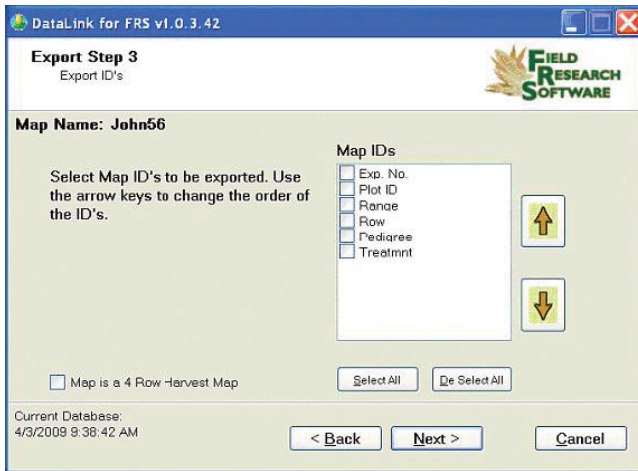


Figure 9-15: Choose which row to export

Backup and Restore Database to and from a Folder

The next feature allows the database from FRS to be relocated on the PC and stored as a backup copy. It will be stored outside of the DataLink program. The Restore feature brings the database from the storage location back into the DataLink program. This works well for “cloning” a database onto several handhelds or just archiving a database to a safe location.

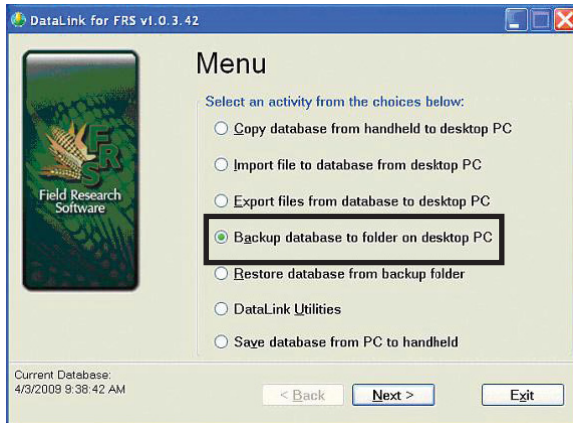


Figure 9-16: Backup database

DataLink Utilities

Select DataLink Utilities and press Next.

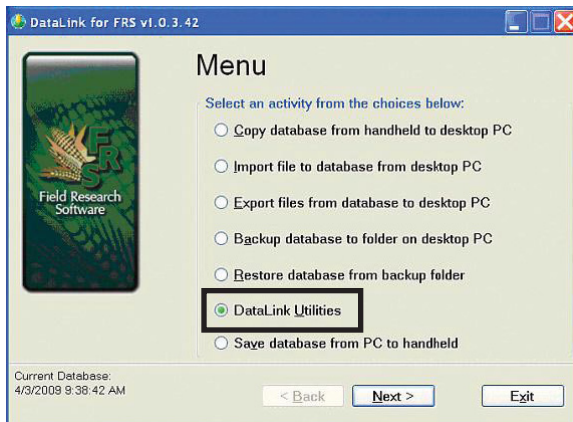


Figure 9-17: Datalink Utilities

Three utility choices are available: Delete Maps, Clean Current Database, and Copy backup log files from handheld.

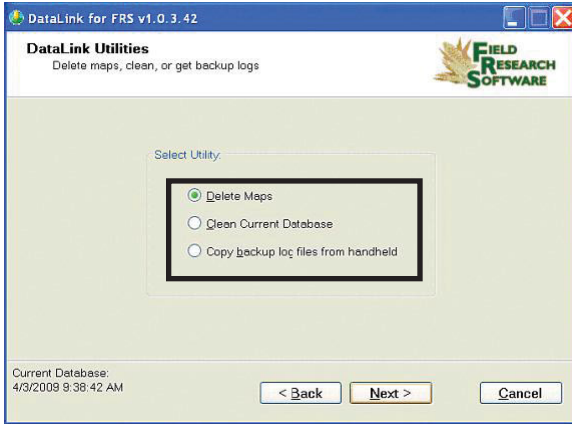


Figure 9-18: Utility choices

Delete Maps

The FRS database is a complex collection of related tables where even a simple delete command often requires considerable computing power. Being able to perform map deletions on a PC instead of on a handheld device is a substantial time saver.

Clean Current Database

Cleans all files that were previously marked for deletion. Due to the complexity of the database, delete commands made from the handheld computer are carried out by marking the file as deleted and no longer displaying it. When this utility is selected, the marked files are deleted and any associated tables are adjusted accordingly.

Copy backup log files from handheld

When data is collected in FRS it is stored in the map where the collection took place. To insure that no data is lost, a backup log is created as the data for each trait is collected. This backup log contains the time of each observation, the date and other behind the scene information. It is therefore not a concise record of only the collected data, but it is another copy of the data in case the map and its associated data are lost.

Save Database from PC to Handheld

The final menu option is to save the database back to the handheld. Select this option and choose Next.

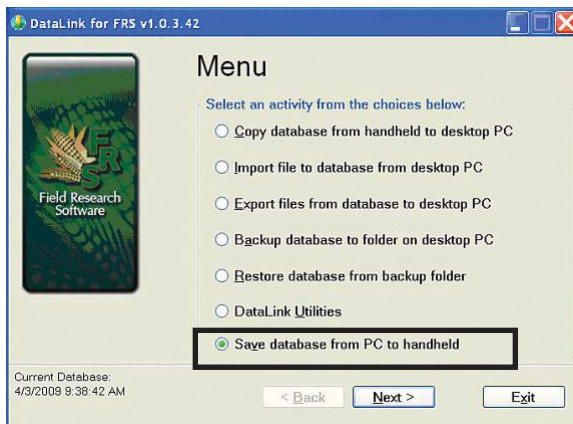


Figure 9-19: Save database

The following warning appears. Read each warning carefully and confirm that the pending action is the desired action.

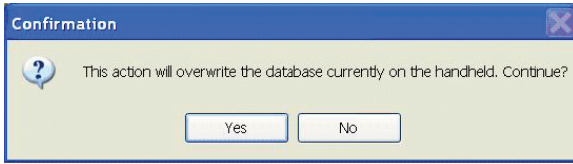


Figure 9-20: Warning

We recommend that whenever the database is copied from the handheld computer, that it should always be copied back to the handheld computer before any work is done with the handheld to avoid losing data.

By copying the cleaned database back to the handheld, the handheld will perform better because the database has been cleaned, making it smaller and more efficient.

Copying a database from handheld to handheld

1. On first handheld computer, set up the database you wish to distribute to your other handhelds, e.g., maps, traits, templates.
2. Connect handheld to computer.
3. Establish Activesync/Windows Mobile Device Center connection.
4. Run Datalink for FRS.
5. Select yes when asked if you want to copy the database from handheld to PC.

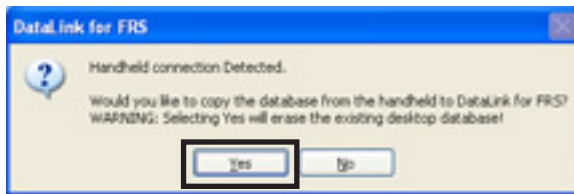


Figure 9-21: Select Yes

6. The computer will then copy the files.
7. Disconnect handheld from computer.

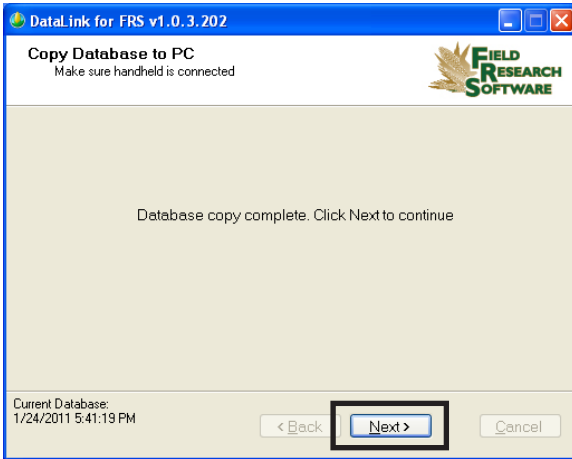


Figure 9-22: Select Next

8. Select Next.
9. Connect other handheld to computer.
10. Establish Activesync/Windows Mobile Device Center connection.
11. Run Datalink for FRS.
12. Select **NO** when asked if you want to copy the database from handheld to PC.

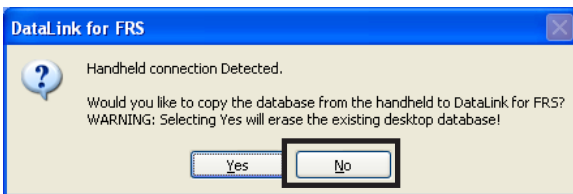


Figure 9-23: Select No

13. Select Save Database from PC to Handheld.

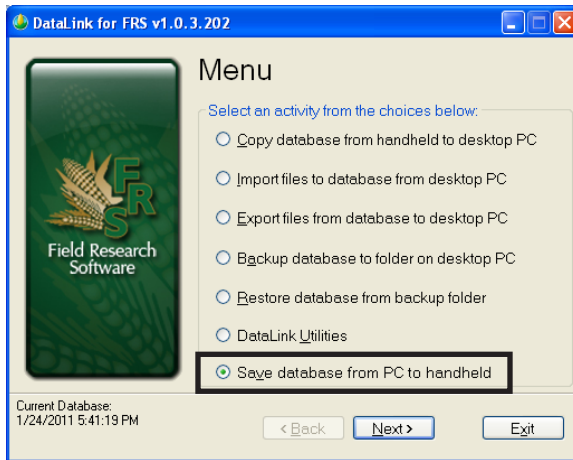


Figure 9-24: Select Save Database from PC to Handheld

14. Select **Yes** when asked if you want to continue.
15. Database will save onto handheld.
16. Disconnect handheld from PC.
17. Repeat steps 7-14 for each handheld to which you wish to copy the database.
18. When complete, exit Datalink for FRS.

APPENDIX

Importing field maps

Importing field maps

You can import field maps created in research programs to the FRS database on your handheld device. Follow the steps below to import field maps into the FRS database.

1. Make sure the field map you wish to import is saved in CSV (comma separated variable) format and that it has a header row. (See Fig. A-1). If you are using a 2D map, it must be saved as a .TXT file. Importing a 2D map must be done through Datalink for FRS.

Exp. No.	Plot ID	Range	Row	Pedigree	Filler Material ID
125	101	1	1	AAA/222	ABCD56321
125	102	1	2	AAA/222	ABCD56321
125	103	1	3	AAA/222	ABCD56321
125	104	1	4	AAA/222	ABCD56321
125	201	2	1	AAA/222	ABCD56321
125	202	2	2	AAA/222	ABCD56321
125	203	2	3	AAA/222	ABCD56321
125	204	2	4	AAA/222	ABCD56321

Figure A-1: North Forty.csv map file

FRS reads CSV files with commas between figures. Figure A-2 shows the North Forty.csv map file with commas between figures.

```
Exp. No.,Plot ID,Range,Row,Pedigee,Filler Material ID
125, 101, 1, 1, AAA/222, ABCD56321
125, 102, 1, 2, AAA/222, ABCD56321
125, 103, 1, 3, AAA/222, ABCD56321
125, 104, 1, 4, AAA/222, ABCD56321
125, 201, 2, 1, AAA/222, ABCD56321
125, 202, 2, 2, AAA/222, ABCD56321
125, 203, 2, 3, AAA/222, ABCD56321
125, 204, 2, 4, AAA/222, ABCD56321
```

Figure A-2: North Forty.csv file as it appears in a word processing program

2. Make an ActiveSync® or Windows Mobile Device Center® connection between your desktop PC and the handheld device. (If you are using an Allegro Field PC®, we recommend using a USB/Power Dock™ for the fastest connection.) For instructions on making a connection, see the user manual of your handheld.
3. FRS comes with several preexisting folders. Copy the CSV field map(s) to the Import folder on your handheld device. To do this, open the handheld window on your PC. Choose **My Windows Mobile-Based Device > C_Drive > FRS > Import**. Move the files you need into this folder. **Path:** C_Drive\FRS\Import.

Appendix

- 4. On the handheld, press **Setup** (F3) on the main FRS screen. The Setup screen appears (Fig. A-2).
- 5. Choose **Import data from CSV**, as shown in Figure A-3.

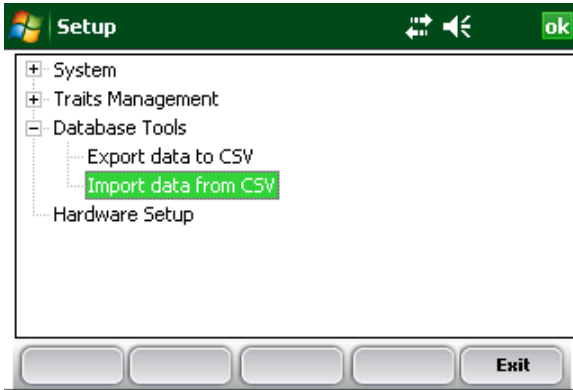


Figure A-3: Import option in the Setup screen

- 6. The main Import/Export Utility screen appears (Fig. A-4). Select **Import to FRS Database** at the top of the screen if it is not already selected.

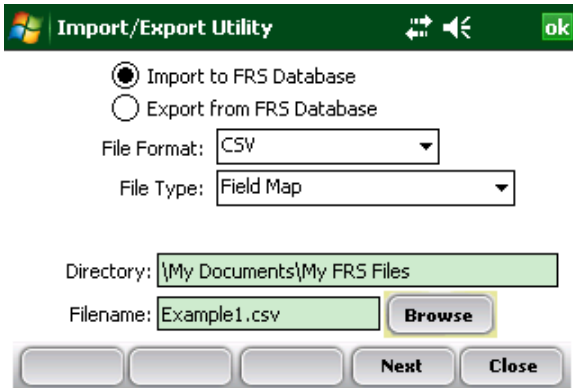


Figure A-4: Import/Export Utility main screen

Elements of the Import/Export Utility main screen

File Format. This refers to the format of the file. Currently all files are imported/exported in CSV (comma separated variable) format.

- **File Type.** The file type refers to the type of file to be imported/exported. Select *Field Map*, *Master Trait List*, or *Trait Templates*.
- **Directory.** The directory refers to the location of the field map on the handheld. The default path for an Allegro CX is: C_Drive\FRS\Export. For a mobile device, it is My Device\My Documents\My FRS Files. If no path appears in the directory, follow these steps:
 1. Tap Browse.
 2. Locate the directory folder.
 3. Select the file you want to export.
 4. Tap OK.
- **File Name.** This refers to the file to be imported/exported. The name of the file selected from the directory should appear in the window.

7. Select *Field Map* as the File Type. (See *Elements of the Import/Export Utility main screen* for more details.)
8. Press **Browse** to select the file you want. A file menu appears (Fig. A-5).

9. Tap on the file you want

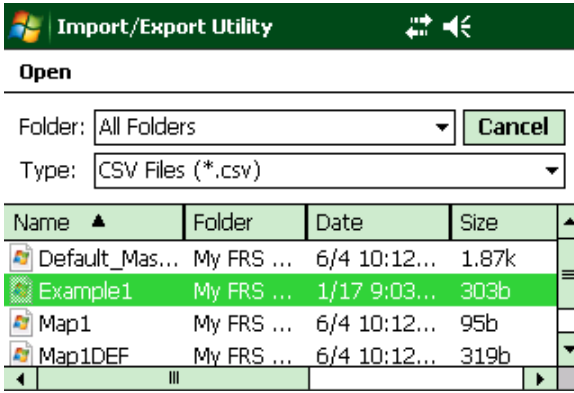


Figure A-5: Browse for a file to import

10. The Import/Export Utility screen reappears (Fig. A-6). If the file name and path are correct, press **Next** (F4).

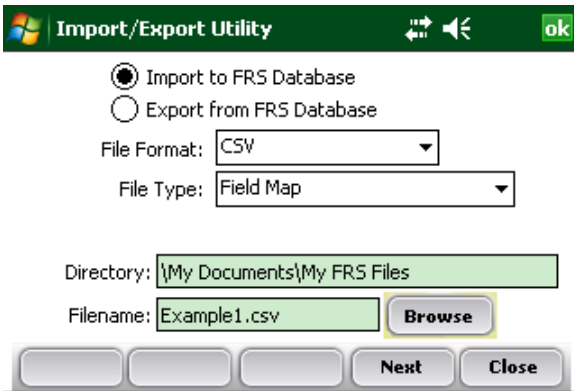


Figure A-6: Import/Export Utility main screen

11. The Import Range Row Map screen appears (Fig. A-7). Fill in the text fields on the screen. (See the section in this chapter called *Elements of the Import Range/Row Map screen*.)

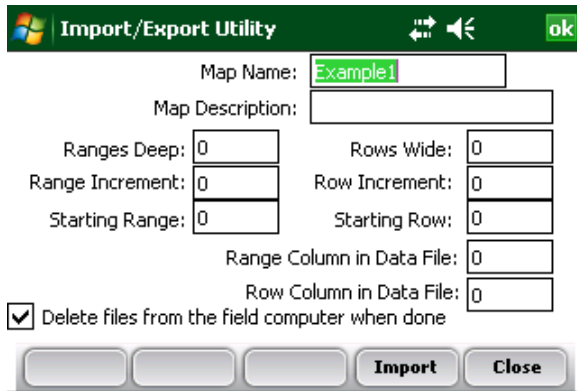


Figure A-7: Import/Export Utility screen

Elements of the Import /Export Utility screen (Fig. A-7)

- **Map Name.** A map name is used during data collection. By default, the name of the previously selected field map appears in the Map Name text field. Type in a new name to change it.
- **Map Description.** Type in a description of the imported field map to help distinguish it from others.
- **Ranges Deep.** Specify how many ranges you want in your field map.
- **Rows Wide.** Type in the number of rows or plots you want in the field map.

- **Range and Row Increments, Starting Range, and Starting Row.** The Range and Row Increments refer to the number sequence included in the field map. By default, increment values for ranges and rows—including the Starting Range and Row—are set at 1. If you prefer, you can make the Row Increment for a field map designate the actual row in each plot. In this case, the Row Increment would be 2 because there are two rows per plot. You can also change the Starting Row number.
- **Row Column and Range Column.** Range and Row information needs to be set so that the Import/Export Utility can reference which column of a map contains the range and row information. For example, in the North Forty field map shown in Figure A-8, the Range figures are located in column 3 while the Row figures are located in column 4.

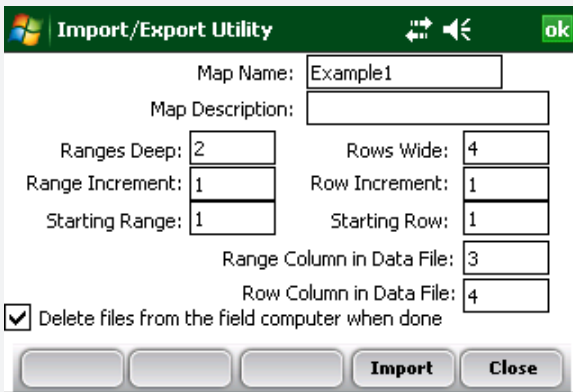


Figure A-8: Import Range/Row Map screen

- **Delete Files checkbox.** To save file space, we recommend deleting files you do not need. By default, ***Delete files from the field computer when done*** is selected so a field map is deleted from the handheld after its information is imported into the FRS database.
12. When you have finished filling out the information in the Range/Row Map window, press ***Import*** (F4).
 13. A message appears, telling you the file is imported. Press ***Close*** (F5) to close the Import window.
Note: Large field maps may take some time to import.

Appendix

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