
Users Guide to

form-U-net Blending

By Software Solutions Integrated, LLC

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Contents

| | |
|--|----------|
| Intro to form-U-net | 1 |
| Overview | 1 |
| Creating a Blend | 3 |
| Overview | 3 |
| Formulation Items..... | 3 |
| Items | 3 |
| Creating Material Groups | 3 |
| Generating Blends | 3 |
| Least Cost Formulation | 3 |
| Formulate by Lbs/acre or by Grade (% Analysis) | 4 |
| Menu Options | 5 |
| Overview | 5 |
| Formulation | 5 |
| Material Groups..... | 5 |
| Item Information..... | 5 |
| Customer Information | 6 |
| Settings | 6 |
| Help | 6 |
| Formulation | 6 |
| Reset Formulation | 8 |
| Formulation Settings | 8 |
| Saved Formulations | 10 |
| Customer Settings..... | 12 |
| Print | 12 |
| Submit Request..... | 17 |
| Save Formulation | 18 |
| Save & Export Formulation..... | 18 |
| Material Groups | 19 |
| My Group Settings | 19 |
| Edit Data..... | 26 |
| Edit Activities..... | 30 |
| Edit Restrictions | 32 |
| Edit Information | 35 |
| Item Information..... | 40 |
| Overview | 40 |
| Edit Items | 41 |
| Customer Information..... | 47 |
| Settings | 49 |
| Preferences Tab | 49 |
| Profile Tab..... | 54 |
| Utilities Tab..... | 55 |
| Agvance API Tab | 56 |

| | |
|---------------------------------|----|
| Help | 57 |
| Help Information Tab | 57 |
| Support Information Tab | 58 |
| User Info & Utilities Tab | 58 |

form-U-net Updates 61

| | |
|--------------------------|----|
| Latest Updates | 61 |
| November 9, 2016 | 61 |
| Previous Updates | 61 |
| November 1, 2016 | 61 |
| September 30, 2016 | 61 |
| September 2, 2016 | 61 |
| July 22, 2016 | 62 |
| July 1, 2016 | 62 |
| June 10, 2016 | 62 |
| May 20, 2016 | 62 |
| May 4, 2016 | 63 |
| April 8, 2016 | 63 |
| March 18, 2016 | 63 |
| March 2, 2016 | 64 |
| February 9, 2016 | 64 |
| December 15, 2015 | 64 |
| November 17, 2015 | 65 |

Intro to form-U-net

Overview

The form-U-net program is a powerful formulation program to create dry or liquid fertilizer, chemical, suspension, horticultural, seed, and feed blends. Blends may be generated to fill a requested analysis, such as nutrient recommendations; by direct requesting an amount of an item at a specified rate per acre; or by specifying a total amount needed for a mini-bulk. Formulations are made with set constraints on each nutrient of every item in the Material Group. This program is accessed from any computer with an internet connection.

In form-U-net, the items, rates, and prices may be viewed and changed on the *Formulation* screen for maximum flexibility. Batch size and job size, *Acres* or *Tons*, may also be easily adjusted. A Mixing Sheet is available for the blend operators' use in creating the blends.

Creating a Blend

Overview

The form-U-net program offers quick setup for all kinds of blends, critical information of the blend, and the ability to easily edit blends on the screen. Careful preparation in setting up items and their details, Material Groups, and pricing is required before attempting to process a blend.

Formulation Items

Items

Items must be accurately set up according to their physical and chemical composition. This is crucial to generating accurate blend characteristics, such as density, rates, analysis, price, etc.

Creating Material Groups

Material Groups are subsets of items used for blending. These are collections of dry and/or liquid items to use throughout the year, for a season, for specific crops or territories, etc.

Generating Blends

Least Cost Formulation

Least Cost Formulation uses a search algorithm to examine all available combinations of items in the selected Material Group to find the least expensive mix that meets all the specific and implied restrictions. Least Cost Formulation finds item combinations that over-formulate individual nutrients in order to take advantage of less expensive ingredients.

The only additional information required by form-U-net to effectively use Least Cost Formulation is accurate cost information on items used in the Material Group. A missing or inaccurate cost could make an item overly attractive or prohibitive to the search algorithm and lead to non-optimal results.

If requested nutrient components are not represented in the chosen Material Group, a warning appears stating the request could not be filled. Least Cost Formulation

always searches for an exact match of the requested nutrients, subject to the restrictions in place at the time, which meets the minimum guarantees of the request.

Formulate by Lbs/acre or by Grade (% Analysis)

The form-U-net program is designed to easily create formulations based upon soil test results, University recommendations, crop consultants, etc. Formulations may be made as requests for Lbs of nutrient types per acre as well as the manufacture of specific grades of analysis, such as 13-13-13-12S.

Menu Options

Overview

The form-U-net home page provides the option to choose from menu selections or shortcut buttons located at the top of the window. Individual menu options are available in detail on the following pages.



Formulation

The *Formulation* area offers quick and easy results of blend requirements requested by the acre or by analysis (grade). Simply type in the quantity of each nutrient desired plus the number of acres or the quantity of analysis, and click on the **Submit Request** button. The *Formulation Results* section displays the blend's price per ton, mixing and spreading charges, acre prices and quantities, volume, etc. The *Mix Results* grid shows the quantities of the selected items required per batch. A *Margin Information* grid is available to non-restricted users to view costs, margins, and prices by item used in the blend.

Material Groups

The *Material Groups* section allows selecting and editing features within the Material Groups. Material Groups are subsets of inventoried items used in making blends. An unlimited amount of groups may be set up. These groups are sets of dry items, liquid items, chemicals, etc. Some groups are setup for specific seasonal needs when certain items are preferred over others.

Item Information

This area stores the detail information of the items. The *Item Code*, *Item Description*, physical and chemical characteristics, units of measure, cost, prices, etc. are entered here.

Customer Information

Customer information such as name, addresses, status, etc. is entered in this area. Customers may be specified with their price level, address types, etc.

Settings

Select *General Preferences* and *Printing Preferences* on the *Preferences* tab. Setup contact information, and passwords using the *Profile* tab, and use the *Utilities* tab to manage the pricing and margins of items.

Help

The Help Manual, along with the Latest Updates made to form-U-net, may be accessed from this window. SSI Support may also be contacted via GoToAssist and/or TeamViewer. A *User Account Information/Data Utilities* section is also available to edit account settings.

Formulation

Upon opening form-U-net, the Formulation screen displays. A formulation may be created, saved, and/or exported.

Formulation Setup:

Material Group: MYBLEND Formulation Customer(s) Selected ▲

Material System: Dry Mixing

Default Price Level: 1

Current Price Level: 1

Reset Formulation Formulation Settings ▼ Saved Formulations ▼ Customer Settings ▼ Print ▼

Submit Request Save Formulation Save & Export Formulation

| Formulation Request | | Per Acre | Analysis |
|---------------------|---|----------|----------|
| Nitrogen | > | -- | Lb. 0.00 |
| Phosphate | > | -- | Lb. 0.00 |
| Potash | > | -- | Lb. 0.00 |
| Sulfur | > | -- | Lb. 0.00 |
| Magnesium | > | -- | Lb. 0.00 |
| Zinc | > | -- | Lb. 0.00 |
| Boron | > | -- | Lb. 0.00 |
| Calcium | > | -- | Lb. 0.00 |

Acres: 1.0 Rate Per Acre: 0.0

Batches: 1.0 Max Lbs/Batch: 2000.0

Formulation Information

Description/Comments:

Enter comments here...

Formulation Results ▲

Mixed Item Results ▲

Non-Mixed Item Results ▲

Margin Information ▲

To create a blend, first select the Material Group in *Formulation Settings*. For this example, the group, *MyBlend*, is chosen. Notice the nutrients listed in the *Formulation Request* grid. The *Per Acre* label above the quantities shows this is in *Acre* mode. To switch to *Grade (Analysis)* mode, select the *Formulation Settings* drop down menu and choose accordingly. In *Grade* mode, the label displays a % symbol.

Next, click in the quantity field for *Nitrogen* and type '100', and select the **Enter** key on the keyboard. The cursor moved down to the *Phosphate* quantity field. There, type in '50' and select **Enter**. Now enter '50' for *Potash* and select **Enter**, and then click the **Submit Request** button just above the *Formulation Request* grid. The *Formulation* screen should appear (like the one below).

The screenshot displays the 'Formulation Request' and 'Formulation Results' interface. The 'Formulation Request' section includes a table with columns for 'Per Acre' and 'Analysis' for various nutrients. The 'Formulation Results' section shows a summary of costs and analysis. The 'Mixed Item Results' section shows a table of item mix names, per batch quantities, and units. The 'Margin Information' section shows a table of item codes, costs, margins, and prices.

| Formulation Request | | | |
|---------------------|----------|----------|-------|
| | Per Acre | Analysis | |
| Nitrogen | 100.00 | Lb. | 27.26 |
| Phosphate | 50.00 | Lb. | 13.63 |
| Potash | 50.00 | Lb. | 13.63 |
| Sulfur | -- | Lb. | 0.00 |
| Magnesium | -- | Lb. | 0.00 |
| Zinc | -- | Lb. | 0.00 |
| Boron | -- | Lb. | 0.00 |
| Calcium | -- | Lb. | 0.00 |

| Formulation Results | | | |
|-----------------------------|----------------|--|-----------|
| Mixed Fert | \$517.57 / Ton | | \$517.57 |
| Spreading | | | \$0.00 |
| Mixing Charge | | | \$0.00 |
| Applied | \$517.57 / Ton | | \$517.57 |
| Other | | | \$0.00 |
| Total | | | \$517.57 |
| Analysis: 27.26-13.63-13.63 | | | |
| 5.5 Acres | \$94.95 / Acre | | |
| 1.000 Ton | 1 Batch | | |
| 5.5 Acres/Batch | | | |
| 367 Lbs/Acre | | | |
| 6.64 CuFt /Acre | | | |
| 55.3 Lbs/CuFt | | | 36.2 CuFt |

| Mixed Item Results | | |
|--------------------|-----------|------|
| Item Mix Name | Per Batch | Unit |
| DAP (18-46-0) | 593 | Lb. |
| UREA (46-0-0) | 953 | Lb. |
| 0-0-60 | 454 | Lb. |
| Product | 2000 | Lb. |

| Margin Information | | | | |
|--------------------|----------|---------|----------|------|
| Item Code | Cost | Margin | Price | Edit |
| 1184600 | \$450.00 | 19.64 % | \$560.00 | |
| 1460000 | \$350.00 | 20.45 % | \$440.00 | |
| 1000060 | \$500.00 | 20.00 % | \$625.00 | |
| Product | \$413.70 | 20.07 % | \$517.57 | |

This displays the quantities of the items needed to create a 2,000 Lb batch to cover 5.349 acres. To use this blend and calculate the need for 40 acres, change the 5.349 in the *Acres* box to '40' and click **Submit Request**. It calculates 8 batches of 1,834 Lbs each are needed to do the job. More information about *Max Lbs/Batch* is found at "[Edit Information](#)" on page 35.

Selecting the **Edit** button in the *Formulation Results* grid displays the *Adjust Mixing and Spreading Charges* window, which allows the Mixing and Spreading Charges to be manually adjusted for an active formulation. The *Use Custom Prices* option must

be selected to make changes to the Mixing and Spreading Charges on this window. Select **Continue** to save these changes.

Adjust Mixing & Spreading Charges

Use the fields below to override the default Mixing & Spreading charges for this formulation request only.

Use Custom Prices

Mixing & Spreading Charges:

| | | |
|---------------------------|--------------------------------|----------------|
| Mixing Charge: | <input type="text" value="0"/> | (Default: \$0) |
| Spreading Charge / Acre: | <input type="text" value="0"/> | (Default: \$0) |
| Spreading Charge / Batch: | <input type="text" value="0"/> | (Default: \$0) |
| Spreading Charge / Ton: | <input type="text" value="0"/> | (Default: \$0) |

Do you want to continue with these settings?

Selecting the **Edit** button in the *Margin Information* grid displays the *Item Code*, *Cost*, *Margin*, and *Price* for the selected item. The *Margin* and *Price* may be edited at this window and saved.

Edit

| | | | |
|--------------------------------------|--|---|--|
| Item Code: | Cost: | Margin: | Price: |
| <input type="text" value="1184600"/> | <input type="text" value="\$450.00"/> ▲▼ | <input type="text" value="19.64 %"/> ▲▼ | <input type="text" value="\$560.00"/> ▲▼ |

The available options for a formulation are explained below.

Reset Formulation

This clears any data from the *Formulation* screen and resets it for the next blend.

Formulation Settings

Change Material Group

A Material Group may be selected to be used for the formulation.

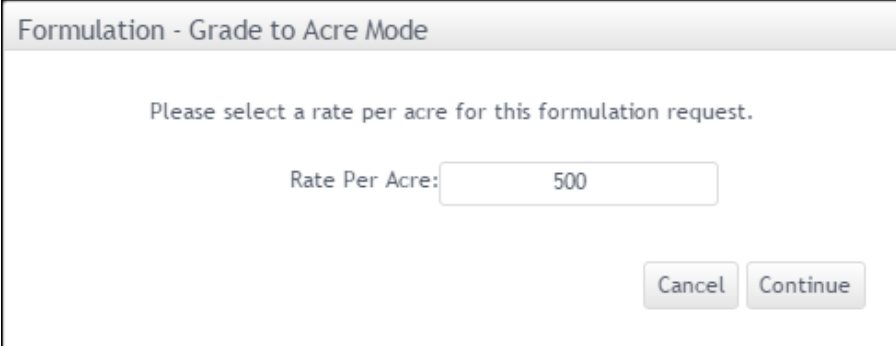
Change Price Level

A *Price Level* may be selected to be used with the formulation.

Switch to Acre Mode

This option switches from nutrients per ton (*Grade mode*) to nutrients requested per acre (*Acre mode*). The label above the column displays *Per Acre*.

When switching from *Grade* to *Acre* mode with an active formulation, a window displays to choose the *Rate Per Acre* for the formulation.



Formulation - Grade to Acre Mode

Please select a rate per acre for this formulation request.

Rate Per Acre:

Cancel Continue

Switch to Grade Mode

This option switches from nutrients per acre (*Acre mode*) to nutrients requested per ton (*Grade mode*). The label above the column displays %.

Switch to Itemize Mode

This mode allows requesting a specific quantity of individual items in the Material Group to be used in the formulation. There is an option to *Itemize by Acre* and to *Itemize by Ton*. This is useful, for example, if the customer has a spinner buggy and wants 4 tons of a blend that is half DAP and half Urea. (A screen shot is shown below.)

Reset Formulation | Formulation Settings ▾ | Saved Formulations ▾ | Customer Settings ▾ | Print ▾

Submit Request | Save Formulation | Save & Export Formulation

Formulation Request

| | | Qty/Acre | Lbs | Qty/Bat |
|-----------------|---|----------|-----|---------|
| DAP (18-46-0) | > | 1000 | Lbs | 1000 |
| MAP (11-52-0) | > | 0.0 | Lbs | 0 |
| Triple (0-46-0) | > | 0.0 | Lbs | 0 |
| UREA (46-0-0) | > | 1000 | Lbs | 1000 |
| AmmoSulf 21-0-0 | > | 0.0 | Lbs | 0 |
| 0-0-60 | > | 0.0 | Lbs | 0 |
| 0-0-22 | > | 0.0 | Lbs | 0 |
| 36Zn 20S | > | 0.0 | Lbs | 0 |
| 14.3% B | > | 0.0 | Lbs | 0 |
| Filler | > | 0.0 | Lbs | 0 |

Acres: Rate Per Acre:

Batches: Max Lbs/Batch:

Formulation Information

Description/Comments:
 Enter comments here...

Formulation Results

| | | |
|---------------|----------------|-----------------|
| Mixed Fert | \$500.00 / Ton | \$500.00 |
| Spreading | | \$0.00 |
| Mixing Charge | | \$0.00 |
| Applied | \$500.00 / Ton | \$500.00 |
| Other | | \$0.00 |
| Total | | \$500.00 |

Analysis: 32.00-23.00-0.00

1.0 Acres \$500.00 / Acre
 1.000 Ton 1 Batch
 1.0 Acres/Batch
 2000 Lbs/Acre
 36.22 CuFt /Acre

55.2 Lbs/CuFt 36.2 CuFt

Mixed Item Results

| Item Mix Name | Per Batch | Unit |
|---------------|-----------|------|
| DAP (18-46-0) | 1000 | Lb. |
| UREA (46-0-0) | 1000 | Lb. |
| Product | 2000 | Lb. |

Non-Mixed Item Results

Margin Information

| Item Code | Cost | Margin | Price | Edit |
|-----------|----------|---------|----------|------|
| I184600 | \$450.00 | 19.64 % | \$560.00 | |
| I460000 | \$350.00 | 20.45 % | \$440.00 | |
| Product | \$400.00 | 20.00 % | \$500.00 | |

Saved Formulations

Save Current Formulation

After the formulation is entered and a customer is chosen for the blend, the formulation may be saved. The formulation must be reset before a new formulation is created.

Export Saved Formulation to Agvance

The saved formulation may be exported to create a Blend Ticket in Agvance Blending. These saved formulations can be exported multiple times to different customers and fields. Formulations that have been exported display a **View Export Info** button in the *Select a Saved Formulation* grid. Selecting this button displays a list of the Agvance Blend Tickets exported from that particular formulation.

10 • Menu Options

Users Guide to form-U-net Blending

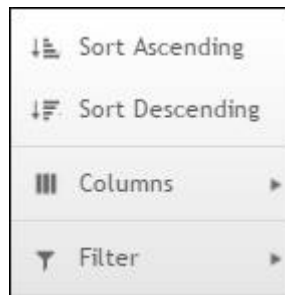
Select a Saved Formulation

Save Grid Layout

| | ID | Date | Export Info | Mate... | Formu... | Number... | Mai... | Mailing |
|--------|-------|------------|------------------|----------|------------|--------------|--------|---------|
| Select | 00001 | 01/05/2016 | Not Exported | SOLUTION | Grade Mode | 1 Tons | 510038 | Charle |
| Select | 00002 | 01/06/2016 | Not Exported | MYBLEND | Acre Mode | 29,206 Acres | 510038 | Charle |
| Select | 00003 | 01/06/2016 | View Export Info | MYBLEND | Acre Mode | 5.451 Acres | 1BakLa | Larry E |
| Select | 00004 | 01/06/2016 | View Export Info | MYBLEND | Acre Mode | 5.451 Acres | 1AndBa | Barry A |
| Select | 00005 | 01/06/2016 | Not Exported | MYBLEND | Acre Mode | 9.2 Acres | 1Cashs | Cash S |
| Select | 00006 | 01/06/2016 | Not Exported | MYBLEND | Acre Mode | 9.2 Acres | 1BakLa | Larry E |
| Select | 00007 | 01/06/2016 | Not Exported | MYBLEND | Acre Mode | 9.2 Acres | 1BakLa | Larry E |
| Select | 00008 | 01/06/2016 | Not Exported | MYBLEND | Acre Mode | 9.2 Acres | 1BakLa | Larry E |
| Select | 00009 | 01/06/2016 | View Export Info | MYBLEND | Acre Mode | 9.2 Acres | 1BakLa | Larry E |
| Select | 00010 | 01/06/2016 | View Export Info | MYBLEND | Acre Mode | 9.2 Acres | 1BakLa | Larry E |

1 2 10 items per page 1 - 10 of 11 items

Selecting the arrow in the column heading displays a dropdown menu to sort the column in ascending order or descending order, to choose the columns to display in the grid, or to filter for certain information.



Choosing *Columns* displays a list of the available columns to optionally include in the grid.

Clicking *Filter* opens the filter dialog window.

Show items with value that:

Is equal to

And

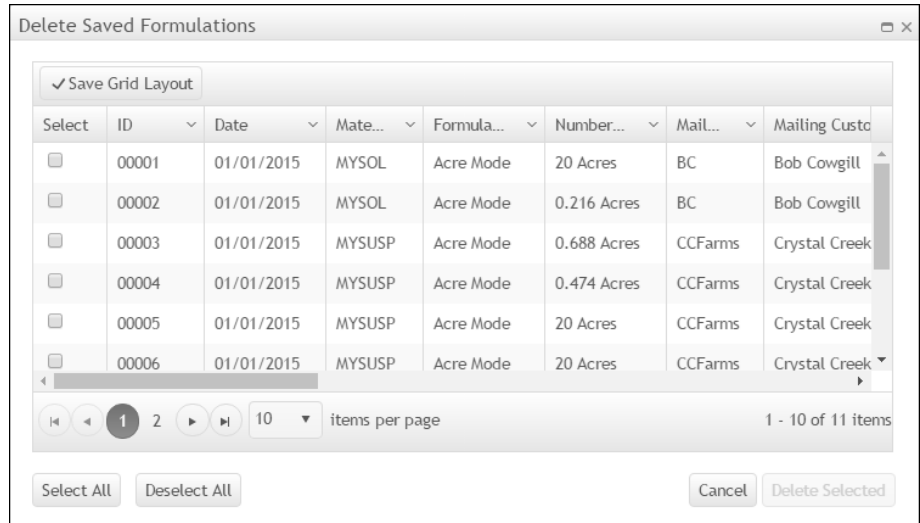
Is equal to

Filter Clear

Is equal to defaults into the first and third dropdown menu filters. Other choices include *Is not equal to*, *Starts with*, *Contains*, *Does not Contain*, and *Ends with*. More complex filtering is also available using the *And / Or* drop down menu.

Delete Saved Formulations

Saved formulations may be deleted by selecting the *Delete Saved Formulations* option. Choose the formulations to be deleted from form-U-net, and select **Delete Selected**.



Customer Settings

3 menu choices are available here:

1. Select an Existing Customer For This Formulation.
2. Create a New Customer For This Formulation.
3. Remove Selected Customer For This Formulation.

Under the first two choices, the user has the option to choose *Mail To Customer*, *Ship To Customer*, or *Mail To and Ship To Customer*. These designations are explained in the “[Customer Information](#)” on page 47.

Print

There are five print options available.

Print a Formulation Mixing Sheet

The form-U-net Mix Sheet contains all the information the plant operator needs to create the blend. (An example is shown below.)

Mix Sheet

4/8/2016

140 E South First St
Shelbyville, IL 62585
217-774-2105

Price : \$103.36 \$/Acre (estimate)
Acres : 4.2 Acres
Rate : 476.0 Lbs/Acre

Material System is Dry Mixing
Density = 55.95 Lb./Cu. Ft.)

21-15-10

| <u>Material Name</u> | <u>Percent</u> | <u>Units/Batch</u> | <u>Scale</u> | <u>Actual</u> |
|----------------------|----------------|--------------------|--------------|---------------|
| | | | (Lbs) | |
| Triple (0-46-0) | 33.35 | 667.00 Lb. | 667 | _____ |
| UREA (46-0-0) | 45.65 | 913.00 Lb. | 913 | _____ |
| 0-0-50 | 21.00 | 420.00 Lb. | 420 | _____ |

Batch Total 2000.00 Lbs

1 Batch

Print a Formulation Quote Sheet

The form-U-net Quote Sheet prints a record of the prices for the blend and the quantities of the items used in making the blend. (An example is shown below.)

Quote Sheet

4/8/2016

140 E South First St
Shelbyville, IL 62565
217-774-2105

Price : \$103.36 \$/Acre (estimate)
Acres : 4.2 Acres
Rate : 476.0 Lbs/Acre

| Description | Code | Quantity | Unit Price | Item Total |
|-----------------------------|---------|-----------|------------|------------|
| Mixed Fertilizer (21-15-10) | | 1 Ton | \$434.30 | \$434.13 |
| Triple (0-46-0) | 1004600 | 0.334 Ton | | |
| UREA (46-0-0) | 1460000 | 0.456 Ton | | |
| 0-0-50 | 1000050 | 0.210 Ton | | |
| Total Price | | | | \$434.13 |

21-15-10

Estimated Nutrient Analysis

| | |
|----------------------------|--------|
| Total Nitrogen (N) | 21.00% |
| Available Phosphate (P2O5) | 15.00% |
| Soluble Potash (K2O) | 10.00% |
| Total Calcium (Ca) | 6.34% |
| Total Sulfur (S) | 0.33% |

Print a Formulation File Sheet

The form-U-net File Sheet prints all information that currently prints on both the Mix Sheet and the Quote Sheet. (An example is shown below.)

File Copy Sheet
4/8/2016

140 E South First St
Shelbyville, IL 62565
217-774-2105

Price : \$103.36 \$/Acre (estimate)
Acres : 4.2 Acres
Rate : 476.0 Lbs/Acre

Material System is Dry Mixing
Density = 55.95 Lb./Cu. Ft.)

21-15-10

| Material Name | Percent | Units/Batch | Scale | Actual |
|--------------------|---------|-------------|--------------------|--------|
| | | | (Lbs) | |
| Triple (0-46-0) | 33.35 | 667.00 Lb. | 667 | _____ |
| UREA (46-0-0) | 45.65 | 913.00 Lb. | 913 | _____ |
| 0-0-50 | 21.00 | 420.00 Lb. | 420 | _____ |
| Batch Total | | | 2000.00 Lbs | |

1 Batch

| Description | Code | Quantity | Unit Price | Item Total |
|-----------------------------|---------|-----------|------------|-----------------|
| Mixed Fertilizer (21-15-10) | | 1 Ton | \$434.30 | \$434.13 |
| Triple (0-46-0) | I004600 | 0.334 Ton | | |
| UREA (46-0-0) | I460000 | 0.456 Ton | | |
| 0-0-50 | I000050 | 0.210 Ton | | |
| Total Price | | | | \$434.13 |

21-15-10

| Estimated Nutrient Analysis | |
|-----------------------------|--------|
| Total Nitrogen (N) | 21.00% |
| Available Phosphate (P205) | 15.00% |
| Soluble Potash (K20) | 10.00% |
| Total Calcium (Ca) | 6.34% |
| Total Sulfur (S) | 0.33% |

Print Multiple Documents

Multiple Mix Sheets, Quote Sheets, or File Sheets may be printed by selecting the *Print Mix Sheet*, *Print Quote Sheet*, and/or *Print File Copy* options and choosing the *Number of Copies* to print for each. This window may also be setup to default print a certain number of copies by selecting the **Show Preferences** button on the *Settings / Preferences* tab. (An example is shown below.)

Print Multiple Documents

Your default settings are listed below.

To change these default settings for future print operations, navigate to the Preferences tab of the Settings view.

Print Mix Sheet Number of Copies: 1

Print Quote Sheet Number of Copies: 0

Print File Copy Number of Copies: 0

Cancel Print

Print a Sheet from a Saved Formulation

The formulation may optionally be saved after assigning a formulation to a customer. A customer selection is required to save. (An example of the selection window is below.)

Select a Saved Formulation

Save Grid Layout

| Print Sheet(s): | ID | Date | Mate... | Formula... | Number... | Maili... | Mailing |
|----------------------|-------|------------|---------|-----------------|-------------|----------|-----------|
| Mix Quote File | 00001 | 09/01/2015 | MYBLEND | Acre Mode | 4,201 Acres | KN | Kristin N |
| Mix Quote File | 00002 | 09/01/2015 | MYBLEND | Acre Mode | 3,966 Acres | 1CowBo | Bob Cov |
| Mix Quote File | 00003 | 09/01/2015 | MYBLEND | Acre Mode | 4,113 Acres | 1BakLa | Larry Ba |
| Mix Quote File | 00004 | 09/01/2015 | MYBLEND | Acre Mode | 5,069 Acres | 1AndBa | Barry An |
| Mix Quote File | 00005 | 09/01/2015 | MYBLEND | Itemize in A... | 2000 Acres | 1Cryst | Crystal C |

1 - 5 of 13 items 5 items per page

Each saved formulation has its own row, and a Mix Sheet, Quote Sheet, or File Sheet may optionally be printed.

Print Item Pricing Report

The Item Pricing Report prints the items' pricing information.

Print Item Pricing Report

Select the desired options for the Item Pricing Report.

Item Type:

Show Costs:

Cancel Print

Optionally, print all items or choose one *Item Type* to display. The *Show Costs* option is available to print the items' costs on the report. (An example is shown below.)

Item Pricing Report
4/28/2016

| Code | Mix Name | Cost | Price 1 | Price 2 | Price 3 | Price 4 | Price 5 | UOM |
|----------|------------------|------------|------------|------------|------------|------------|------------|------|
| I000022 | 0-0-22 | \$800.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | Ton |
| I000025 | 0-0-25-17 S | \$400.00 | \$500.00 | \$500.00 | \$500.00 | \$500.00 | \$500.00 | Ton |
| I000050 | 0-0-50 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | Ton |
| I000060 | 0-0-60 | \$500.00 | \$625.00 | \$625.00 | \$625.00 | \$625.00 | \$625.00 | Ton |
| I000062 | 0-0-62 | \$600.00 | \$750.00 | \$750.00 | \$750.00 | \$750.00 | \$750.00 | Ton |
| I100000 | 10-0-0-10 Zn | \$800.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | Ton |
| I103000 | 10-30-0 | \$120.00 | \$150.00 | \$150.00 | \$150.00 | \$150.00 | \$150.00 | Ton |
| I103400 | 10-34-0 | \$500.00 | \$625.00 | \$625.00 | \$625.00 | \$625.00 | \$625.00 | Ton |
| I14B000 | 14.3% B | \$800.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | Ton |
| I20S36Z | 36Zn 20S | \$1,300.00 | \$1,500.00 | \$1,500.00 | \$1,500.00 | \$1,500.00 | \$1,500.00 | Ton |
| AGROPLUS | AgroPlus | \$120.00 | \$150.00 | \$150.00 | \$150.00 | \$150.00 | \$150.00 | Bag |
| AGROTAIN | Agrotain | \$50.00 | \$75.00 | \$75.00 | \$75.00 | \$75.00 | \$75.00 | Gal. |
| I210000 | AmmoSulf 21-0-0 | \$350.00 | \$420.00 | \$420.00 | \$420.00 | \$420.00 | \$420.00 | Ton |
| I120000 | AmmThio12-00-26S | \$360.00 | \$450.00 | \$450.00 | \$450.00 | \$450.00 | \$450.00 | Ton |
| I200000 | Aqua Amm 20-0-0 | \$250.00 | \$320.00 | \$320.00 | \$320.00 | \$320.00 | \$320.00 | Ton |
| AVAIL | Avail | \$225.00 | \$275.00 | \$275.00 | \$275.00 | \$275.00 | \$275.00 | Gal. |
| AVAILSD | Avail SD | \$175.00 | \$225.00 | \$225.00 | \$225.00 | \$225.00 | \$225.00 | Gal. |
| ICLAY | CLAY | \$100.00 | \$125.00 | \$125.00 | \$125.00 | \$125.00 | \$125.00 | Ton |
| I184600 | DAP (18-46-0) | \$450.00 | \$560.00 | \$560.00 | \$560.00 | \$560.00 | \$560.00 | Ton |
| EVAP | EVAP | \$25.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | Ton |
| I000000 | Filler | \$30.00 | \$38.00 | \$38.00 | \$38.00 | \$38.00 | \$38.00 | Ton |
| I93SACID | H2SO4 93% | \$520.00 | \$625.00 | \$625.00 | \$625.00 | \$625.00 | \$625.00 | Ton |
| HOTWATER | Hot Water | \$0.25 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | Ton |
| I115200 | MAP (11-52-0) | \$500.00 | \$625.00 | \$625.00 | \$625.00 | \$625.00 | \$625.00 | Ton |
| NSPHERE | NutriSphere | \$100.00 | \$125.00 | \$125.00 | \$125.00 | \$125.00 | \$125.00 | Gal. |
| NSPEREL | Nutrisphere Liq | \$125.00 | \$150.00 | \$150.00 | \$150.00 | \$150.00 | \$150.00 | Gal. |
| I005400 | Phos-acid 0-54-0 | \$800.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | \$1,000.00 | Ton |
| SURFACT | Surfactant | \$0.10 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | Gal. |
| I004600 | Triple (0-46-0) | \$600.00 | \$700.00 | \$700.00 | \$700.00 | \$700.00 | \$700.00 | Ton |
| I280000 | UAN (28-0-0) | \$280.00 | \$350.00 | \$350.00 | \$350.00 | \$350.00 | \$350.00 | Ton |
| I320000 | UAN (32-0-0) | \$315.00 | \$395.00 | \$395.00 | \$395.00 | \$395.00 | \$395.00 | Ton |
| I460000 | UREA (46-0-0) | \$350.00 | \$440.00 | \$440.00 | \$440.00 | \$440.00 | \$440.00 | Ton |
| WATER | Water | \$0.01 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | Ton |

Submit Request

After entering the quantity of nutrients desired and the acres or total quantity of items, click the **Submit Request** button to calculate the formulation.

Save Formulation

After the formulation is entered and a customer is chosen for the blend the formulation may be saved. The formulation must be reset before a new formulation is created.

Save & Export Formulation

A saved formulation may be exported to create a Blend Ticket in Agvance Blending. The **Save & Export Formulation** button becomes enabled when a customer is selected and the formulation is submitted.

Formulation Setup:

Material Group: MYSOL
Material System: Sol. 55% Poly UAN
Default Price Level: 1
Current Price Level: 1

Formulation Customer(s) Selected

Mail To Customer:
Customer ID: 1AndBa
Address: 2220 N 1000 Rd E, A...
Barry Anderson
2220 N 1000 Rd E
Assumption IL 62510
No phones available...
No emails available...

Ship To Customer:
Customer ID: 1AndBa
Address: 2220 N 1000 Rd E, A...
Barry Anderson
2220 N 1000 Rd E
Assumption IL 62510
No phones available...
No emails available...

Reset Formulation Formulation Settings Saved Formulations Customer Settings Print

Submit Request Save Formulation Save & Export Formulation

Formulation Request

| | Per Acre | Analysis |
|-------------|-----------|----------|
| Nitrogen > | 50.00 Lb. | 20.07 |
| Phosphate > | 40.00 Lb. | 16.05 |
| Potash > | 0.00 Lb. | 0.00 |
| Sulfur > | 5.00 Lb. | 2.01 |
| Zinc > | -- Lb. | 0.00 |

Formulation Results

| | | |
|---------------|----------------|----------|
| Mixed Fert | \$507.85 / Ton | \$507.85 |
| Spreading | | \$0.00 |
| Mixing Charge | | \$0.00 |
| Applied | \$507.85 / Ton | \$507.85 |
| Other | | \$0.00 |
| Total | | \$507.85 |

After the **Save & Export Formulation** button is selected, the *Export Saved Formulation* window appears. (An example is shown below.) Select the *Location ID*, *Product Set*, *Customer ID*, and *Field ID* for the Agvance Blend Ticket being created. Choose the **Export** button to export the formulation to Agvance. A message displays in the top right corner of form-U-net after the formulation is successfully exported. The Agvance Blend Ticket number is included in the message.

Export Saved Formulation

Please verify the parameters for exporting this Saved Formulation into an Agvance Blend Ticket.

Agvance Blend Ticket Setup:

Location ID*: Location Name:

Product Set*:

Agvance Customer Setup:

Customer ID*: Name:

Field ID*: Description:

Shipping Address (Optional):

Address Line 1:

Address Line 2: Address Line 3:

City: State: Zip:

Material Groups

My Group Settings

The *My Group* feature is a powerful tool that enables the Material Group to be modified to meet the specific requirements of business needs or customer demands of blends.

General Tab

Start in Grade Mode (%) – switches the mode to percentage calculations. The column label at the top of the *Formulation Request* section changes to % instead of *Per Acre*, and the numbers entered are based on a percentage. The *Analysis* column displays the percentage of each ingredient in the mix. If the program over-formulates a certain nutrient, the number in the *Analysis* column will be higher than the number entered in the % column. The total number of tons and the maximum batch size may be adjusted in the fields located below the *Formulation* table, as in *Acre* mode.

Nitrogen Detail – fills in the nitrogen breakdown by category as appropriate for the items within the Material Group. The following columns (restrictions) will be added to the *Edit Data* window:

- **Ammon** – Ammoniacal Nitrogen
- **Nitrate** – Nitrate Nitrogen
- **Urea** – Urea Nitrogen
- **OtherN** – Other Nitrogen
- **WIN** – Water Insoluble Nitrogen

- **CoatedN** – Coated Nitrogen
- **SlowN** – Slow Release Nitrogen

The percentages of each type of nitrogen are inserted into each column for all the items that have a match in the database. The percentage of total nitrogen in the *N* column also updates from the database. The amounts of the *Ammon*, *Nitrate*, *Urea*, and *WIN* will sum to the value in the *N* column. The categories of *OtherN*, *CoatedN*, and *SlowN* are a portion of the total *N*. A category for each type of nitrogen appears on the *Formulation* window, provided the *Prompt Low* option is selected in *Edit Restrictions*.

The Nitrogen Detail selection is also required for the *WIN*, *CoatedN*, and *SlowN* restrictions. This will allow requests for all or part of the nitrogen in a blend to be pulled from these Nitrogen types.

Free Sulfur – adds a free sulfur restriction/column named *WSS* in *Edit Data* provided the Material Group contains a product with a Free Sulfur analysis greater than 0. The *Prompt Low* on the *WSS* restriction will also be set so this form of sulfur may be requested on the *Formulation* screen. This is useful in applications where the quantities of free sulfur must be accurately regulated for crop safety.

Chlorine – adds a *Cl* restriction/column and inserts the percentage of chlorine for each item with a match in the database. The chlorine restriction appears on the *Formulation* screen as an upper bound with a '< ++' for the quantity of chlorine. Change the '++' value to the upper limit quantity of chlorine to be used in the blend.

Water Solubles – adds a column to the table for every nutrient with a water-soluble category and inserts the values listed in the database for each item. It includes calcium, magnesium, and all micronutrients.

Heavy Metals – adds a column for each heavy metal and inserts the quantities of heavy metals listed for each item from the database. The columns are only added if some quantity of heavy metal is present in one or more of the materials, since only a limited number of database items contain this information. The non-nutrient heavy metals are arsenic, cadmium, mercury, nickel, lead, and selenium. Each is listed in parts per million instead of a percentage. The restrictions for these elements are not automatically prompted to the *Formulation* screen. Because these elements are pollutants, an upper bound should be used.

Salt Index – adds a *Salt* column to the *Edit Data* table and inserts the salt index for each item in the group. If known for the item, the salt index must be first entered into the appropriate field in *Item Information*. Fertilizer mixes with a high salt index may damage seeds when used as starter fertilizer and placed in close proximity to the seed.

Application Rate – adds an application rate restriction to the Material Group. This allows minimum application rates for equipment to be set allowing for optimal spreading. The appropriate amount of water or filler is added to the formula to meet this requirement.

Price Level – select the price level to be used with this Material Group. The item's price levels are set in *Item Information*. This allows for more accurate price management for different markets, locations, zones, volumes, customers, etc.

Mix in Items' Mixing Units – uses the *Mixing Unit* set on the *General Info* tab of the *Item Information* window. This defaults as selected when new Material Groups are created.

Technical Tab

Material Group MYBLEND: Edit MyGroup

General **Technical** Specialty Key Products Products In Group

Product Temperature Temperature (Deg. F)

57 Process Water

140 Hot Water

77 Other Materials

38 Product Minimum

157 Product Maximum

Evaporation

Clay Balance

Ammonia Balance

Granulation

Save Changes Reset View

Product Temperature – this option is only to be used in Material Groups with the *Material System* set to *Fluid Mixing* with the *Control Total Water* setting activated on the *Edit Information* window. When *Product Temperature* is selected, review the data fields to edit the temperature variables for the water sources and the mixed item limits. Additionally, Key Products for Water, Hot Water, and Evaporation must be added to the *Key Products* tab of the Material Group. These are required for the calculations to work properly.

Material Group MYHOTMIX: Edit MyGroup

General Technical Specialty **Key Products** Products In Group

| Key Name | Item Code | Mix Name | | |
|----------|-----------|-------------|-------------|-------------|
| Water | WATER | Water | Select Item | Remove Item |
| HotWater | HOTWATER | Hot Water | Select Item | Remove Item |
| Steam | | | Select Item | Remove Item |
| Surfact | | | Select Item | Remove Item |
| Avail | | | Select Item | Remove Item |
| AvailSD | | | Select Item | Remove Item |
| NSphere | | | Select Item | Remove Item |
| NSphereL | | | Select Item | Remove Item |
| Agrotain | | | Select Item | Remove Item |
| AgroPlus | | | Select Item | Remove Item |
| Evap | EVAP | Evaporation | Select Item | Remove Item |

Save Changes Reset View

This option adds information concerning the advanced salt-out model and the product temperature model to the Material Group. This data is

used to determine the final product temperature. The *Product Minimum* tells the program to keep the final temperature of the mix above a certain degree. The amount of hot water will be increased, if present, or smaller amounts of coolers will be used, such as potassium chloride (KCl), to maintain the desired temperature. *Product Maximum* causes the program to keep the final temperature of the mix below a certain degree. This situation only occurs in hot mixing, so the program would decrease the amount of acid and ammonia used in this case.

Several columns and rows will be added to the group if they are not already present. The information for each item is also inserted into each of the new columns if the item has a match in the database.

The *Evaporation* row (assists in calculation of salt-out temperatures for solutions salting out below 32°F) should be left alone, even if no evaporation occurs.

| New Columns | Purpose |
|-------------|---------------------------------|
| HCAP | Product Temperature Prediction |
| HSOL | Product Temperature Prediction |
| HREA | Product Temperature Prediction |
| MINT | Product Temperature Control |
| MAXT | Product Temperature Control |
| Watr | Salt-out Temperature Prediction |
| 32F | Salt-out Temperature Prediction |
| 32FK | Salt-out Temperature Prediction |
| 77F | Salt-out Temperature Prediction |
| 77FK | Salt-out Temperature Prediction |

| New Rows | Purpose |
|------------------|---------------------------------|
| Hot Water | Product Temperature Control |
| Evaporation | Salt-Out Temperature Prediction |
| Heat Capacity | Product Temperature Prediction |
| Heat of Solution | Product Temperature Prediction |
| Heat of Reaction | Product Temperature Prediction |

If these rows and columns are present before activating the *Product Temperature* and the information in them has been customized, such as the salt-out factors for un-neutralized acids or adjusted heats of reaction, then the *Product Temperature* option should not be used. It will over-ride the customized data with values from the database.

Using the *Product Temperature* option is an easy way to convert an existing Material Group to the new salt-out model.

Evaporation – enables some powerful technology within form-U-net. When selected, the *Min Final Moisture %*, *Max Final Moisture %*, and *Max Evaporation %* options become available. The *Max Evaporation %* is the maximum percentage of moisture the plant is able to remove

from the product. This percentage will largely depend on the quantity and duration of heat, air flow, material characteristics, etc. in the system. Edit this number to fit the needs for the Material Group. This adds *Watr*, *MAXWATER*, and *MAXEVAP* columns or restrictions in *Edit Data* and sets *Evaporation* to '-100.00.' *Min Final Moisture %* is entered as a negative number in the *Watr* column on the *Product* row. It also sets the *Min* column in *Edit Restrictions* to the requested *Min Final Moisture %* as a positive number and sets the upper bound to zero. The *Max Final Moisture %* is set as a positive number in the *Product* row on the *Edit Data* window. It is set as a negative number in the *Min* column of the *Edit Restrictions* window. If the formulas use items that contain a higher percentage final moisture than what was set for the requested final moisture, the *Mix* window lists a quantity for evaporation. This window also shows the net quantity of the mix. For example, when running a formula with the maximum batch size at '2000,' the *Mix* window shows evaporation is '150.' The quantities of all items in the mix including evaporation will be 2,150, but the net mixed quantity will show '2,000.'

Clay Balance – used primarily for fertilizer suspensions. When selected, the *Percent Clay* textbox appears. Edit the percentage as needed. The typical clay percentage for suspension is 1.5 percent.

If a clay item is not already set up, do so before beginning this option.

The *Material System* must be set to *Suspension* on the *Edit Information* window. On the *Edit Data* window, a *CLAY* column is added. The item *CLAY* is set to 100 in that column, and the *Product* row is set to the negative *Percent Clay* amount. On the *Edit Restrictions* window, the *Min* column is set to the *Percent Clay* amount. When formulating with this group, clay is automatically included in the ingredients of the mixture.

Ammonia Balance – this option should only be used for groups that include hot mix acids and ammonia. During the neutralization reaction, significant heat is generated. The *Ammonia Balance* ensures the ammonia is completely neutralized, so the final solution is either neutral or acidic. This option inserts a *MAXA* column in the *Edit Data* table if it is not already present, and inserts the appropriate values from the database.

Ensure the solution is fully neutralized by always requesting the ammonia, rather than the phosphoric or sulfuric acid, on the *Formulation* window.

Granulation – this feature is for use by granulation plants. It is currently under development.

Specialty Tab

| Option | Value | Unit |
|--|-------|---------------------|
| <input checked="" type="checkbox"/> Stabilized N Plus | 15 | Lbs. Per Ton UAN |
| <input checked="" type="checkbox"/> Stabilized N | 4 | Qts. Per Ton |
| <input checked="" type="checkbox"/> Nutrisphere-N | 2 | Qts. Per Ton |
| <input checked="" type="checkbox"/> Nutrisphere-N Liquid | 4 | Pts. Per 99.5 Gals. |
| <input checked="" type="checkbox"/> Avail-P | 2 | Qts. Per Ton |
| <input checked="" type="checkbox"/> Avail-P SD | 4 | Pts. Per 99.5 Gals. |
| <input checked="" type="checkbox"/> Track Bags | 50 | Bag Size |
| <input checked="" type="checkbox"/> Surfactant | 2 | Pts. Per 100 Gals. |
| <input checked="" type="checkbox"/> Release Rates | | |

Stabilized N Plus – automatically sets up the Material Group to use Agrotain Plus[®]. Agrotain Plus must first be added to the inventory items for this to function properly. Also, the *Request Unit* on this item in inventory must be set to *Pound*. When selecting this option, form-U-net also selects and activates *Nitrogen Detail*. This is a requirement for form-U-net to read the urea nitrogen component of materials in the group and to add the stabilized nitrogen (STN) restriction to the group as well.

Stabilized N – automatically sets up the Material Group to use Agrotain[®]. Agrotain must first be added to inventory items for this to function properly. Also, the *Request Unit* on this item in inventory must be set to *Gallon*. When selecting this option, form-U-net also selects *Nitrogen Detail*. This is a requirement for form-U-net to read the urea nitrogen component of materials in the group and to add the STN restriction to the group as well.

Nutrisphere[®] – automatically sets up the Material Group to use Nutrisphere. Nutrisphere must first be added to the inventory items for this to function properly. Also, the *Request Unit* on this item in inventory must be set to *Gallon*. When selecting this option, form-U-net also selects *Nitrogen Detail*. This is a requirement for form-U-net to read the urea nitrogen component of materials in the group. Double-check the results to test for accuracy. *Nutrisphere[®]-N Liquid* is set up using the same method as *Nutrisphere[®]-N*.

Avail[®] – automatically sets up the Material Group to use Avail. Avail must first be added to the inventory items for this to function properly. Also, the *Request Unit* on this item in inventory must be set to *Gallon*. In the *Avail* column on the *Edit Full Data* window, items that should trigger the addition of Nutrisphere must have a value of ‘-1’ in that cell. Double-check the results to test for accuracy. *Avail[®]-P SD* is set up using the same method as *Avail[®]-P*.

Track Bags – this option is still under development.

Surfactant – allows the Material Group to be setup to automatically add surfactant to formulas. An item named *Surfactant* is automatically

added to the Material Group, and an item card is created. It is given the item code of *SURFACT*, and the *Type* is set to *Other*. For this option to work properly, the item code must not be changed. The *Mix Name* may be edited from the *Item Information / Edit* window. When the *Surfactant* box is selected, a field displays to enter the desired number of pints to add per 100 gallons of mixed product. *Surfactant* is not visible on the *Formulation* screen, but it is now part of the group. *Surfactant* will be added to every formula created using this Material Group. If *Surfactant* is no longer needed, simply edit the Material Group and uncheck the *Surfactant* checkbox.

Release Rates – adds 1, 3, 6, 9, 12, and 15 month release rates to the Material Group. The release rates must be established for the nitrogen items on the *Item Information / Edit / Technical Info* tab. The numbers in the six *Release Rate* fields must add to a total of 100 (percent). On the *Formulation* screen, specify how much of the nitrogen requirement is to be released within each appropriate *Release Rate* field. For example, if the total N for the job is 40 pounds, the user could specify that at least 20 lbs be released within 30 days and another 20 lbs be released within 90 days. The appropriate items from the group will be selected to meet those needs. If those needs cannot be met with the items within the group, form-U-net will return a ‘No Solution’ warning message.

Key Products

Key products are needed to perform some of the more specialized blending functions.

| Key Name | Item Code | Mix Name | | |
|----------|-----------|----------|-------------|-------------|
| Water | | | Select Item | Remove Item |
| HotWater | | | Select Item | Remove Item |
| Steam | | | Select Item | Remove Item |
| Surfact | | | Select Item | Remove Item |
| Avail | | | Select Item | Remove Item |
| AvailSD | | | Select Item | Remove Item |
| NSphere | | | Select Item | Remove Item |
| NSphereL | | | Select Item | Remove Item |
| Agrotain | | | Select Item | Remove Item |
| AgroPlus | | | Select Item | Remove Item |
| Evap | | | Select Item | Remove Item |

If the Material Group is using any of the products from the *Specialty* tab, those items must be added to the corresponding *Key Products* tab. Likewise, if using the clay, temperature, etc. features on the *Technical* tab, the appropriate key products must be

selected. The key products must first be added to the form-U-net *Item Information* tab before they may be selected on the *Edit Material Group* window.

Products in Group

The *Products In Group* tab is a grid with products in the Material Group included in the left grid and products available to add in the right grid. Each product in the group has a minus (-) button that will remove it from the group. Each product available to add has a plus (+) button that will add it to the Material Group. If the item is not available to add in the right hand grid, an item card must be added for it in *Items Information*. The mixing order of the products in the left hand grid may be edited on the *Edit Selected Material Group / Edit Data* window. Left click, hold, and drag the item to rearrange the item rows.

Material Group MYBLEND: Edit MyGroup

General Technical Specialty Key Products **Products In Group**

Show:

All Products Fertilizers Chemicals Services Other Products

Products in Material Group:

| | |
|---|---|
| Item Code: I184600 | - |
| Mix Name: DAP (18-46-0) | |
| Description: DAP (18-46-0) | |
| Item Code: I115200 | - |
| Mix Name: MAP (11-52-0) | |
| Description: MAP (11-52-0) | |
| Item Code: I004600 | - |
| Mix Name: Triple (0-46-0) | |
| Description: Triple Superphosphate (0-46-0) | |
| Item Code: I460000 | - |
| Mix Name: UREA (46-0-0) | |
| Description: Urea (46-0-0) | |
| Item Code: I210000 | - |

Products Available to Add:

| | |
|---|---|
| Item Code: I103000 | + |
| Mix Name: 10-30-0 | |
| Description: Ammonium Phosphate Suspension | |
| Item Code: I103400 | + |
| Mix Name: 10-34-0 | |
| Description: Ammonium Polyphosphate 10-34-0 | |
| Item Code: I120000 | + |
| Mix Name: AmmThio12-00-265 | |
| Description: Ammonium Thiosulfate 12-0-0 | |
| Item Code: I200000 | + |
| Mix Name: Aqua Amm 20-0-0 | |
| Description: Aqua Ammonia (20-0-0) | |
| Item Code: I005400 | + |

Save Changes Reset View

Edit Data

To customize the Material Groups, go to the *Material Groups* tab, select the group to edit, and then select *Edit Data* from the *Edit Selected Material Group* dropdown menu. (The screen shown below appears.)

Material Group MYBLEND: Edit Full Data

| Mix Name: | Restriction Info: | | | | | Data Value: | | | | |
|-----------------|-------------------|-------|-------|-------|-------|-------------|-------|-------|---------|--|
| Mix Name | N | P | K | S | Mg | Zn | B | Ca | DEN | |
| DAP (18-46-0) | 18.00 | 46.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.7702 | |
| MAP (11-52-0) | 11.00 | 52.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 29.4100 | |
| Triple (0-46-0) | 0.00 | 46.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 19.00 | 30.7702 | |
| UREA (46-0-0) | 46.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 41.6700 | |
| AmmoSulf 21-0-0 | 21.00 | 0.00 | 0.00 | 24.00 | 0.00 | 0.00 | 0.00 | 0.00 | 36.3597 | |
| 0-0-60 | 0.00 | 0.00 | 60.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 31.7899 | |
| 0-0-50 | 0.00 | 0.00 | 50.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.7692 | |
| 0-0-22 | 0.00 | 0.00 | 22.00 | 22.00 | 11.00 | 0.00 | 0.00 | 0.00 | 20.8601 | |
| 36Zn 20S | 0.00 | 0.00 | 0.00 | 20.00 | 0.00 | 36.00 | 0.00 | 0.00 | 26.7301 | |
| 14.3% B | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.30 | 0.00 | 44.4395 | |
| Filler | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 22.7500 | |
| Product | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | |

Save Changes Reset Grid

The method to add or remove items from the Material Group is explained in the [“Products in Group”](#) on page 26.

The columns in the grid, called Restrictions, are usually nutrients, and the rows represent the possible raw ingredients. The name of each material is listed in the *Mix Name* column on the left. The code for each Restriction is listed at the top of each column.

To change a nutrient percentage for an item, double-click in the appropriate column on that item’s row. The editing cursor will appear. Enter the new number and press the **<Enter>** key or simply click in another cell in the table. After the change, notice there is a small triangle in the cell that has been changed. This remains visible until the window is saved, reset or closed.

Material Group MYBLEND: Edit Full Data

| Mix Name: | Restriction Info: | | | |
|-----------------|-------------------|-------|-------|-------|
| Mix Name | N | P | K | S |
| DAP (18-46-0) | 18.00 | 46.00 | 0.00 | 0.00 |
| MAP (11-52-0) | 11.00 | 52.00 | 0.00 | 0.00 |
| Triple (0-46-0) | 0.00 | 46.00 | 0.00 | 1.00 |
| UREA (46-0-0) | 46.00 | 0.00 | 0.00 | 0.00 |
| AmmoSulf 21-0-0 | 21.00 | 0.00 | 60.00 | 24.00 |
| 0-0-60 | 0.00 | 0.00 | 60.00 | 0.00 |

Below are rules that apply to this screen:

Moving a Row – to move a row, left-click and hold on the product and drag the row to its new location. The ingredients on the Mix Sheet appear in the order they are shown on the *Edit Data* table.

Product Row and Weight Balance Column – every Material Group contains a row named *Product* and a Weight Balance column called

Wt. Do not delete the *Product* row or *Wt* column. They are essential for the program to balance the weights of all the ingredients and the final blend. Do not adjust any information pertaining to the *Product* row or *Wt* column without consulting SSI Support.

Density Column – the *DEN*, or Density, column uses different units in dry and liquid groups. These are cu. ft/ton or gallons/ton, respectively.

Densities in Dry Material Groups – in a dry group, the numbers in the *DEN* column are in cubic feet per ton. To obtain this value, divide 2000 by the pounds per cubic feet of the product. For example, if an item has a density of 55 pounds per cubic foot, the density listed in the *Edit Data* table would be $2000/55 = 36.4$ cubic feet per ton. The conversion is also done automatically when an item is added using the *MyGroup Settings* feature.

Densities in Liquid Material Groups – in a liquid group, the numbers in the *DEN* column are in gallons per ton. To obtain this value from pounds per gallon, divide 2000 by the pounds per gallon of the product. For example, if ammonium thiosulfate has a density of 11.15 pounds per gallon, then the density listed in the *Edit Data* table would be $2000/11.15 = 179.4$ gallons per ton. The density conversion is done automatically by form-U-net and comes from the *Technical* tab in *Items Information*. The conversion is also done automatically when an item is added using the *MyGroup Settings* feature.

Densities of Dry Materials in Liquid Material Groups – the pounds per cubic foot listed for a dry fertilizer varies according to the particle or granule sizes in the material. The density, in pounds per cubic foot, is called the bulk density and takes into account the unoccupied space between the particles. When a dry fertilizer is dissolved into a liquid, the bulk density no longer applies.

Most dry fertilizers also list a *Specific Gravity* with the bulk density. Use the *Specific Gravity* to calculate a density for dry materials to be used in a liquid Material Group. The *Specific Gravity* is a ratio of the absolute density of the material to the density of liquid water, or 8.33 pounds per gallon. So, a material with a *Specific Gravity* of 1.2 weighs $(1.2)*(8.33) = 10.0$ pounds per gallon. To obtain the density in gallons per ton for a dry material in a liquid group, divide 240, which is the density of liquid water in gallons per ton, by the *Specific Gravity*. A material with a *Specific Gravity* of 1.2 would have a density of 200 gallons per ton.

Inserting a New Column – when a new column is created, a new Restriction is added to the group. To create a new column, right-click on a cell in the column next to where the new column is to be inserted, and select *Insert Custom Column*. The *Insert Custom Column* window displays. Enter a name for the restriction/custom column and set a *Type*. Be sure not to duplicate a restriction type / *Mix* checkbox setting in a particular Material Group unless the *Type* is *OtherRes*. The *Input Scale* should be set to '100' in nearly all cases.

Use *Edit Selected Material Group / MyGroup Settings* to add certain functionality or columns to the Material Group. If a Coated or Slow Release product is in the Material Group, open *Edit Selected Material Group / MyGroup Settings*, and select *Nitrogen Detail*. This creates new restrictions to use in formulations that allow a specific quantity of Slow Release or Coated nitrogen to be requested in a blend. If

functionality is needed that is not covered by the *MyGroup Settings* area, contact SSI.

Reset Grid – returns the Material Group to its most recent save. Any changes made to the group since the last save will be lost.

Add Nutrient From Column – places an option on the *Formulation* tab to allow nutrients to be requested from a specified item.

Example – suppose Potassium Sulfate and Potassium Chloride are handled by the business. Even though Potassium Chloride is cheaper, the grower wants the Potash to come from Potassium Sulfate. Select the cell that represents the column of the nutrient and the row of the item from which to supply the nutrient. In this example, click on the ‘50’ in the K column of the *Potassium Sulfate* row. Right-click that same cell, and select *Nutrient From*. This adds the column. Click the **Save Changes** button. The *Formulation* tab will refer to it as *K from 0-0-50*.

| Material Group MYBLEND: Edit Full Data | | | | | | |
|--|-------------------|-------|-------|-------|------|------|
| Mix Name: | Restriction Info: | | | | | |
| Mix Name | N | P | K | S | Mg | Zn |
| DAP (18-46-0) | 18.00 | 46.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| MAP (11-52-0) | 11.00 | 52.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Triple (0-46-0) | 0.00 | 46.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| UREA (46-0-0) | 46.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| AmmoSulf 21-0-0 | 21.00 | 0.00 | 0.00 | 24.00 | 0.00 | 0.00 |
| 0-0-60 | 0.00 | 0.00 | 60.00 | 0.00 | 0.00 | 0.00 |
| 0-0-50 | 0.00 | 0.00 | 50.00 | 0.00 | 0.00 | 0.00 |
| 0-0-22 | 0.00 | 0.00 | 2 | | | |
| 36Zn 20S | 0.00 | 0.00 | | | | |
| 14.3% B | 0.00 | 0.00 | | | | |
| Filler | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Product | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

This adds a new Restriction called *01_RES*. Note this restriction also shows ‘50’ in the *Potassium Sulfate* row.

| Material Group MYBLEND: Edit Full Data | | | | |
|--|-------------------|-------|-------|--------|
| Mix Name: | Restriction Info: | | | |
| Mix Name | N | P | K | 01_RES |
| DAP (18-46-0) | 18.00 | 46.00 | 0.00 | 0.00 |
| MAP (11-52-0) | 11.00 | 52.00 | 0.00 | 0.00 |
| Triple (0-46-0) | 0.00 | 46.00 | 0.00 | 0.00 |
| UREA (46-0-0) | 46.00 | 0.00 | 0.00 | 0.00 |
| AmmoSulf 21-0-0 | 21.00 | 0.00 | 0.00 | 0.00 |
| 0-0-60 | 0.00 | 0.00 | 60.00 | 0.00 |
| 0-0-50 | 0.00 | 0.00 | 50.00 | 50.00 |

In the *Formulation* grid (shown below), notice *K from 1000050*. Now, a request may be made for a specific quantity of Potash from

0-0-50. That quantity of *K from 1000050* will be added regardless of how much total *Potash* was requested in the formulation.

| Formulation Request | | | Per Acre | Analysis |
|---------------------|---|---------------------------------|----------|----------|
| Nitrogen | > | <input type="text" value="--"/> | Lb. | 0.00 |
| Phosphate | > | <input type="text" value="--"/> | Lb. | 0.00 |
| Potash | > | <input type="text" value="--"/> | Lb. | 0.00 |
| K from 1000050 | > | <input type="text" value="--"/> | Lb. | 0.00 |
| Sulfur | > | <input type="text" value="--"/> | Lb. | 0.00 |
| Magnesium | > | <input type="text" value="--"/> | Lb. | 0.00 |
| Zinc | > | <input type="text" value="--"/> | Lb. | 0.00 |
| Boron | > | <input type="text" value="--"/> | Lb. | 0.00 |
| Calcium | > | <input type="text" value="--"/> | Lb. | 0.00 |

Edit Activities

This window lists information about each product in the Material Group such as name, code, cost, price, and units. The rows on the *Edit Activities* screen are the same as the rows on the *Edit Data* screen.

Material Group Selection:

MYBLEND

Material Groups Setup Edit Selected Material Group

Material Group MYBLEND: Edit Activities

| Activity Name: | | | Activity Info: | | | | | | | | | |
|-----------------|---------|--------------|----------------|-------------|-------------|-------------|-------|-------|--------------------------|--------------------------|-------------------------------------|--|
| Mix Name | Code | Cost | Price | Lower Bound | Upper Bound | Input Scale | Units | Type | Prompt Low | Prompt Up | Mix | |
| DAP (18-46-0) | I184600 | \$450.0000 | \$560.0000 | 0.000 | Inf | 2000.0000 | Ton | FERT | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| MAP (11-52-0) | I115200 | \$500.0000 | \$625.0000 | 0.000 | Inf | 2000.0000 | Ton | FERT | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Triple (0-46-0) | I004600 | \$600.0000 | \$700.0000 | 0.000 | Inf | 2000.0000 | Ton | FERT | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| UREA (46-0-0) | I460000 | \$350.0000 | \$440.0000 | 0.000 | Inf | 2000.0000 | Ton | FERT | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| AmmoSulf 21-0-0 | I210000 | \$350.0000 | \$420.0000 | 0.000 | Inf | 2000.0000 | Ton | FERT | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 0-0-60 | I000060 | \$500.0000 | \$625.0000 | 0.000 | Inf | 2000.0000 | Ton | FERT | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 0-0-22 | I000022 | \$800.0000 | \$1,000.0000 | 0.000 | Inf | 2000.0000 | Ton | FERT | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 36Zn 20S | I20S36Z | \$1,300.0000 | \$1,500.0000 | 0.000 | Inf | 2000.0000 | Ton | FERT | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 14.3% B | I14B000 | \$800.0000 | \$1,000.0000 | 0.000 | Inf | 2000.0000 | Ton | FERT | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Filler | I000000 | \$30.0000 | \$38.0000 | 0.000 | Inf | 2000.0000 | Ton | FERT | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Product | PRODUCT | \$0.0000 | \$0.0000 | 0.000 | Inf | 1.0000 | Po... | PR... | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

Mix Name – the name that appears on the Mix Sheet. It should be a name the plant operators will easily recognize. If a different Mix Name for an item is preferred, navigate to the *Item Information* window and edit the item. Replace the existing name with the preferred name of the item. Select the **Update** button to save the changes.

Code – a unique set of characters form-U-net uses to identify each material. The code must be eight characters or less. It must not be changed if any orders containing that item have been created with this Material Group and held or shipped.

The Item Code must be:

- Alpha-numeric (any combination of letters, except ‘X’ or ‘Z’, and/or numbers. No blanks or special characters, such as %, #, -, etc.)
- Unique
- A maximum of 8 characters
- Not beginning with letters ‘X’ or ‘Z’.

Cost – the supplier’s price for each invoice unit of the item. This is used for Least Cost Formulation.

Price – the price per invoice unit of the material sold to the customer.

Lower Bound – bounds tell the computer how many units per acre (units per ton in *Analysis* mode) of the material that may or may not be used to satisfy requirements of a formula. Because it is physically impossible to mix a negative amount of a material the *Lower Bound* is usually set to ‘0’. This indicates that any amount above ‘0’ and less than the *Upper Bound* may be used. The lower bounds are typically prompted when herbicides and mineral mixes are involved or when a separate application material such as ammonia or starter is ordered.

Upper Bound – the *Upper Bound* indicates the maximum number of units allowable per acre. When working in *Analysis* or *Grade* mode, this number represents the maximum amount of material per ton of mixed fertilizer. Ordinarily this is set to *Inf*, meaning there are no restrictions on the material’s use. To change the *Upper Bound*, click in the box to highlight it. Type in the number for the maximum number of units allowable per acre. If both bounds are set to ‘0’, form-U-net will deny use of the material. For chemicals, the recommended maximum units per acre are entered and form-U-net will limit the use rate to the specified ranges.

Input Scale – the number of pounds per *Request Unit*. It is particularly useful for volumetric mixing when such units of measure as gallons, quarts, or pints are used.

Units – the cost and price of the product must correspond to the unit listed in this column. The *Units* are retrieved from the *Request Unit* in *Item Information* and are the units in which the material is mixed.

Type – used throughout form-U-net and often controls what does and does not happen with each *Type*. Double-click in the *Type* column to select the type from the drop down list that appears.

Types:

- **FERT** – Fertilizer (Only fertilizers to be mixed are used in margin calculations)
- **CHEM** – Chemical (Herbicides, Insecticides, etc.)
- **SEED** – Seed (Seed or Item *Type Other*)

- **HCAP** – Heat Capacity (BTUs required to raise product temperature 1° F.)
- **HREA** – Heat of Reaction (BTUs generated by chemical reactions)
- **HSOL** – Heat of Solution (BTUs generated by dissolving ingredients)
- **PROD** – Product (Output from the mixer, exactly one required)
- **OTHR** – Other (Not normally used, use seed instead)

Prompt Lo – tells form-U-net to prompt for a material's *Minimum Rate* on the *Formulation* tab. The program will expect minimum units per acre in *Acre* mode or minimum units per ton in *Analysis* mode. A lower prompt for a material shows on the *Formulation* tab as a '>' and a '0.00' in the *Acre* or % column.

Prompt Up – tells form-U-net to prompt for a material's *Maximum Rate* on the *Formulation* tab. The program will expect maximum units per acre in *Acre* mode or maximum units per ton in *Analysis* mode. An upper prompt for a material shows on the *Formulation* tab as a '<' and a '++' in the *Acre* or % column. The '++' signifies infinity. On the *Formulation* tab, the *Prompt Up* reads 'This item's quantity is to be less than infinity.' When running a formula, if the '++' is changed to '0' for this item, the equation then uses a quantity less than 0, which blocks the use of this item in the formula. When left as '++' for a formula, the item is used if it fits the Least Cost criteria.

Mix – controls whether the material is to be included in the mixer. If this option is unchecked, the material may be requested and calculated on a quantity per acre or quantity per ton basis, but it will not be included in the analysis of the mixed fertilizer. It should always be checked for fertilizers, chemicals, or seed that are to be blended in the mix.

Edit Restrictions

In general, Restrictions are a list of minimum guarantees. The window displays a grid listing all available Restrictions along with their constituent data. To make changes, select the appropriate column, and edit the information as described in the following sections.

If no calculation is present on the *Formulation* window and changes are made to the *Edit Restrictions* window, a prompt displays to save when the screen is exited. While a calculation is on the screen, the changes made are temporary and will be erased the next time the group is reloaded. The blend is recalculated with the modified restrictions when the screen is closed.

Restriction Name – the name that displays on the *Formulation* screen if the Restriction is prompted, which happens if *Prompt Lo* or *Prompt Up* is selected.

Code – used as the column header on the *Edit Full Data* window. It is the abbreviation for the Restriction name.

Min – the minimum requirement for that Restriction. Every calculation will satisfy this requirement. For example, if creating suspension blends with a minimum of 2% clay in every blend, a value of 2.0 would be placed in the *Min* column for the clay Restriction. Every calculation

delivers a mix with 2% clay, even if clay was not requested on the *Formulation* window. In *Edit Data*, -2.0 (negative 2.0) is listed in the *Product* row of the *Clay* column. If the Restriction *Min* is set manually, the *Lower Bound* of that Restriction must be set to zero.

Price – each Restriction may be given a *Price*. This is normally done only when choosing to price materials by unit of nutrient. In this case, all the prices in the *Activities* screen are set to zero, so the program only prices each material by its nutrient percentage.

Lower Bound – defaults to *-Inf*. It is described as the guarantee and is changed each time a formula is calculated. For example, when 100 pounds of N per acre is requested, the *Lower Bound* is set to *100*. Set *Lower Bound* to *-Inf* by typing ‘-Inf’ in the textbox.

Upper Bound – the maximum amount of each Restriction that may be applied. This value defaults to *Inf*, or infinity, which tells form-U-net it may use as much of that restriction as necessary, within the limits of Least Cost or user specifications. When entering a number for the maximum chlorine Restriction on the *Formulation* tab, that number is entered in the *Upper Bound* for *Chlorine*.

Input Scale – used to convert the values in *Edit Full Data* to their decimal representation. The numbers are usually entered in the grid as a percent. Therefore, this input scale is usually *100*. If the nutrient value cannot be represented as a tenth of a percent, this input scale may be changed to another number such as *1,000* or *10,000*. In the case of heavy metals entered in parts per million, the *Input Scale* is set to *1,000,000*.

Unit – dictates the unit that appears on the *Formulation* tab if the *Prompt Lo* or *Prompt Up* is selected.

Type – distinguishes each Restriction and must be selected from the list using the drop down arrow. It is very important that the combination of Restriction *Type* and *Mix* is not duplicated. For example, if there are two Restrictions with the *Type N* and both have the *Mix* option selected, erroneous formulations will be generated. In these cases, it is usually best to change one of those Restriction *Types* to *Othr*. The *Type Othr* may be used on multiple restrictions.

| | Type | Description |
|-----|-------------|-----------------------------------|
| 1. | N | Nitrogen (general or total) |
| 2. | P | Phosphorous (available Phosphate) |
| 3. | K | Potassium (Potash) |
| 4. | Ca | Calcium |
| 5. | Mg | Magnesium |
| 6. | S | Sulfur (total) |
| 7. | B | Boron |
| 8. | Co | Cobalt |
| 9. | Cu | Copper |
| 10. | Fe | Iron |
| 11. | Mn | Manganese |

| | | |
|-----|------|--------------------------------|
| 12. | Mo | Molybdenum |
| 13. | Zn | Zinc |
| 14. | Cl | Chlorine |
| 15. | Am-N | Ammoniacal Nitrogen |
| 16. | Ni-N | Nitrate Nitrogen |
| 17. | Ur-N | Urea Nitrogen |
| 18. | Wi-N | Water-Insoluble Nitrogen |
| 19. | Coat | Coated (Slow Release) Nitrogen |
| 20. | Salt | Salt Index |
| 21. | Clay | Clay |
| 22. | Watr | Water |
| 23. | Den | Density |
| 24. | WsMg | Water-Soluble Magnesium |
| 25. | WsMn | Water-Soluble Manganese |
| 26. | WsS | Free Sulfur |
| 27. | Wt | Weight Balance |
| 28. | WsCa | Water-Soluble Calcium |
| 29. | WsB | Water-Soluble Boron |
| 30. | WsCo | Water-Soluble Cobalt |
| 31. | WsCu | Water-Soluble Copper |
| 32. | WsFe | Water-Soluble Iron |
| 33. | WsMo | Water-Soluble Molybdenum |
| 34. | WsZn | Water-Soluble Zinc |
| 35. | Othr | Other (generic category) |
| 36. | As | Arsenic |
| 37. | Cd | Cadmium |
| 38. | Hg | Mercury |
| 39. | Ni | Nickel |
| 40. | Pb | Lead |
| 41. | Se | Selenium |

Prompt Lo – the minimum amount of a nutrient. If this option is selected, form-U-net puts the Restriction on the *Formulation* tab with a greater than (>) sign.

Prompt Up – the maximum amount of a nutrient. If this option is selected, form-U-net puts the Restriction on the *Formulation* tab with a less than (<) sign. An upper prompt is typically used with chlorine or heavy metals. This allows the user to request a formulation using materials that will give 5 lb or less chlorine per acre, for example.

Mix – indicates whether form-U-net considers the nutrient on an individual basis. This should always be selected except for categories that are a subset of another Restriction, such as slowly available water-soluble nitrogen.

Edit Information

The *Edit Information* window lists various information about the Material Group.

Note: Do not change these defaults if the desired results are not clear.

Product Weight Unit – indicates whether the units are English or metric. Pounds is the default Product Weight Unit.

Product Unit of Measure – the unit of measure to be used to invoice the mixed product. The default is Ton.

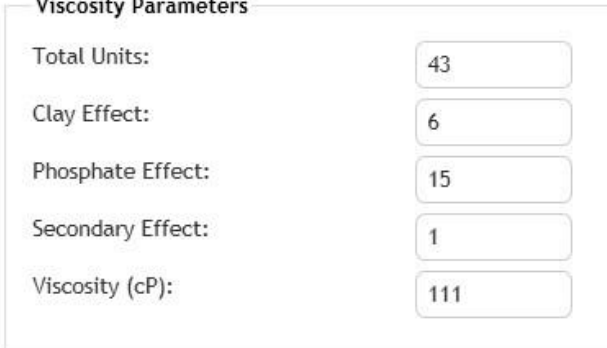
In western Canada, the official system of weights and measurements is metric, but the land survey is an extension of the western United States. Farmers order fertilizer in pounds per acre of nutrients (N, P, K), but invoice the mixed product in \$/mTon. In this case, set *Product Weight Unit* to *Pounds* and *Product Unit of Measure* to *Ton*. Set the *Mixer Unit* to *Kilogram*. In *Item Information*, set the products' units to metric units.

If selling mixed fertilizer in bags and pricing them as *\$/Bag*, set the *Product Unit of Measure* option to *Bag* and fill in the bag size (default is 50 Lbs). This bag size is saved with the Material Group. A Material Group for each bag size is needed.

Material System – indicates the kind of blend being produced. There are nine options including *Dry Mixing*, *Suspension*, *Sol. No Poly UAN*, *Sol. 55% Poly UAN*, *Sol. No Poly Urea*, *Sol. 55% Poly Urea*, *Sol. 70% Poly UAN*, and *Fluid Mixing*. Click the drop down box to change options.

Dry Mixing – materials in *Dry Mixing* groups have densities of cubic feet per ton on the *Edit Full Data* window. The final blend density is shown on the *Formulation* screen in pounds per cubic feet.

Suspension – materials in *Suspension* groups have densities of gallons per ton on the *Edit Data* screen. The final blend density is shown on the *Formulation* screen in pounds per gallon. The application rate is shown in the *Formulation Results* grid in both pounds and gallons per acre. If selecting the *Suspension* option, a *Viscosity Parameters* area displays below the *Material System* box (as seen in the image below).



| Viscosity Parameters | |
|----------------------|-----|
| Total Units: | 43 |
| Clay Effect: | 6 |
| Phosphate Effect: | 15 |
| Secondary Effect: | 1 |
| Viscosity (cP): | 111 |

The *Viscosity Parameters* prevent the solution from becoming too thick or too thin. They are based on the Tennessee Valley Authority (TVA) Total Nutrient Rule Of Thumb:

$$Y = T - C*(\% \text{ clay}) + P*Rp$$

Where T = total units, C = clay effect, P = phosphate effect, Rp = (%P2O5) / (%N + %P2O5 + %K2O), and Y = %N + %P2O5 + %K2O + F*(S + M), with F = secondary effect, S = sum of all secondary percentages, and M = sum of all micronutrient percentages. The default values for the variables are:

$$T = 43.00, C = 6.00, P = 15.00, F = 1.50.$$

The default values should deliver an ideal *Viscosity*, but if the solution is too thick, the *Total Units* may be reduced. Do not change any of the 'effect' variables. If the solution is too thin, the *Total Units* may be increased.

In calculations per acre, form-U-net uses the TVA Total Nutrient Rule Of Thumb to automatically calculate the grade of the blend. In *Grade* mode, no adjustment is made. The *Viscosity* of the blend is not listed on the *Formulation* screen, but the nozzle calculations, if requested, may change according to the predicted *Viscosity*.

Solution No Poly UAN – this *Material System* is for liquid groups and incorporates TVA salt-out models. Materials in liquid groups have densities of gallons per ton on the *Edit Data* screen. The final blend density is shown on the *Formulation* screen in pounds per gallon. The *Application Rate* is shown in the *Formulation Results* grid in both pounds and gallons per acre.

When one of the *Solution* or *Fluid Mixing Material Systems* is selected from the drop down list, the *Solution Information* section will be available to use (as shown below).

Solution Information

Control Total Water

Salt-Out Temperature (Deg. F):

If *Control Total Water* is selected, the amount of total water needed for the chosen ratio of N: P: K is calculated for the desired minimum salt temperature selected. This amount of total water is based upon using pure phosphoric acid. This minimum total water is then put in the *Water Balance*, on the *Edit Activities* window. It is important to supply the correct total water numbers for the items because they will be less than the pure materials from which the original salt out data was measured. For example, UAN 32% is 20% water. If form-U-net has been used for the salt out data previous to selecting *Control Total Water*, lower grades will now be recommended, depending on the purity of the phosphate materials.

The *Salt Out Temperature* is the desired salt-out temperature for the mix. This only applies in calculations per acre, in which form-U-net will use the TVA salt out model to automatically calculate

the grade of the blend. The program will increase or decrease the grade as needed to create a blend that salts out at the desired *Salt Out Temperature*. In grade calculations, form-U-net will report the predicted *Salt Out Temperature* for the requested grade. The plant report displays the *Salt Out Temperature* when it is between a range of -20°F and 160°F. The *Salt Out Temperature* is absent when it is outside that temperature range.

Solution 55% Poly UAN – this *Material System* is for liquid groups and incorporates TVA salt-out models using UAN solution and normal agricultural ammonium polyphosphate. Materials in liquid groups have densities of gallons per ton on the *Edit Data* screen. The final blend density is shown on the *Formulation* screen in pounds per gallon. The *Application Rate* will be shown in the *Formulation Results* grid of the *Formulation* screen in both pounds and gallons per acre.

Solution No Poly Urea – this *Material System* is for liquid groups and incorporates TVA salt-out models using urea and no ammonium polyphosphate. Materials in liquid groups have densities of gallons per ton on the *Edit Data* screen. The final blend density will be shown on the *Formulation* screen in pounds per gallon. The *Application Rate* is shown on the *Formulation Results* grid of the *Formulation* screen in both pounds and gallons per acre.

Solution 55% Poly Urea – this system is for liquid groups and incorporates TVA salt-out models using urea and normal agricultural ammonium polyphosphate. Materials in liquid groups have densities of gallons per ton on the *Edit Data* screen. The final blend density will be shown in the *Formulation Results* grid of the *Formulation* screen in pounds per gallon. The *Application Rate* is shown in the *Formulation Results* grid of the *Formulation* screen in both pounds and gallons per acre.

Solution 70% Poly UAN – this system is for liquid groups and incorporates TVA salt-out models using UAN solution and highest quality or food grade ammonium polyphosphate. Materials in liquid groups have densities of gallons per ton on the *Edit Data* screen. The final blend density is shown in the *Formulation Results* grid of the *Formulation* screen in pounds per gallon. The application rate is shown in the *Formulation Results* grid of the *Formulation* screen in both pounds and gallons per acre.

Fluid Mixing – this *Material System* is for liquid groups and primarily used when blends are requested with secondary and/or minor nutrients. Materials in liquid groups have densities of gallons per ton on the *Edit Data* screen. The final blend density is shown in the *Formulation Results* grid of the *Formulation* screen in pounds per gallon. The *Application Rate* is shown in the *Formulation Results* grid of the *Formulation* screen in both pounds and gallons per acre.

If the *Control Total Water* box is left unchecked, form-U-net will not add any additional water in *Per Acre* mode and will not return a *Salt Out Temperature* in either grade or acre calculations. If the *Control Total Water* box is selected, the *Salt Out Temperature* box is activated and becomes editable. This number is the desired salt out temperature. In *Acre* mode, enough water is automatically

added to the mix to cause it to salt out at or below the value entered in this data field, as with the TVA salt out models.

If *Control Total Water* is selected, a *Salt Out Temperature* is estimated based on the data supplied on the *Edit Data* window. The estimates are for the amounts of total water needed at 32°F and 77°F for the specified ratio of N:P:K.

Mixer Unit – the default value for *Mixer Unit* is *Pound*. Plants with liquid volumetric mixers may want to use *Gallon* as the *Mixer Unit*. The weight of individual ingredients on the Plant Report sheet is also listed in pounds.

Mixing Charge – an optional charge that is applied in addition to, or instead of, the *Spreading Charges*. It is always determined by the ton. The option to change the description to *Bagging*, *Delivery*, or *Spreader* is available using the *Description* drop down menu. The *Mixing Charge* is always shown in the *Formulation Results* grid of the *Formulation* screen. This charge is not carried to the Blend Ticket.

Spreading Charge – an optional fee for application of the fertilizer. It may be charged to customers per acre, per ton, or per batch. This charge displays in the *Formulation Results* grid of the *Formulation* screen and on the Quote Sheet, but it does not display on the Mix Sheet or File Sheet.

Volumetric Mixing – should be selected only if utilizing a volumetric mixing system. In a dry Material Group, the *Maximum Batch Size* is listed in *Cubic Feet* instead of *Pounds*.

In a liquid Material Group, the *Maximum Batch Size* is listed in *Gallons*. These units will only be visible on the *Edit Information* screen because the units are not listed with the batch size on the *Formulation* screen.

Maximum Batch Size – indicates the maximum weight or volume of each batch of mixed fertilizer. This value usually represents the size of the mixer, but it could also be the maximum capacity of the application or delivery vehicles. The *Maximum Batch Size* is always listed in pounds unless the *Volumetric Mixing* option is selected. The default batch size comes from the *Edit Selected Material Group / Edit Information* window. This may be overridden on the *Formulation* window on a request by request basis.

Accumulate Scales – determines whether form-U-net will accumulate the scale reading on the Mixing Sheet. The default setting is *True*. If the scales are not accumulated, each scale reading will match the weight of that ingredient in the mix.

Scale Division – determines how closely to round the accumulated scale reading on the Mixing Sheet. It represents the accuracy of the scale. The *Scale Division* of most scales is ten pounds or less, even when weighing loads up to 55,000 pounds.

Nozzle Tip Calculations – applies only to suspension or clear liquid Material Groups.

Average Speed – the speed of the applicator vehicle in miles per hour.

Nozzle spacing – the width between each nozzle measured in inches.

Minimum and Maximum Pressure – the recommended ranges of pressures to give uniform spray patterns. The default values are 10 psi and 40 psi, respectively.

Nozzle Type – there are three possible *Nozzle Types* in this model, *Flood Jet -- 10*, *Flood -- Jet 20*, and *Rain drop -- 40*. Other *Nozzle Types* may be calculated if needed. After these values are selected, form-U-net uses the pounds per acre, shown in the *Formulation Results* grid of the *Formulation* screen, and the selected values for the nozzles, to calculate the pressure at the nozzle tip. If the pressure is above 40 psi or below 10 psi, the spray pattern may not be uniform.

Nozzle Information Setup

Liquid fertilizers and agricultural chemicals are often applied by spraying. A truck, applicator or tractor moves through the field at a speed of V miles per hour with a tank pressurized at P pounds per square inch. On the rear of the applicator are nozzles mounted on a boom separated by S inches. The number of gallons per minute G that are sprayed from a given nozzle are controlled by this pressure. The physical relationship is given by the equation:

$$G = a P^{1/2}$$

The variable a is a constant dependent on the size of the nozzle. For example, the FloodJet Nozzle SS80 sprays 10 gallons per minute at 8 PSIG (pounds per square inch gauge). Therefore,

$$a = 8/10^{1/2}$$

or

$$G = 2.53 P^{1/2} \text{ (for SS80)}$$

As a result, 40 PSIG will provide 16 gallons per minute of spray. The number 10 above is a special number called the *Nozzle Type (Type)*. To find this number take a *Tip* name, such as SS210, and divide the number part (210) by 10. In the *Nozzle* table, under the *GPM Capacity* column, find 12 GPM. 10 PSI will be on this row. By using this rule, every nozzle size in the table should have the same value, $Type = 10$. Notice *Rain drop* nozzles are a $Type = 40$. In general,

$$a = (Tip/10)/Type^{1/2}$$

or

$$G = [(Tip/10)/Type^{1/2}] P^{1/2}$$

This may also be expressed as

$$P = (10 G/Tip)^2 Type$$

Some applicators may want to spread R pounds per acre of liquid that weighs D pounds per gallon. The applicator will be moving at a ground speed of $88 V$ (feet per minute) and one nozzle will cover $2/12$ feet as it moves, or $7.333 V S$. One acre contains 43,560 square feet, so the applicator is covering $V S/5940$ acres per minute at (R/D) gallons per acre which gives

$$G = (R V S)/(D 5940) \text{ gallons per minute,}$$

or

$$P = [(R V S)/(594 D Tip)]^2 Type \text{ (PSIG)}$$

The values in the *Nozzle Information Setup* area are based on water, which weighs 8.337 pounds per gallon; therefore, pressure must be adjusted as

$$P = [(R \ V \ S) / (594 \ D \ Tip)]^2 \text{ Type } (D / 8.337) \text{ (PSIG)}$$

In the case of suspension fertilizers, liquids with a greater viscosity than water are being forced through the same opening. In order to maintain the same flow rate, more pressure is required.

Item Information

Overview

The physical and chemical characteristics of the items used in creating blends is stored here. Complete and accurate data is critical to good formulation results.

Item Information:

+ Add New Item ✓ Save Grid Sort

| Item Code | Item Mix Name | Item Description | |
|-----------|------------------|-----------------------------|--|
| I20536Z | 36Zn 20S | Zinc Sulfate (36% Zn) | |
| AGROPLUS | AgroPlus | Agrotain Plus | |
| AGROTAIN | Agrotain | Agrotain | |
| I210000 | AmmoSulf 21-0-0 | Ammonium Sulfate (21-0-0) | |
| I120000 | AmmThio12-00-26S | Ammonium Thiosulfate 12-0-0 | |
| I200000 | Aqua Amm 20-0-0 | Aqua Ammonia (20-0-0) | |
| AVAIL | Avail | Avail | |
| AVAILSD | Avail SD | Avail Sd | |
| ICLAY | CLAY | Clay | |
| I184600 | DAP (18-46-0) | DAP (18-46-0) | |

Navigation: 1 2 3 4 10 items per page 11 - 20 of 34 items

The navigation bar in the lower left corner is used to browse the pages of items that have been set up. To search for items, click the *Filter* icon to the right of each column header. (An example of a search for DAP is shown below.)

Item Information:

+ Add New Item ✓ Save Grid Sort

| Item Code | Item Mix Name | Item Description | |
|-----------|------------------|-----------------------------|--|
| I20536Z | 36Zn 20S | Show items with value that: | |
| AGROPLUS | AgroPlus | Contains | |
| AGROTAIN | Agrotain | DAP | |
| I210000 | AmmoSulf 21-0-0 | And | |
| I120000 | AmmThio12-00-26S | Is equal to | |
| I200000 | Aqua Amm 20-0-0 | | |
| AVAIL | Avail | | |
| AVAILSD | Avail SD | Avail Sd | |

Filter: Filter Clear

Notice there are filter options in three drop down boxes for use in more refined searches. When the parameters have been set for the filter, click the **Filter** button. The list displays the results. To reset the filter, click the previously selected *Filter* icon, and then click the **Clear** button. Do this for each column that was filtered to return the list to the default state. Exiting *Item Information* and then returning also resets the filters to the default state.

Edit Items

Information for each item is stored on the Item Card.

Item Code – a 10-character string used to identify the product. This must be unique to each item.

Mix Name – a shortened description of the product not exceeding 16 characters. This will display on printouts and the *Formulation* window in form-U-net.

Description – enter a description to help distinguish items in form-U-net.

Is Active – select this checkbox to mark the item as active. If not selected, the item will be considered inactive. If the item is currently being used in a Material Group, the item may not be marked inactive.

Account Number – should not be used unless directed by an SSI staff member.

General Info

The general item information, such as units, cost, and prices are stored here.

Item Code*

Mix Name*

Description

Is Active

Account Number

General Info
Grade Info
Technical Info
Advance API Info

| | | | |
|--------------|---|-----------|---------------------------------------|
| Item Type | <input type="text" value="Fertilizer"/> | Item Cost | <input type="text" value="\$450.00"/> |
| Request Unit | <input type="text" value="Ton"/> | Price 1 | <input type="text" value="\$560.00"/> |
| Invoice Unit | <input type="text" value="Ton"/> | Price 2 | <input type="text" value="\$560.00"/> |
| Mixing Unit | <input type="text" value="Pound"/> | Price 3 | <input type="text" value="\$560.00"/> |
| | | Price 4 | <input type="text" value="\$560.00"/> |
| | | Price 5 | <input type="text" value="\$560.00"/> |

Item Type – items must be declared as Fertilizer, Chemical, Service or Other.

Request Unit – the unit of measurement to be used in the Material System. It corresponds to the Units column in Edit Activities.

Invoice Unit – the unit to be used to calculate the selling price of the item displayed in form-U-net. This corresponds to the Purchase Unit in Edit Activities.

Mixing Unit – used for mixing in the Material System. For Fertilizer items, the most common setting is Pound.

Item Cost – the cost per Invoice Unit. It is used in the Material System from which the Least Cost Formulation calculations are made with form-U-net.

Grade Info

This tab contains the percent concentration of the 13 recognized nutrients beneficial to plant growth. Expanding the *Nitrogen Detail*, *Secondary Nutrients*, *Minor Nutrients*, and *Non-Nutrient Metals* areas allows the ability to enter additional information on the item. *WS* stands for Water Soluble and *Che* means Chelated. Consult the item's label, Safety Data Sheet, or manufacturer for these values. Fields displayed in red font are parts per million (ppm).

Primary Nutrients – these are the nutrients that make up many of the items in form-U-net, consisting of Nitrogen, Phosphorous, and Potassium.

Other Grade Info – in this section, at the top right, enter the *Chlorine* percentage and the *Salt Index* of the material. The Salt Index is the current item's tendency to increase osmotic pressure.

Nitrogen Detail – enter the quantity of nitrogen supplied in the *Ammon*, *Nitrate*, *Urea*, *OtherN*, *WIN* (Water Insoluble Nitrogen), *CoatedN*, and *SlowN* (Slow Release) textboxes. Urea is 46% urea form nitrogen, so *46.00* should be entered under *Urea*. The total nitrogen of the item must equal the total of the *Ammon*, *Nitrate*, *Urea*, and *WIN* values. The categories of *OtherN*, *CoatedN*, and *SlowN* will be the portion of the total nitrogen from these categories. For example, there may be an item that is 39% nitrogen in the *Urea* form and the percentage of that nitrogen that is coated may be 35%. The Coated portion of the nitrogen should not also be specified as Slow in this breakdown.

- **Ammon** is the Ammoniacal Nitrogen.
- **Nitrate** is the Nitrate form of nitrogen.
- **Urea** is the Urea form of nitrogen.
- **OtherN** is a special category for nitrogen forms that don't fit the strict definition of the other nitrogen categories.
- **WIN** is Water Insoluble Nitrogen.
- **CoatedN** is Coated Nitrogen that is used for more controlled release, typically using sulfur or polymers.
- **Slow N** is the nitrogen fraction that releases to the plants over time.

Secondary Nutrients – enter *Total Calcium, Total Magnesium,* and *Total Sulfur* all in elemental form. *WS* stands for Water Soluble. Check the item’s label for this value.

Minor Nutrients – enter *Total Boron, Total Cobalt, Total Copper, Total Iron, Total Manganese, Total Molybdenum,* and *Total Zinc* in elemental form here. *Chel* stands for Chelated. If the item’s label indicates the percentage or degree of water solubility, that value may be entered in the *WS* field.

Non Nutrient Metals – the *Non-Nutrient Metals* fields, otherwise known as the Heavy Metals, are set for units of ppm, which is indicated by the red font color. If the concentration is 900 ppm, for example, enter *900* for that metal. If there are fertilizer items with significant content of heavy metals, this feature helps manage their use within regulated guidelines.

Edit

| | | | |
|-------------|--|----------------|-------------------------------------|
| Item Code* | <input type="text" value="I184600"/> | Is Active | <input checked="" type="checkbox"/> |
| Mix Name* | <input type="text" value="DAP (18-46-0)"/> | Account Number | <input type="text"/> |
| Description | <input type="text" value="DAP (18-46-0)"/> | | |

| | | | |
|--------------|------------|----------------|------------------|
| General Info | Grade Info | Technical Info | Advance API Info |
|--------------|------------|----------------|------------------|

| | | | | | | | | | | | | | | |
|---|------------------------------------|----------------------------------|---|---|---|-----------------------------------|-----------------------------------|----------------------------------|--|--|----------|------------|-----------------------------------|------------------------------------|
| <div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Primary Nutrients</div> <table style="width: 100%; text-align: center;"> <tr> <td style="width: 33%;">N</td> <td style="width: 33%;">P</td> <td style="width: 33%;">K</td> </tr> <tr> <td><input type="text" value="18.0"/></td> <td><input type="text" value="46.0"/></td> <td><input type="text" value="0.0"/></td> </tr> </table> | | | N | P | K | <input type="text" value="18.0"/> | <input type="text" value="46.0"/> | <input type="text" value="0.0"/> | <div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Other Grade Info</div> <table style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">Chlorine</td> <td style="width: 50%;">Salt Index</td> </tr> <tr> <td><input type="text" value="0.00"/></td> <td><input type="text" value="29.00"/></td> </tr> </table> | | Chlorine | Salt Index | <input type="text" value="0.00"/> | <input type="text" value="29.00"/> |
| N | P | K | | | | | | | | | | | | |
| <input type="text" value="18.0"/> | <input type="text" value="46.0"/> | <input type="text" value="0.0"/> | | | | | | | | | | | | |
| Chlorine | Salt Index | | | | | | | | | | | | | |
| <input type="text" value="0.00"/> | <input type="text" value="29.00"/> | | | | | | | | | | | | | |

| | | | | | | |
|------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Nitrogen Detail | | | | | | |
| Ammon | Nitrate | Urea | OtherN | WIN | CoatedN | SlowN |
| <input type="text" value="18.00"/> | <input type="text" value="0.00"/> | <input type="text" value="0.00"/> | <input type="text" value="0.00"/> | <input type="text" value="0.00"/> | <input type="text" value="0.00"/> | <input type="text" value="0.00"/> |

| Secondary Nutrients ▲ | | Minor Nutrients ▲ | | | |
|--|----------------------|---|---------------------|---|-----------------------|
| <p>Calcium</p> <p>Total Calcium 0.00</p> <p>WS Calcium 0.00</p> | | <p>Boron</p> <p>Total Boron 0.00</p> <p>WS Boron 0.00</p> <p>Che Boron 0.00</p> | | <p>Cobalt</p> <p>Total Cobalt 0.00</p> <p>WS Cobalt 0.00</p> <p>Che Cobalt 0.00</p> | |
| <p>Magnesium</p> <p>Total Magnesium 0.00</p> <p>WS Magnesium 0.00</p> | | <p>Copper</p> <p>Total Copper 0.00</p> <p>WS Copper 0.00</p> <p>Che Copper 0.00</p> | | <p>Iron</p> <p>Total Iron 0.00</p> <p>WS Iron 0.00</p> <p>Che Iron 0.00</p> | |
| <p>Sulfur</p> <p>Total Sulfur 0.00</p> <p>Free Sulfur 0.00</p> | | <p>Manganese</p> <p>Total Manganese 0.00</p> <p>WS Manganese 0.00</p> <p>Che Manganese 0.00</p> | | <p>Molybdenum</p> <p>Total Molybdenum 0.00</p> <p>WS Molybdenum 0.00</p> <p>Che Molybdenum 0.00</p> | |
| | | <p>Zinc</p> <p>Total Zinc 0.00</p> <p>WS Zinc 0.00</p> <p>Che Zinc 0.00</p> | | | |
| <p>Non-Nutrient Metals ▲</p> | | | | | |
| <p>Arsenic 0</p> | <p>Cadmium 0</p> | <p>Mercury 0</p> | <p>Nickel 0</p> | <p>Lead 0</p> | <p>Selenium 0</p> |
| <input checked="" type="button" value="Update"/> <input type="button" value="Cancel"/> | | | | | |

Technical Info

The *Technical Info* tab is where additional physical and chemical properties for the inventory item are added. This information is necessary for more complex blending and/or use of new or non-traditional fertilizer materials.

Item Code* Is Active

Mix Name* Account Number

Description

General Info | Grade Info | **Technical Info** | Advance API Info

Physical Characteristics ▾

Fluid

Bulk Density

Specific Gravity

Percent Water

Percent Clay

Chemical Characteristics ▾

Ammonia Balance

Heat Capacity

Heat of Solution

Heat of Reaction

Liquid Phase

CaCO3 Equivalent

Coated / Chelated ▾

Poly Coated Sulfur Coated Chelated

Slow Release Information ▾

1 Month

3 Months

6 Months

9 Months

12 Months

15 Months

Solubility Information ▾

Solubility 32F (% Water) - Low Potash

Solubility 32F (% Water) - High Potash

Solubility 77F (% Water) - Low Potash

Solubility 77F (% Water) - High Potash

Fluid – this should be selected for liquid items. It manages how some of the calculations of the formulations are made.

Bulk Density – specific gravities (amounts from 0 - 3), pounds per gallon (amounts from 3 - 20), or pounds per cubic foot (amounts above 20) may be entered. If the item will not be spread or mixed with another item to be spread, then the accuracy of this value is less important.

Specific Gravity – by definition, *Specific Gravity* is the ratio of the density, the mass or unit volume of a substance, to the density of a given reference material.

Percent Water – the total water percentage in the displayed fertilizer.

Percent Clay – the percentage of suspension clay in the displayed fertilizer.

Ammonia Balance – the percentage of free ammonia in the displayed fertilizer.

Heat Capacity – the amount of heat required to raise one hundred pounds of the displayed item one degree Fahrenheit.

Heat of Solution – the amount of heat released when 100 pounds of the displayed item is dissolved in water.

Heat of Reaction – the amount of heat generated when 100 pounds of the displayed item is reacted with one pound of ammonia.

Liquid Phase – the percent liquid phase of the current item used in ammoniation - granulation models.

CaCO₃ Equivalent – the lime equivalent to the displayed item.

Chelated – designates the displayed item as chelated. It should also be selected if the item has been stabilized using one of the Agrotain[®] nitrogen stabilizing products.

Poly Coated – designates the displayed item as Polymer Coated.

Sulfur Coated – designates the displayed item as Sulfur Coated.

Slow Release Information – there are 6 levels of release rates that may be specified for each item in inventory. These must total 100 and form-U-net sets it programmatically.

Solubility Information – the solubility is the percentage of water necessary to prevent salt out of the material at the indicated temperatures when varying levels of Potash are included.

Agvance API Info

Items in form-U-net may be linked to products in Agvance.

The *Settings / Agvance API* tab must be populated in order for this tab to be enabled.

Item Code*
Is Active

Mix Name*
Account Number

Description

| | | | |
|--------------|------------|----------------|------------------|
| General Info | Grade Info | Technical Info | Agvance API Info |
|--------------|------------|----------------|------------------|

Agvance API Product Mapping

Clicking "Search For Item" will display available Agvance items to select for mapping. Clicking "Clear Mapping" will clear the mapping setup.

Agvance Product GUID:

Location: DeptID: ProdID:

Agvance Product Name:

Agvance Alternate Product ID:

Search For Item – find the product in Agvance with which to link the item. When the product is selected, the *Agvance Product GUID*, *Location*, *DeptID*, *ProdID*, and *Agvance Product Name* are entered by default.

Clear Mapping – resets the information back to the default.

Agvance Alternate Product ID – enter the Alternate Product ID if it exists for the Agvance product.

Customer Information

Information is set up and stored for the customers to be used with form-U-net.

Customer Information:

+ Add New Customer ✓ Save Grid Sort Show Inactive Customers

| Customer ID | Customer/Business Name | First Name | Last Name | |
|-------------|--------------------------------|------------|------------|-------------------------------------|
| 1AllAm | All American Farms | William | Gregg | <input type="button" value="Edit"/> |
| 1AndBa | Barry Anderson | Barry | Anderson | <input type="button" value="Edit"/> |
| 1CowBo | Bob Cowgill | Bob | Cowgill | <input type="button" value="Edit"/> |
| 1Cryst | Crystal Creek Farms, Inc. | John | Smith | <input type="button" value="Edit"/> |
| ET | Elizabeth Thrall | Elizabeth | Thrall | <input type="button" value="Edit"/> |
| 1HamHe | Helen Hammond | Helen | Hammond | <input type="button" value="Edit"/> |
| 1SmJo | Joe Smith | Joe | Smith | <input type="button" value="Edit"/> |
| 1KasFe | Kaskaskia Fertilizer & Oil Co. | Tim | Jones | <input type="button" value="Edit"/> |
| KN | Kristin Nottingham | Kristin | Nottingham | <input type="button" value="Edit"/> |
| 1BakLa | Larry Baker | Larry | Baker | <input type="button" value="Edit"/> |

1 2 10 items per page 1 - 10 of 11 items

To add a new customer, click the **Add New Customer** button at the top left of the *Customer Information* window.

Add a Customer

Customer ID*:

Customer / Business Name*:

First Name: Last Name:

Addresses Phone Numbers Emails Preferences

Fill in as much information as possible about the customers. The only two fields that must be completed are shown with asterisks in the *Add a Customer* window, *Customer ID* and *Customer/Business Name*.

The Customer Information section holds multiple addresses, phone numbers, email addresses, etc. Addresses may be specified as *Mailing* or *Shipping* address types. This offers flexibility to print a formulation with a *Mail To Customer* that is different from the *Ship To Customer*. An individual customer could have a different *Mail To Address* than the actual *Ship To Address* for the formulation.

Addresses, phone numbers, and email addresses may be selected as *Primary* by checking the *Is Primary* checkbox. Only one address for each customer may be set as *Primary*. When an Address is set as *Primary*, it is moved to be the first address listed. The same is true for Phone Numbers and Emails. **Delete** buttons are provided on the *Addresses*, *Phone Numbers*, and *Emails* tabs to assist with periodic clean up.

Important information is kept on the *Preferences* tab. The *Active* checkbox is selected by default. To mark a customer as *Inactive*, uncheck this box.

The screenshot shows a window titled "Add a Customer" with a tabbed interface. The "Preferences" tab is selected. It contains the following fields and controls:

- Customer ID*: [Text Input]
- Customer / Business Name*: [Text Input]
- First Name: [Text Input]
- Last Name: [Text Input]
- Default Price Level: [Dropdown Menu]
- Is Active:
- Account Import/ Export Code: [Text Input]
- [Update] [Cancel]

The *Account Import / Export Code* is designed to hold information needed for importing or exporting a customer list with form-U-net. This feature is still under development.

The *Default Price Level* is a very important field designating individual customers as being any one of the 5 *Price Levels* for items in form-U-net. If no *Price Level* is designated, the customer will be *Price 1*. The customer's *Default Price Level* may override the *Price Level* set on a Material Group. When that customer is selected to be used for a formulation, choose to use the Customer's pricing or to continue to use the Material Group's *Price Level*. The *Default Price Level* will be used on formulations provided the customer is selected as the *Ship To Customer* or the *Mail To and Ship To Customer*. If two different customers are selected for a formulation, the *Ship To Customer's Default Price Level* will be used.

Settings

Preferences Tab

After selecting the desired preferences, select the **Save Preferences** button.

Reset Preferences sets the preferences back to the default settings.

General Preferences

The screenshot shows the 'User Settings' window with the 'Preferences' tab selected. It is divided into two main sections: 'General Preferences' and 'Printing Preferences'. The 'General Preferences' section has a single checked checkbox: 'Notify me upon logging into form-U-net when changes have been made.' The 'Printing Preferences' section has three sub-tabs: 'Mix Sheet', 'Quote Sheet', and 'File Sheet'. Under the 'Mix Sheet' tab, there are six unchecked checkboxes: 'Show two decimal places in Grade for Primary Nutrients', 'Show long Grade (Primary, Secondary, and Minor Nutrients)', 'Omit blend summary (Price, Acres, Rate per Acre) for Acre mode formulations', 'Always show two decimal places for items not mixed in pounds', 'Omit blend summary Price per Acre for Acre mode formulations', and 'Print signature line'. At the bottom of the 'Printing Preferences' section, there is a label 'View / Update Multiple Document Printing Preferences:' followed by a 'Show Preferences' button. At the very bottom of the 'User Settings' window, there are 'Save Preferences' and 'Reset Preferences' buttons.

Notify me upon logging into form-U-net when changes have been made – may be selected to display a notification upon logging in if updates have been applied since the previous login.

Printing Preferences

View / Update Multiple Documents Printing Preferences – when the **Show Preferences** button is selected, the *Multiple Document Printing Preferences* window displays. A default *Number of Copies* may be selected to print for the Mix Sheet, Quote Sheet, and File Sheet when the *Print / Print Multiple Documents* menu is selected on the *Formulation* window.

Print Multiple Documents

Your default settings are listed below.

To change these default settings for future print operations, navigate to the Preferences tab of the Settings view.

| | |
|---|---------------------|
| <input checked="" type="checkbox"/> Print Mix Sheet | Number of Copies: 1 |
| <input type="checkbox"/> Print Quote Sheet | Number of Copies: 0 |
| <input type="checkbox"/> Print File Copy | Number of Copies: 0 |

Mix Sheet

User Settings

Preferences Profile Utilities Advance API

General Preferences:

Notify me upon logging into form-U-net when changes have been made.

Printing Preferences:

Mix Sheet Quote Sheet File Sheet

- Show two decimal places in Grade for Primary Nutrients
- Show long Grade (Primary, Secondary, and Minor Nutrients)
- Omit blend summary (Price, Acres, Rate per Acre) for Acre mode formulations
- Always show two decimal places for items not mixed in pounds
- Omit blend summary Price per Acre for Acre mode formulations
- Print signature line

View / Update Multiple Document Printing Preferences:

Show two decimal places in Grade for Primary Nutrients – may be selected to display two decimal places in the Grade for the primary nutrients on the Mix Sheet.

Show long Grade (Primary, Secondary, and Minor Nutrients) – displays the full analysis, including Primary, Secondary, and Minor Nutrients on the Mix Sheet.

Omit blend summary (Price, Acres, Rate per Acre) for Acre mode formulations – when selected, the Blend Summary will not be included on the Mix Sheet for Acre mode formulations.

Always show two decimal places for items not mixed in pounds – when selected, quantities are rounded to two decimal places on the Mix Sheet.

Omit blend summary Price per Acre for Acre mode formulations – when selected, the Price per Acre will not display on the Mix Sheet when formulating in Acre mode.

Print Signature Line – prints a signature line at the bottom of the Mix Sheet.

Quote Sheet

The screenshot shows the 'User Settings' dialog box with the 'Printing Preferences' section selected. The 'Quote Sheet' tab is active. Under 'General Preferences', the checkbox 'Notify me upon logging into form-U-net when changes have been made.' is checked. Under 'Printing Preferences', the following options are listed, all with unchecked checkboxes:

- Show two decimal places in Grade for Primary Nutrients
- Show long Grade (Primary, Secondary, and Minor Nutrients)
- Show individual item prices for mixed items
- Show Extended Analysis info (Requested & Actual) for Acre mode formulations
- Print signature line
- Omit blend summary Price per Acre for Acre mode formulations

At the bottom of the 'Printing Preferences' section, there is a link 'View / Update Multiple Document Printing Preferences:' and a 'Show Preferences' button. At the bottom of the entire dialog box, there are 'Save Preferences' and 'Reset Preferences' buttons.

Show two decimal places in Grade for Primary Nutrients – may be selected to display two decimal places in the Grade for the primary nutrients on the Quote Sheet.

Show long Grade (Primary, Secondary, and Minor Nutrients) – displays the full analysis, including Primary, Secondary, and Minor Nutrients on the Quote Sheet.

Show individual item prices for mixed items – may be selected to display the individual mixed items' prices in the *Pricing* table of the Quote Sheet.

Show Extended Analysis info (Requested & Actual) for Acre mode formulations – prints the Extended Analysis information on the Quote Sheet.

Print Signature Line – prints a signature line at the bottom of the Quote Sheet.

Omit blend summary Price per Acre for Acre mode formulations – when selected, the Price per Acre will not display on the Quote Sheet when formulating in Acre mode.

File Sheet

The screenshot shows the 'User Settings' window with the 'Printing Preferences' section selected. The 'File Sheet' tab is active. The 'General Preferences' section has a checked box for 'Notify me upon logging into form-U-net when changes have been made.' The 'Printing Preferences' section has several unchecked options: 'Show two decimal places in Grade for Primary Nutrients', 'Show long Grade (Primary, Secondary, and Minor Nutrients)', 'Show individual item prices for mixed items', 'Always print pricing section on a new page', 'Omit blend summary (Price, Acres, Rate per Acre) for Acre mode formulations', 'Show Extended Analysis info (Requested & Actual) for Acre mode formulations', 'Print signature line', and 'Omit blend summary Price per Acre for Acre mode formulations'. At the bottom, there are buttons for 'View / Update Multiple Document Printing Preferences: Show Preferences', 'Save Preferences', and 'Reset Preferences'.

Show two decimal places in Grade for Primary Nutrients – may be selected to display two decimal places in the Grade for the primary nutrients on the File Sheet.

Show long Grade (Primary, Secondary, and Minor Nutrients) – displays the full analysis, including Primary, Secondary, and Minor Nutrients on the File Sheet.

Show individual item prices for mixed items – may be selected to display the individual mixed items' prices in the *Pricing* table of the File Sheet.

Always print pricing section on a new page – when selected, the formulation's cost, price, margin, and pricing table will print on a new page of the File Sheet.

Omit blend summary (Price, Acres, Rate per Acre) for Acre mode formulations – when selected, the Blend Summary will not be included on the File Sheet for Acre mode formulations.

Show Extended Analysis info (Requested & Actual) for Acre mode formulations – prints the Extended Analysis information on the File Sheet.

Print Signature Line – prints a signature line at the bottom of the File Sheet.

Omit blend summary Price per Acre for Acre mode formulations – when selected, the Price per Acre will not display on the File Sheet when formulating in Acre mode.

Profile Tab

The screenshot shows the 'User Settings' window with the 'Profile' tab selected. The window is divided into several sections:

- Contact Information:** Includes a text field for 'Contact Name / Business Name*', and separate text fields for 'First Name:', 'Middle:', 'Last Name:', and 'Suffix:'. There is also a 'Slogan:' text field.
- Addresses:** A sub-section with tabs for 'Addresses', 'Phone Numbers', and 'Emails'. It contains an 'Address' form with fields for 'Address Line 1:' (containing '140 E South First St'), 'Address Line 2:', 'City:' (containing 'Shelbyville'), 'State:' (containing 'IL'), and 'Zip:' (containing '62565'). There is a dropdown for 'Address Type:' set to 'Shipping', a 'Delete Address' button, and a checked 'Is Primary:' checkbox. An 'Add Address' button is located below the form.
- Change Password:** Includes three text fields for 'Current Password:', 'New Password:', and 'Confirm Password:', followed by a 'Submit' button.

At the bottom of the window, there are two buttons: 'Save Contact Info' and 'Reset Contact Info'.

Optionally, enter the Contact Information, including Addresses, Phone Numbers, and Emails. On the bottom of the window, the password may be reset. Enter in the *Current Password* for verification, and then enter the *New Password* and confirm this. Selecting **Submit** will save this change and reset the password.

Utilities Tab

The *Utilities* tab contains a tool allowing an items' prices to be calculated by *Item Type*, *Price Level*, *Margin %*, etc.

The screenshot shows the 'User Settings' window with the 'Utilities' tab selected. The 'Calculate Prices' section contains a toolbar with '+ Add new record' and '✓ Save Changes'. Below is a table with the following data:

| Select | Price Level | Item Type | \$/Unit | Margin % | Rounding | Shrink | |
|--------------------------|-------------|-------------|----------|----------|----------|--------------------------|-------------------|
| <input type="checkbox"/> | 1 | Fert... | \$0.00 | 0.00 | None | <input type="checkbox"/> | ✓ Update ✕ Cancel |
| <input type="checkbox"/> | 1 | Fertilizers | \$200.00 | 100.00 | None | <input type="checkbox"/> | ✎ Edit ✕ Delete |

For example, in the *Add New Record* area, set the *Price Level* to 2, and the *Item Type* to *Fertilizer*. Set the *\$/Unit* to \$5 and the *Margin %* to 25. Round this to the nearest dollar. Then, select the **Update** button. The **Save Changes** button is now available to save these changes.

The screenshot shows the 'User Settings' window with the 'Utilities' tab selected. The 'Calculate Prices' section contains a toolbar with '+ Add new record' and '✓ Save Changes & Submit Selected'. Below is a table with the following data:

| Select | Price Level | Item Type | \$/Unit | Margin % | Rounding | Shrink | |
|-------------------------------------|-------------|-------------|----------|----------|----------|--------------------------|-----------------|
| <input checked="" type="checkbox"/> | 2 | Fertilizers | \$5.00 | 25.00 | None | <input type="checkbox"/> | ✎ Edit ✕ Delete |
| <input type="checkbox"/> | 1 | Fertilizers | \$200.00 | 100.00 | None | <input type="checkbox"/> | ✎ Edit ✕ Delete |

To apply the price calculation to items, check the *Select* option on the desired row, and then select the **Save Changes & Submit Selected** button. The calculation is as follows. If one of the items has a cost of \$800, the example of \$5/ton plus a 25% margin rounded to the nearest dollar would mean:

$$(\$800 + \$5) / (100\% - 25\%) = 805 / 0.75 = \$1073$$

It is possible to edit the record and select the *Shrink* option, and then submit this same calculation. The result now is:

$$(\$800 / (100\% - 25\%)) + \$5 = 1,066.66 + 5 = \$1072$$

This creates a great deal of flexibility in spreading a consistent margin across all the items in form-U-net.

Another example includes a 25% normal margin on fertilizer that is set to *Price 1*. For an early booking program, set up *Price 2* to be \$5/ton off of *Price 1*. To accomplish this, set *Price 2* to have the same 25% margin, but set the *\$/Unit* to be -5, and also select the *Shrink* option. The calculation on an item with an \$800/ton cost is:

$$(800 / (100\% - 25\%)) + -5 = \$1,062$$

Agvance API Tab

Agvance API Setup

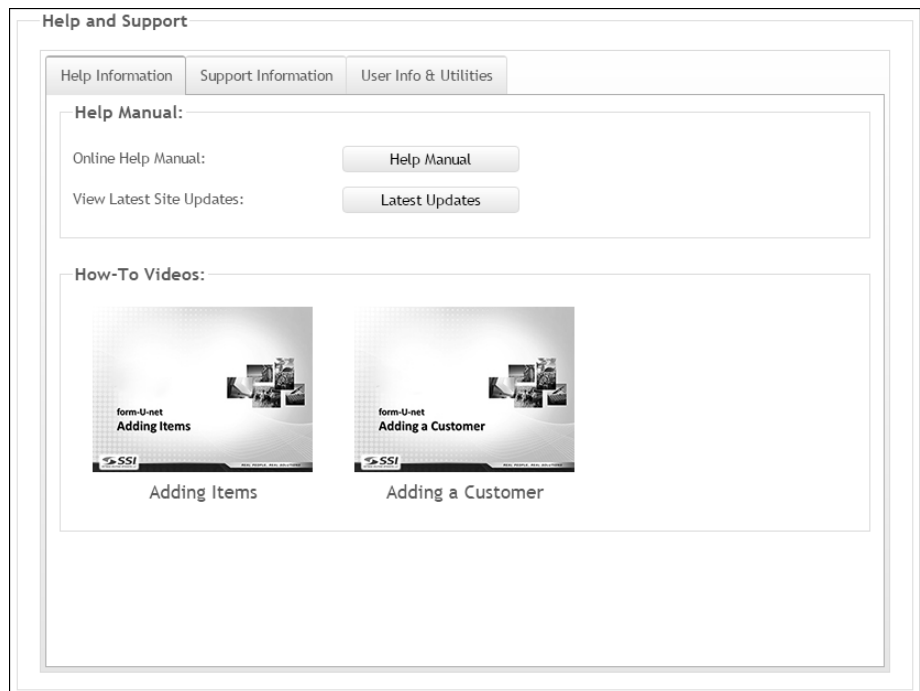
Enter the Agvance API setup information to integrate form-U-net with Agvance. After information is entered and/or changed, select the **Test API Settings** button to ensure the information is valid. Choose **Save API Settings** to save the information. These settings may be cleared by selecting the **Clear API Settings** button.

Material System to Agvance Product Set Mapping

Select the Material Groups in form-U-net to link with the Product Set in Agvance. Choose **Save Mappings** to save the information. To reset this information back to the default, select **Reset Mappings**.

Help

Help Information Tab

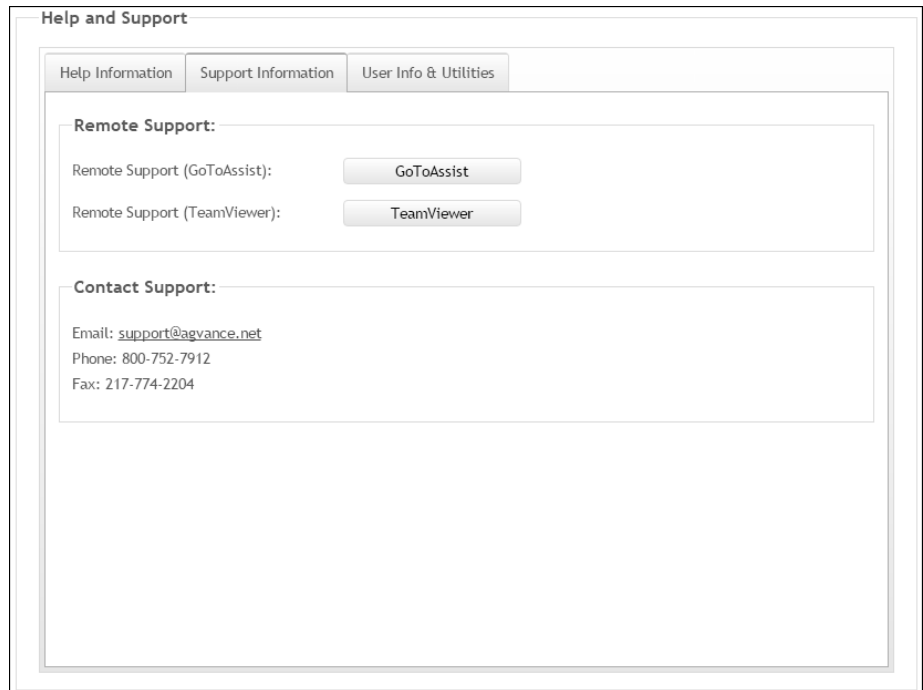


The *Help Information* tab offers assistance through the form-U-net Help Manual and How-To Videos.

The Help Manual may be viewed by selecting the **Help Manual** button. To view recent updates to form-U-net, select **Latest Updates**.

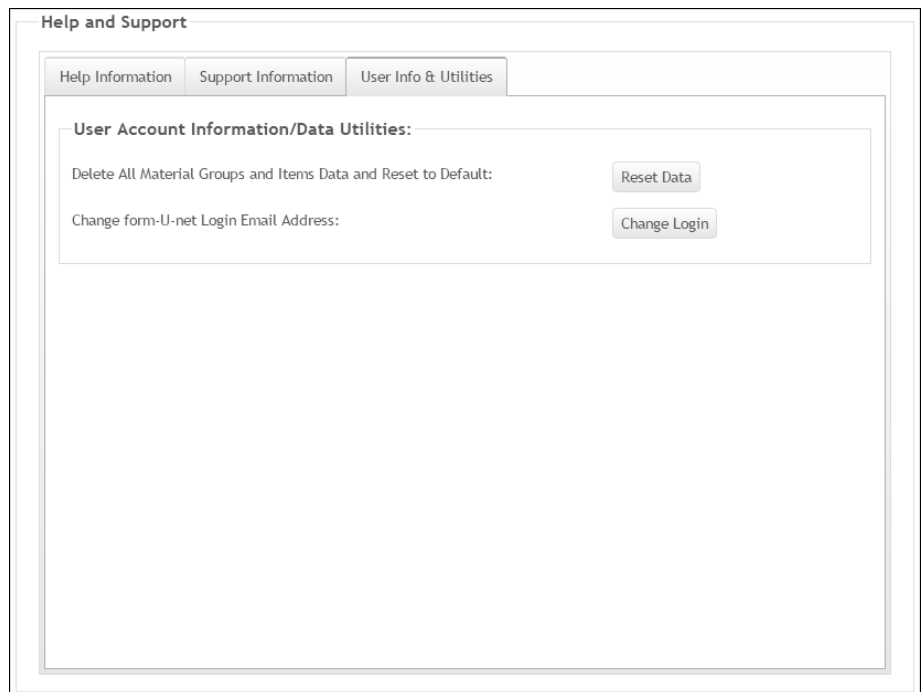
View training videos by selecting the necessary video.

Support Information Tab



SSI Support may be contacted remotely using the *GoToAssist* and *TeamViewer* links or by phone or email.

User Info & Utilities Tab



Login information may be edited using the **Change Login** button. The *Change form-U-net Login* window displays and allows a *New Login Email Address* to be

entered. The *Support Password* is obtained from SSI and must be entered to save. Select the **Submit Change Request** button to save these changes.

form-U-net Updates

Latest Updates

November 9, 2016

Item Information

Adding an Item – When items are added, the grid correctly displays on the first page.

Previous Updates

November 1, 2016

Customer Information

Adding a Customer – When adding a customer from any list available in form-U-net, the program redirects to the first page of the list of customers. All customer lists are updated when a customer is added.

September 30, 2016

Settings

Quote Sheet and File Sheet Preference – The *Omit blend summary Price per Acre for Acre mode formulations* option was added to the *Quote Sheet* and *File Sheet* tabs. When selected, the Price per Acre will not display on the Quote Sheet and/or File Sheet when formulating in Acre mode.

September 2, 2016

Item Information / Customer Information

Adding New Records – An unlimited number of items and customers may be added, regardless of the number of items or customers being viewed. Additionally, new records display first in the list.

Material Groups

Products in Group – Inactive items do not display in the *Products in Group* grid.

Settings

Signature Line – A *Print Signature Line* option was added to the *Mix Sheet*, *Quote Sheet*, and *File Sheet* tabs. When selected, a signature line prints on the selected formulation sheet.

July 22, 2016

Formulation

File Sheet Pricing – When the *Always print pricing section on a new page* option is selected for the File Sheet, the formulation's cost, price, and margin print on a new page along with the pricing section.

July 1, 2016

Item Information

Active Items – An *Is Active* checkbox was added to the Item Card to mark an item as active. If not selected, the item will be considered inactive, and will not display in any Material Group. If an item already exists in a Material Group, the item may not be marked inactive.

Settings

Mix Sheet Preference – The *Omit blend summary Price per Acre for Acre mode formulations* option was added to the *Preferences / Mix Sheet* tab. When selected, the Price per Acre will not display on the Mix Sheet when formulating in Acre mode.

June 10, 2016

Formulation

Deleting Formulations – The *Delete Saved Formulations* window remains open until manually closed after a formulation is deleted.

Viewing Comments – A **Save Grid Layout** button was added to the *Print from a Saved Formulation*, *Export Saved Formulation to Agvance*, and *Delete Saved Formulation* windows. Columns in the window may be reordered, resized, sorted, filtered, or excluded and the grid saved to default in the selected layout.

Material Groups

Chelated Zinc – When Chelated Zinc is added to a Material Group, it displays correctly on the *Edit Data* grid and the *Formulation* window.

May 20, 2016

Customer Information

Customer Information Grid – The customer's *First Name* and *Last Name* display in the grid rather than the *Account Number*.

Formulations

Application Rate – When *Application Rate* is enabled for the Material Group, the *Application Rate* defaults to ‘0.00’ if formulating in *Grade Mode*.

Product Temperature – When a Material Group is selected that uses the *Product Temperature* feature, no additional Water items are added to the Material Group.

Settings

Printing Preferences – The preferences for the Mix Sheet, Quote Sheet, and File Sheet reports are included on their respective tabs.

May 4, 2016

Formulations

Delete Saved Formulations – The *Saved Formulations* menu contains a *Delete Saved Formulations* option. When selected, formulations may be chosen to be deleted from form-U-net.

Item Pricing Report – The *Print Item Pricing Report* option was added to the *Print* menu. An *Item Type* and/or costs may be selected to print on the report.

Item Information

Item Description – The *Description* for an item may be up to 45 characters.

Settings

API Settings – When making changes to the *Agvance API Setup* area on the *Agvance API* tab, the **Save API Settings** button is only available after the **Test API Settings** button is selected. This ensures the API settings are valid before saving the setup.

April 8, 2016

Formulation

Formulation Analysis – An *Analysis* area displays in the *Formulation Results* section of the *Formulation* window.

Printout Display – The word ‘form-U-net’ was removed from the Mix Sheet, Quote Sheet, and File Sheet printouts. Previously saved sheets continue to display ‘form-U-net’.

Material Groups

Mix Name – The *Edit Data* window displays the item’s name correctly in the *Mix Name* column.

March 18, 2016

Formulation

Formulation Export – A formulation may be exported to Agvance without error when the *Mixing Units* on an item in form-U-net are set to *Volumetric Units* and the Blending units match in Agvance.

Resizing Columns – Columns resize correctly on the *Select a Saved Formulation* grid.

Settings

Quantity Rounding – A *Mix Sheet - Always show two decimal places for items not mixed in pounds* option was added to the *Printing Preferences* on the *Preferences* tab. When selected, quantities are rounded to two decimal places on the Mix Sheet.

March 2, 2016

Formulation

Calculating Results – When an active formulation is open, the mode can be switched from *Grade* to *Acre*, or vice versa, and accurate formulation results are calculated.

February 9, 2016

Formulation

Comments on a Formulation – A *Comments* column was added to the *Select a Saved Formulation* window to display the comments on a formulation.

Default Information for Export – The *Export Saved Formulation* window populates the *Location ID* and *Product Set* for customers who have a matching ID in Agvance and Form-U-net.

December 15, 2015

Formulation

Export Saved Formulation – Saved formulations may be exported into Agvance Blend Tickets.

Two Decimal Accuracy – When *Nitrogen Detail* is selected on the *MyGroup Settings* window, the *Quote Sheet* and *File Sheet* include two decimal accuracy, regardless if the *Quote Sheet* or *File Sheet – Show two decimal places in Grade for Primary Nutrients* option is selected on the *Settings / Preferences* tab.

Material Groups

Fluid Mixing – When *Fluid Mixing* is selected as the *Material System* and the *Control Total Water* option is chosen on the *Edit Information* window, a notification states that the *Evaporation Key Item* must be properly setup in the *Material Groups / MyGroup Settings* to formulate correctly.

November 17, 2015

Help

Help and Support – The *Help* area was reconfigured and now contains three tabs, including *Help Information*, *Support Information*, and *User Info & Utilities*. Additionally, the *Help Information* tab includes training videos.