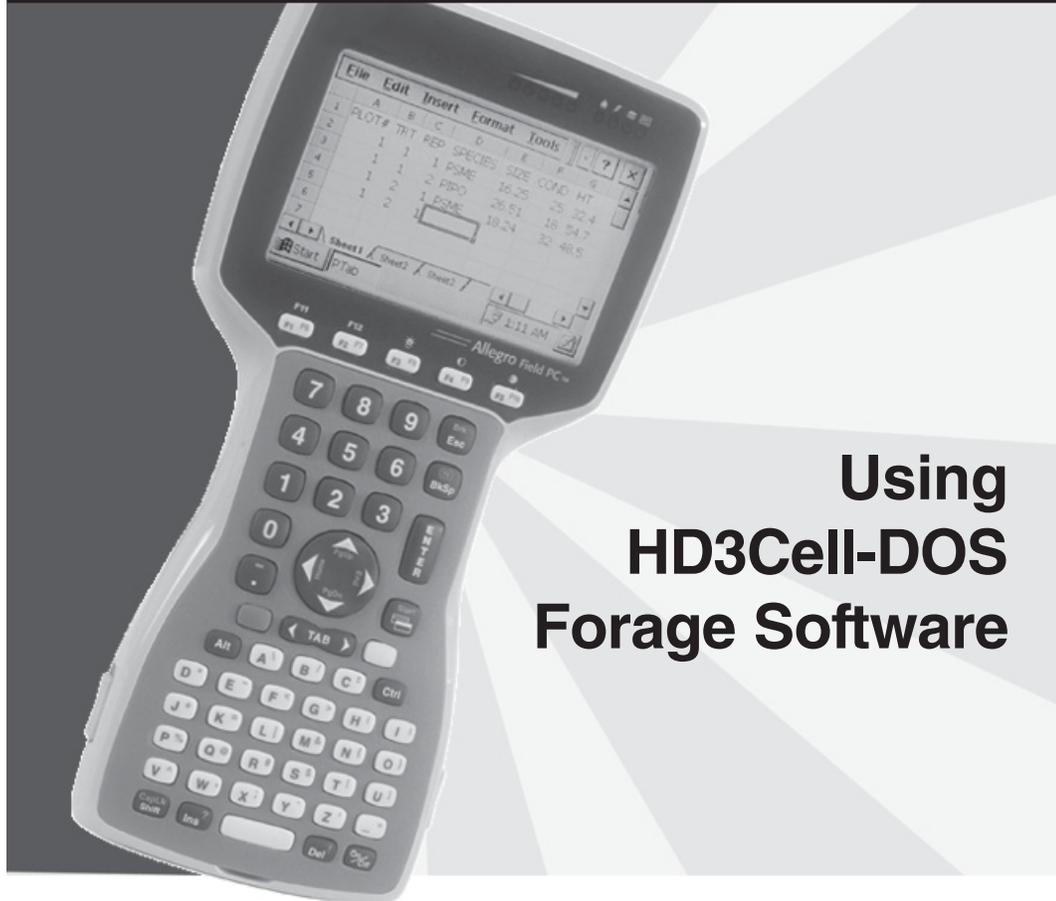# Forage Addendum

to the HDRB-DOS User's Manual

Using HD3Cell-DOS Forage Software
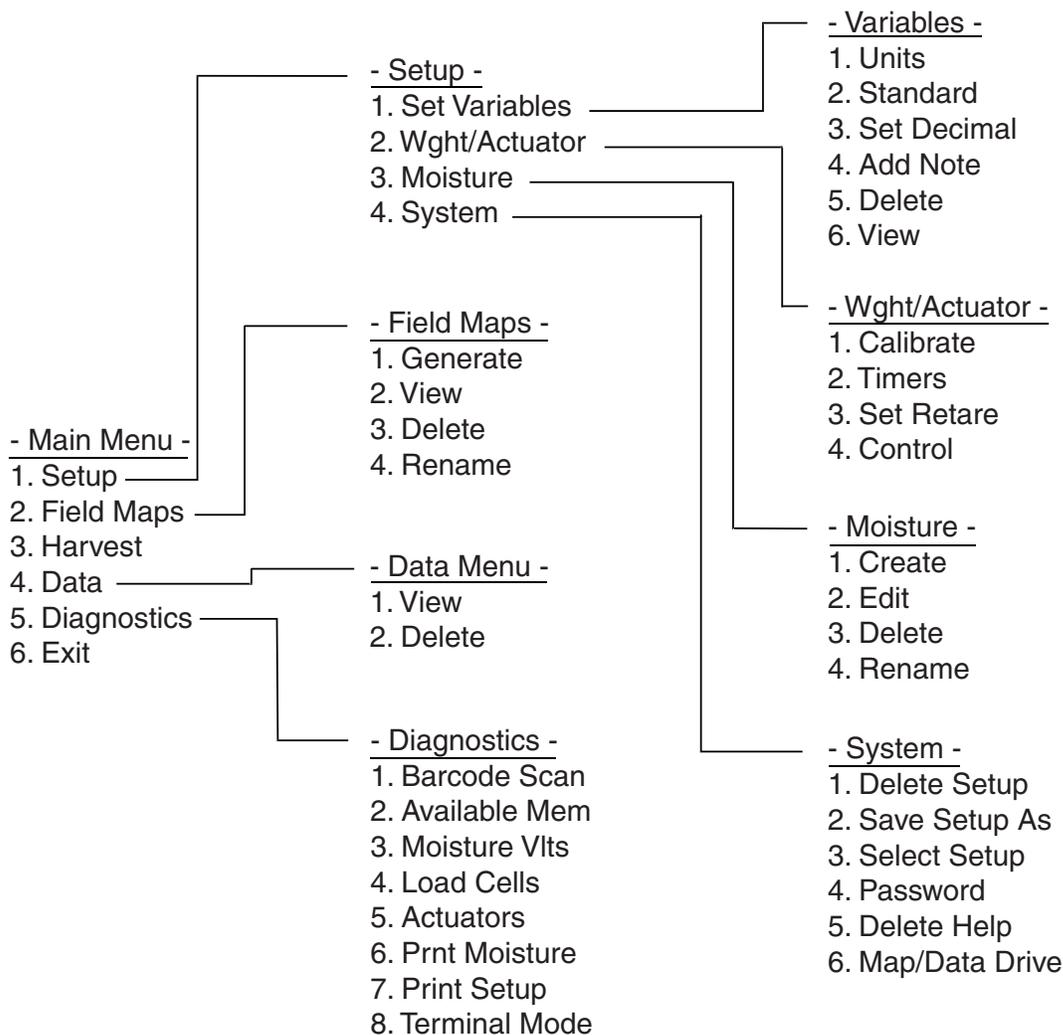
Purpose for this Document

This addendum provides the information needed to setup and operate the HD3Cell-DOS software. This addendum is to be used with the HDRB-DOS User's Manual.

▲ Introduction

The HDRB-DOS Plot Harvest Data program and the HD3Cell-DOS Plot Harvest Data Program are very similar in function. The key difference is that the HDRB-DOS uses 2 Load Cells to measure plot weight and test weight separately. The HD3Cell-DOS uses only plot weight with the option of using 1 to 3 Load Cells for measuring.

This addendum will explain the differences found in the HD3Cell-DOS System. In this addendum, the term "Bucket(s)" is replaced with "Actuator(s)."

When running the HD3Cell-DOS Program, refer to the HDRB-DOS User's Manual, outlined in Chapter 3, to receive the information you will need to set up your Plot Harvest Data Forage System. The figure below shows the Main Menu and options available in the HD3Cell-DOS Program.

- Main Menu -
1. Setup
2. Field Maps
3. Harvest
4. Data
5. Diagnostics
6. Exit

- Setup -
1. Set Variables
2. Wght/Actuator
3. Moisture
4. System

- Field Maps -
1. Generate
2. View
3. Delete
4. Rename

- Data Menu -
1. View
2. Delete

- Diagnostics -
1. Barcode Scan
2. Available Mem
3. Moisture Vlts
4. Load Cells
5. Actuators
6. Prnt Moisture
7. Print Setup
8. Terminal Mode

- Variables -
1. Units
2. Standard
3. Set Decimal
4. Add Note
5. Delete
6. View

- Wght/Actuator -
1. Calibrate
2. Timers
3. Set Retare
4. Control

- Moisture -
1. Create
2. Edit
3. Delete
4. Rename

- System -
1. Delete Setup
2. Save Setup As
3. Select Setup
4. Password
5. Delete Help
6. Map/Data Drive

▲ Weight/Actuator Menu

The Wght/Actuator section of the Setup Menu is the first area with alterations, from the HDRB-DOS User's Manual, that this addendum will discuss.

Calibrate

To calibrate your forage system, complete the following steps:

1. Select through the *Main Menu│Setup│Wght/Actuator* screens, select the *Calibrate*, and press *Enter*.

2. Find a precision weight to place directly above each load cell. This weight must be between 50 - 90% of each load cells maximum load capacity.

*Caution: When the weight of the bucket or conveyer system is already on the load cells, **Do Not** overload the load cells. Decide how much weight is on each Load Cell and use it with your calibration weight to reach the 50 - 90% capacity required.*

3. Key in the calibration weight and press *Enter*.

```
Please Enter the
Calibration
Weight...
        0.00


Enter continues,
ESC to Exit.
```

5. Key in the number of load cells you are using and press *Enter*.

```
Enter the #
of Active
Load Cells, 1-3
      0


0-2 for Manual
Calibration
```

If you are using three load cells, key in 3, press *Enter*, and complete the steps under *3 Cell Automatic Calibration* (found on the next page). If you are using 1-2 load cells, go to the section entitled *Load Cell Manual Calibration* (in this addendum).

Note: This program is for 1-3 load cells only. If you have 4 load cells, you may combine two of them together using a load cell adder box.

3 Cell Automatic Calibration

When using three load cells, the HD3Cell-DOS program will automatically calculate the load cells calibration multiplier for you. When calibrating, use the correct load cell corresponding with the correct screen prompt. These load cells are determined by the name of the port on the HM-420 bF Box (i.e. the *Plt* prompt = the load cell plugged into the port labeled *Plot*).

Also, it is important that you place the weight centered directly over each load cell. Higher accuracy levels are attained by ensuring as exact weight transfer to each individual load cell.

To calibrate the load cell, complete the following steps:

1. Follow the screen prompt by removing the weight from the load cells and pressing *Enter*.

Note: It is not necessary to remove the weighing platform from the load cells.

```
Empty Load Cells
Let Settle, Then
Press ENTER


Plt: 0.028
Tst: 0.026
Aux: 0.222
```

2. Place the sample weight directly above the Plot load cell and press *Enter*.

```
Center Cal Wt on
<PLOT> Load Cell
Then Press ENTER


Plt: 0.416
Tst: 0.026
Aux: 0.222
```

3. Place the sample weight directly above the Test load cell and press *Enter*.

```
Center Cal Wt on
<TEST> Load Cell
Then Press ENTER


Plt: 0.028
Tst: 0.414
Aux: 0.222
```

4. Place the sample weight directly above the Aux load cell and press *Enter*.

```
Center Cal Wt on
 <AUX> Load Cell
Then Press ENTER


Plt: 0.028
Tst: 0.026
Aux: 0.610
```

5. Press *Enter* for each multiplier to advance past the following screen.

```
Cell   mV    lb/kg



Plt:         23.60
Tst:         24.01
Aux:          6.03
```

6. Check your calibrations using the following screen, press *Esc* to exit out of this screen.

```
Cell   mV    lb/kg



Plt: 1.000  1.00
Tst: 1.000
Aux: 1.000
```

If the weight is incorrect while there is no weight on the load cell, press F6 (Blue key + F1) to retare the total weight.

Note: Press Enter to toggle between the mV and multiplier screens.

Your load cells are now calibrated and ready to use. To check the calibration, use the *Diagnostics* menu as explained later in this addendum. If further calibration is necessary refer to manual the calibration section.

Load Cell Manual Calibration

When using 1 or 2 load cells, complete the following steps:

1. Write down the voltage reading for each load cell (without any weight on them except the bucket or conveyer belt assembly).

2. Place the calibration weight directly above the Plot load cell and write down the voltage readings.

3. Perform the above step for the Test and Aux load cells.

4. Input the voltage reading you have recorded into the following formula to get the calibration multiplied for each load cell. Calibration Weight / (V2-V1) = Multiplier. V2 = voltage reading with weight. V1 = voltage reading with no weight.

5. Press *Enter* to get the *multiplier* screen and insert the calculated multipliers for each of the load cells used. A 0.00 entry is used for ports with no load cell.

```
Cell   mV    lb/kg



Plt:          23.60
Tst:          24.01
Aux:           0.00
```

6. To fine-tune the calibration use the following formula:

$$\text{New Multiplier} = \frac{\text{Actual Weight}}{\text{Measured Weight}} \times \text{Multiplier}$$

Repeat this step for each load cell until the calibration is correct.

Note: It is recommended that you retare the system between each calibration process. This can be sone by pressing F6.

You are now calibrated to begin harvesting.

Timers

The Test Delay function in the Timers option found in *Main Menu │ Setup │ Wght/Actuator │ Timers* menu has been removed from the HD3Cell-DOS program because it is not needed for harvesting forage.

Set Retare

In the *Set Retare* option of HD3Cell-DOS program, an Auto-Tare function has been added. When enabled (Yes), this option will retare after every plot harvested automatically. To empty the bucket the user can press F6 (Retare). This will cycle the bucket, then zero out the

weight readings. When it is disabled (No), it will operate as outlined in the Harvest Data User's Manual.

To activate Auto-Tare complete the following steps:

1. Select *Setup│Wght/Actuator│Set Retare* and press Enter.
2. Press left or right on the arrow key to select *YES* to Activate the Auto-Tare or *NO* to disable it and press Enter.

```
Auto-Tare
Active: YES


Enter Tare
Margin: 1.00
+/- Pounds
```

Note: Selecting Yes on the Auto-Tare feature disables the actuators. To manually operate, change the auto/manual switch on the HM-401 SCCU to Manual, then use the plot switch to control the actuator.

3. Key in the Tare Margin and press *Enter*. Refer to the HDRB-DOS User's Manual for more detail.

Your Auto-Tare feature is now activated and ready for harvest.

Control

The following options have been changed in the *Control* menu, found in *Setup│Wght/Actuator│Control* menu:

- Hopper Actuator defaulted to none
- Test Actuator defaulted to none
- Plot Actuator defaulted to Hydraulic
- All Limit Switches disabled

Note: Please refer to the HDRB-DOS Manual for more detailed information.

▲ Harvest

The following are alterations that have occurred in the Harvest section of the HD3Cell-DOS program:

- Automatic bucket retare when entering Harvest Mode
- Removed the Test Weight in Harvest screen
- Defaulted the Moisture Note Variable to none
- Updated Auto-Tare so that when it is set to yes, F6 (retare) will automatically open then close the actuator and reset the weight to zero.

▲ Diagnostics

The Load Cells feature in *Diagnostics* menu has changed. We have added a third load cell (aux) and a *Total Weight* reading to the screen.

```
Cell   mV    lb/kg



Plt: 1.000   1.00
Tst: 1.000
Aux: 1.000
```

Note: This is the same screen as the millivolts and total weight for the combination of the three load cells when calibrating. The purpose for showing this screen in the Diagnostics Load Cells feature is to insure that the load cells are installed and wired properly. It also helps troubleshoot faulty load cells.

▲ Additional Information

If you need additional information after following this addendum and the HDRB-DOS User's Manual, please contact our Customer Service Department.

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