

Manure Use Plan For Nebraska Spreadsheet Instructions

The Manure Use Plan Spreadsheet was designed to help producers estimate the nutrient value of manure and accurately credit those nutrients against the nutrient requirements of a crop. It will assist the producer in creating an individual field plan for manure and fertilizer application and maintaining records required by environmental regulatory agencies.

Julie S. Paschold
Extension Water Quality Specialist
University of Nebraska–Lincoln

Rick K. Koelsch
Livestock Environmental Engineer
University of Nebraska–Lincoln

Contact:
Rick K. Koelsch
Department of Biological Systems Engineering
University of Nebraska–Lincoln
Lincoln, NE 68583-0726
rkoelsch1@unl.edu
(402) 472-4051

August 2006



Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln cooperating with the Counties and the United States Department of Agriculture.

University of Nebraska–Lincoln Extension educational programs abide with the nondiscrimination policies of the University of Nebraska–Lincoln and the United States Department of Agriculture.

© 2006, The Board of Regents of the University of Nebraska on behalf of the University of Nebraska–Lincoln Extension. All rights reserved.

Table of Contents

Worksheet Instructions for:

Introduction.....	3
Contact Information	7
Potential Fields for Manure Application	9
Manure Analysis Records	11
Manure Nutrient Availability Calculator	17
Entry Form For Individual Field Cropping Plan	20
Nitrogen Balance Calculator	23
Phosphorus Balance Calculator	25
Action Plan	27
Portion of Manure Utilized by Cropping Plan	29
NRCS “Nutrient Budget Jobsheet”	31

Computing Requirements

The *Manure Use Plan Spreadsheet* was developed for Microsoft Excel 2000®. File size is about 3,000,000 bytes.

Resources

For other titles in this nutrient management spreadsheet series, visit the UNL Comprehensive Nutrient Management Planning (CNMP) Web site at <http://cnmp.unl.edu>.

Introduction Worksheet Instructions

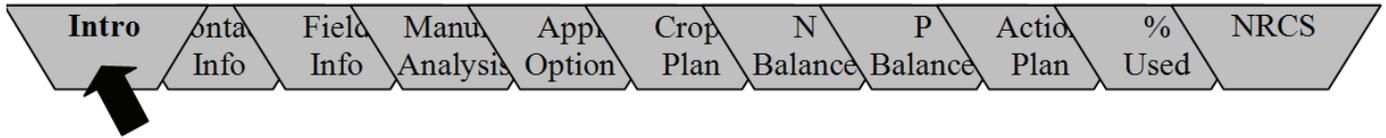


Figure 1. Click on tabs to move to various worksheets.

Regulatory Requirements

In Title 130 Regulations the Nebraska Department of Environmental Quality (NDEQ) requires a manure nutrient management plan (MNP) as a part of the permit application for a livestock waste control facility (LWCF). This MNP requires that a producer document manure and effluent sampling and analysis procedures, land application soil sampling and analysis procedures, and planned application rates, methods and frequencies. This tool should help livestock producers preparing the annual plan describing the appropriate application rate of manure and fertilizer, a fundamental requirement of the federal and state permit program. It will allow the producer to estimate the nutrient value of manure and credit those nutrients against crop requirements over several years. This spreadsheet also will help in maintaining records of land application and manure sampling after the application process.

Purpose

The *Manure Use Plan Spreadsheet* was designed to help producers estimate the nutrient value of manure and accurately credit those nutrients against the nutrient requirements of a crop. This information is combined with other fertilizer and nutrient credits to determine a nitrogen and phosphorus balance on individual fields. Finally, it will provide a summary *Action Sheet* for the recommended manure and fertilizer application rates selected by the producer. This *Action Sheet* can be shared with the operator for manure and fertilizer application equipment to identify the desired application rates.

To accomplish this, 11 Microsoft Excel® worksheets are available (Figure 2). They may be accessed by clicking on the appropriate “Name” tab found at the bottom of each worksheet (Figure 1).

CAUTION

Recognize that many factors affect manure nutrient availability. The estimates contained in this spreadsheet represent a reasonable estimate for typical Nebraska conditions, but may not be representative of individual situations.

Intro	Opening worksheet describes purpose of the spreadsheet
Contact Info	Provides place for producer and advisor contact information
Field Info	Identifies field specific information for sites that may be used for manure application
Manure Analysis	Maintains a list of facilities from which manure is collected, collects manure analysis results, and maintains a log of past manure analysis results
Appl Option	Defines the manure application options commonly used on the farm and estimates the availability of manure nutrients from those options
Crop Plan	Allows entry of field and crop specific information for a single year
N Balance	Maintains a historic record of nitrogen credits and balance for each field
P Balance	Maintains a historic record of phosphorus credits and balance for each field
Action Plan	Produces an <i>Action Plan</i> summarizing preferred manure and fertilizer application rates for all fields to receive manure during a single season
% Used	Displays the portion of annual manure production utilized by current cropping plan for each year
NRCS	Displays a <i>Nutrient Budget Job Sheet</i> used by NRCS in Nebraska

Figure 2. Descriptions of each worksheet.

Note: The *Nutrient Rec.* worksheet is a reference table for estimating UNL nitrogen and phosphorus application rates. IT IS NOT FOR USE BY THE USER.

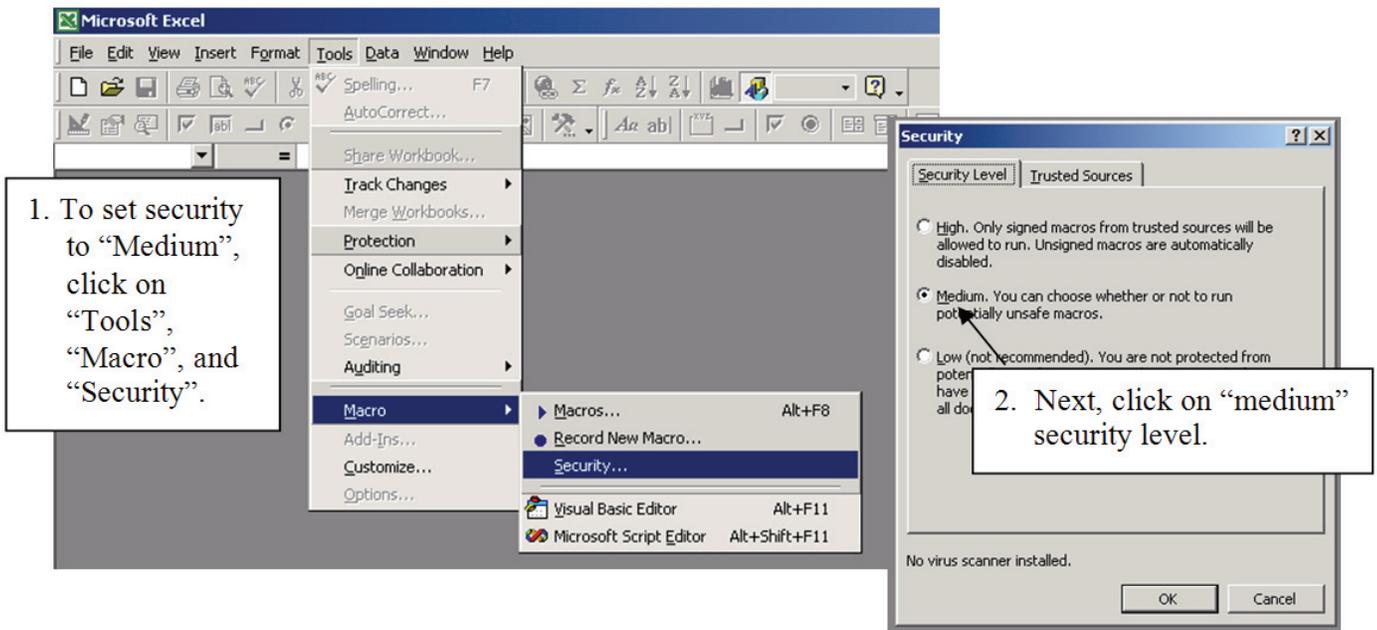


Figure 3. Resetting Excel security to better allow for the use of macros.

Instructions

These instructions are illustrated in *Figures 3 and 4*.

1. **Activating Macros.** This spreadsheet contains many macros which can perform a wide variety of functions. Without these macros, many of the critical spreadsheet functions will be lost. Two steps are necessary to allow use of these macros:

- a. **Enabling Use of Macros.** When Excel is opened (without the *Manure Use Plan* application), the security level for Excel must be set to "Medium." To do this, click on "Tools" on the menu bar, then "Macro," and then "Security." This will expose the Security window. Click on the "Medium" setting.
- b. Next, open the file "#3 Manure Use Plan." Click on the "Enable Macros" button. Once the file is open, test functioning of the macros by clicking on any button on the spreadsheet. If it does not work, repeat Step 1b.

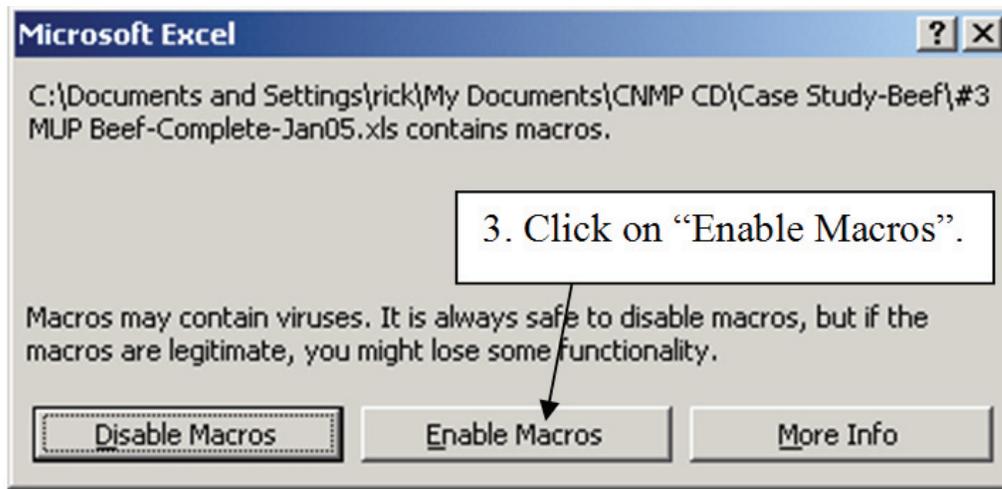


Figure 4. Enabling macros.

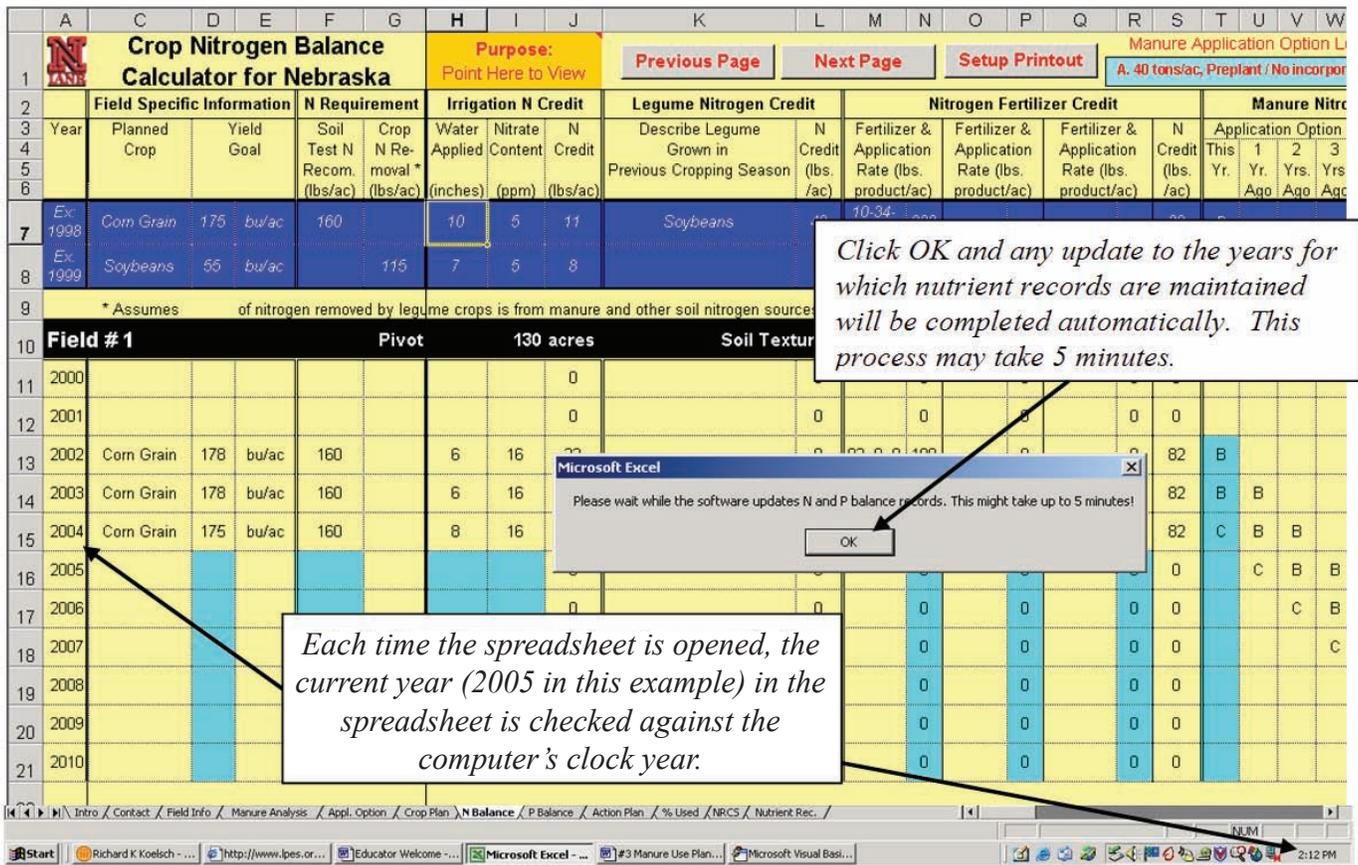


Figure 5. When opened, the spreadsheet will check the years of its records against the computer clock year and update files as necessary.

2. **Opening the file.** When the file is opened, a “Year Check” procedure is run automatically to compare the computer clock’s year against the current year identified in the spreadsheet (Figure 5). The spreadsheet maintains nutrient management plans for the current year, five years into the future, and five years into the past. If the computer clock year indicates that a new year has begun since the spreadsheet was last opened, it will update all of the nutrient management plans so that the current year matches the computer clock. This procedure takes about five minutes. When the procedure is finished, space will be added for a new year’s nutrient management (current year plus five years) and an old nutrient management plan will be erased (plan for current year minus six years).
3. **Save to New File Name.** The next thing you should do after receiving this file is make a copy with a new name. Click on “file” and “save as.” In the “file name” box, replace “#3-Manure Use Plan” with a new name (for example, “#3-Manure Use Plan for John Doe”). This file should be saved periodically as each worksheet is completed to prevent loss from unexpected computer difficulties.
4. **Improve Screen View.** It is best to adjust the information that fits into one screen to ensure that you can see all yellow background (User Viewing Area) within the left to right limits of the screen. Try these steps to adjust your viewing area:
 - a. Click on “View” and then “Zoom.” Adjust the “% Zoom” to your personal preference (Figure 6).
 - b. To maximize the viewing area, select “View” from the menu bar and then “Full Screen.” The unnecessary tool bars should disappear.
 - c. Adjust the screen resolution by clicking on “Start,” then “Settings,” then “Display,” and then “Settings” again. You can adjust screen size by going to a higher resolution such as “1280 x 1024” or “1400 x 1050.” Generally the higher resolution will produce better viewing. If the text is difficult to read, increase its size with “Step a” above.
5. For some worksheets, including the *Introduction* worksheet, the entire contents will not appear on screen. Additional screen information can be viewed by clicking on the “Up” and “Down” arrows on the scroll bar at the right side of the screen and the

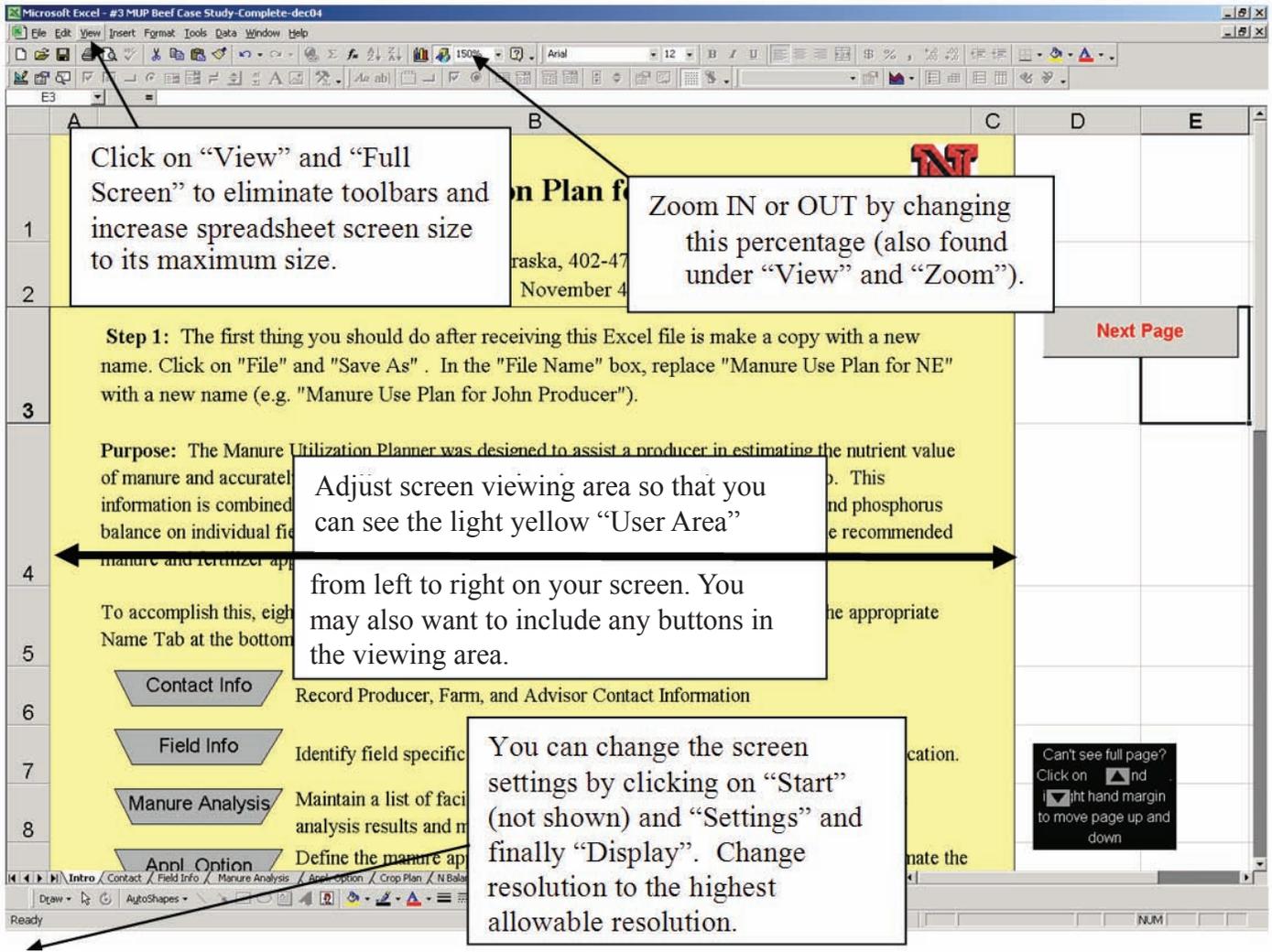


Figure 6. Adjusting “View” settings.

“Left” and “Right” arrows at the bottom right corner of the screen, or use the scroll wheel on the mouse, if available. To move from cell to cell, you may use the arrow keys on your keyboard or hit “enter” or “tab” after typing in the current aqua cell.

6. Color codes are used to assist the user with these worksheets.

Light blue or aqua cells. Producer information is entered in cells colored light blue or aqua in the spreadsheet. These locations are not protected and can be changed or updated as necessary.

Light yellow regions define areas of the spreadsheet for use by the user. Generally, there is no reason for most users to leave the light yellow regions of individual worksheets. Light yellow regions are protected from accidental changes.

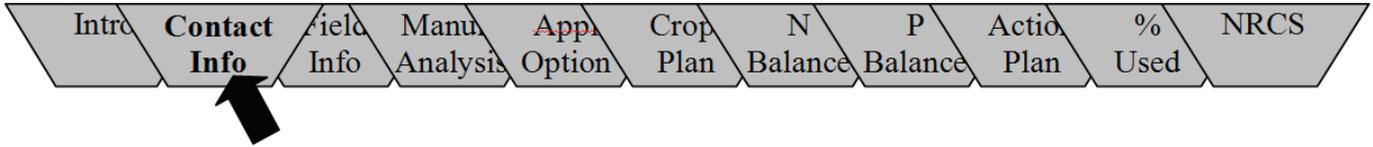
Lavender areas of the worksheet are used by the developer to calculate results and define user functions of the spreadsheet. Generally, most users will not need to view these regions.

Dark blue cells define an example for the user’s information.

Grey rectangles with red text are buttons for assisting with a variety of actions such as moving from one page to the next.

7. When you have finished reviewing the information on the *Intro* worksheet, move to the *Contact Info* worksheet by clicking on the “Next Page” button or “Contact Info” tab on the bottom of page.

Contact Information Worksheet Instructions



Purpose

This worksheet (see *Figure 7*) provides a space to include basic information regarding the producer and advisor completing this analysis.

Instructions

1. If aqua cells are not empty and are incorrect, clear cells by clicking on the “Clear Contact Information” button.
2. Producer information including name (cell E7), address (cells E8, E9, and E10), farm name (cell H7), phone (cell H8), fax (cell H9), and e-mail address (cell H10) may be added as available. The contact person who completed this worksheet, if different from the producer, may include name (cell E12) and phone number (cell H12).
3. After checking the information entered, you are ready to move to the next worksheet. Click on the “Field Info” tab or the “Next Page” button.

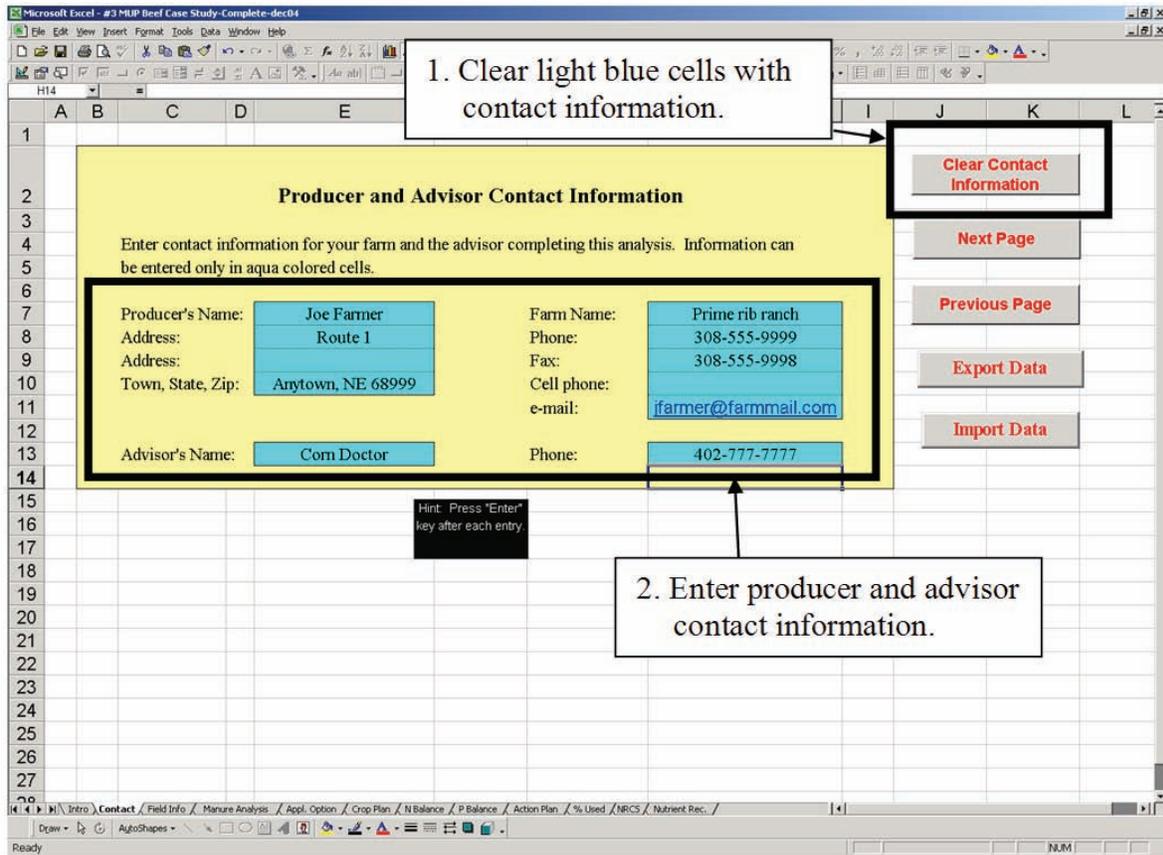


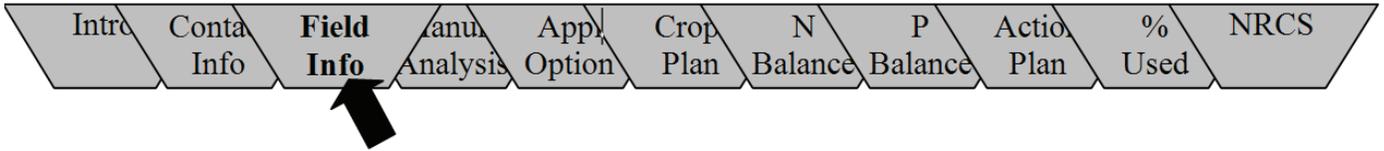
Figure 7. Entering or updating producer contact information.

Example

To illustrate the use of this spreadsheet, an example livestock farm will be used. John Farmer is the manager of a livestock farm that finishes cattle. Information entered in the *Contact Info* worksheet includes:

Producer's Name:	John Farmer
Address:	Route 1
Address:	
Town, State, Zip:	Anytown, NE 68999
Farm Name:	Beef Feedlot
Phone:	308-555-9999
Fax:	308-555-9998
e-mail:	jfarmer@farmmail.com

Potential Fields for Manure Application Worksheet Instructions



Purpose

This worksheet will aid the producer in identifying field specific information for sites that may be used for manure application.

Instructions

1. For each field or management unit, enter the following information:

- Field or management unit name (Column D). This name must begin with a letter and may be up to 30 characters long.
- Soil texture (Column E). Select the best option from the list provided after clicking on the arrow button on the right side of the column.
- Field size in acres (Column F). This value should be acres available for cropping.
- The first year this planner will be used for the field (Column G).

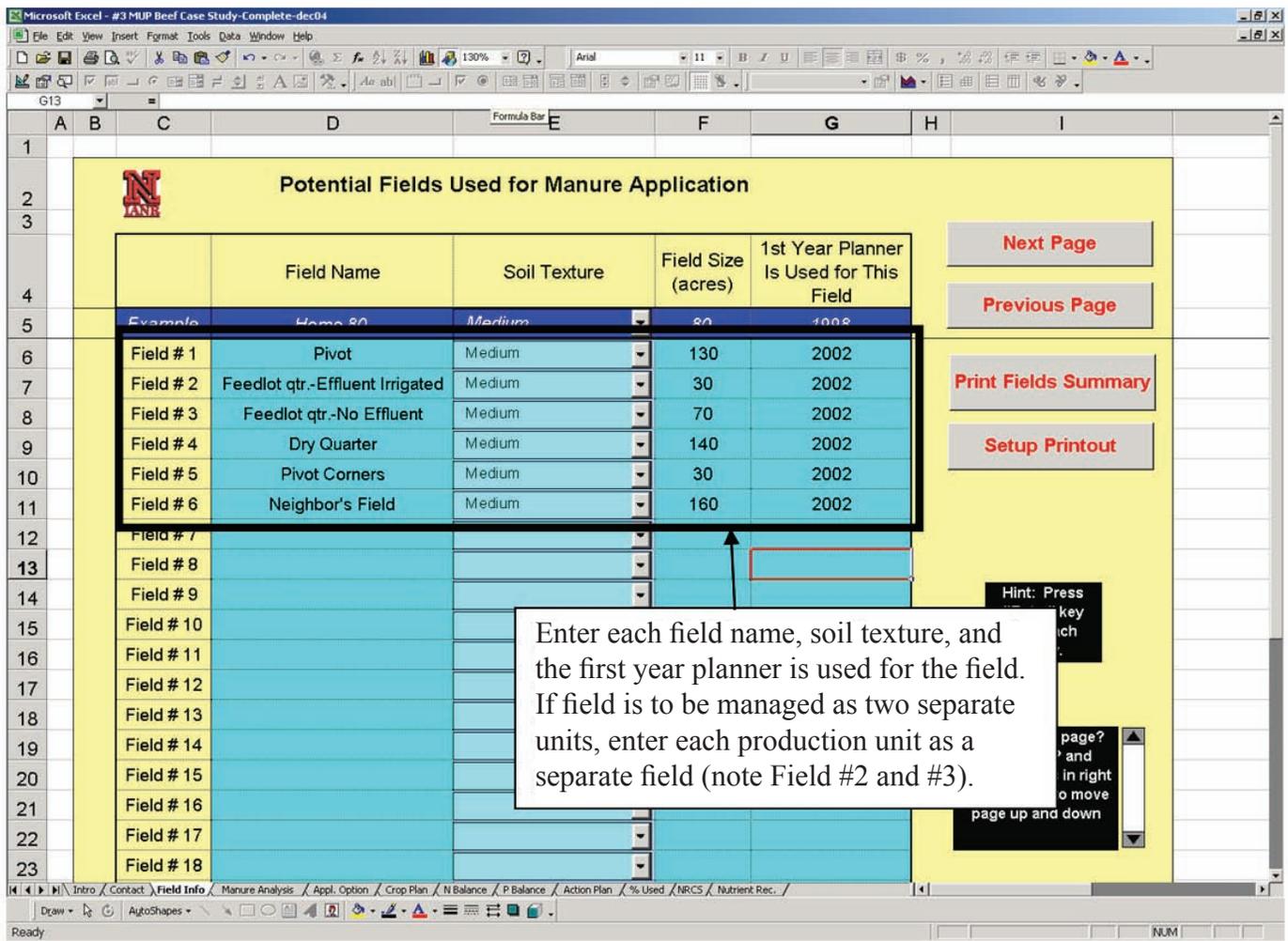


Figure 8. Enter field descriptions for those fields that may receive manure.

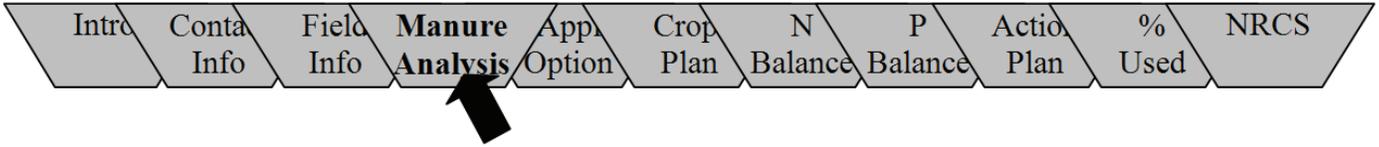
Example

John Farmer has five fields. All are identified with names he recognizes, and all have a medium soil texture. The first year the Planner was used for each field is 2002. Information entered for the first two fields in the *Field Info.* worksheet includes:

Field #1 Name:	Pivot 1
Soil Texture:	Medium
Field Size:	130 (acres)
First Year Planner used for this field:	2002
Field #2 Name:	Feedlot qtr.-Effluent Irrigated
Soil Texture:	Medium
Field Size:	30 (acres)
First Year Planner used for this field:	2002

2. After reviewing this table for accuracy, move to the *Manure Analysis* worksheet by clicking on the “Next Page” button or the “Manure Analysis” tab at the bottom of the page.

Manure Analysis Records Worksheet Instructions



Purpose

This worksheet will:

- 1) maintain a list of all facilities from which manure is collected (*Form 1*);
- 2) allow entry of the results of a manure analysis (*Form 2*); and
- 3) maintain a log of all current and past manure analysis results entered (*Form 3*).

Instructions

1. You may move to any of the three forms on the worksheet by clicking the appropriate buttons, "Form 1: Facilities List," "Form 2: Enter Analysis," or "Form 3: Review Log."
2. **Form 1. Facilities List.** If new information is being entered, clear the information in *Form 1* by clicking on "Clear Form 1." For all facilities from which manure is collected, enter the following the first time you use this tool:
 - a. Manure Source (Column C). Click on the choice that most closely matches your facility after clicking on the arrow button to the right of the column to display possible options.

Manure Analysis Records

This page contains three manure analysis forms:

1. Move to any of the three forms with these buttons

Form 1: Facilities List
Form 2: Enter Analysis
Form 3: Review Log

Form 1. List of Facilities From Which Manure Is Collected

Facility Number	Manure Source	Nutrient Concentration	Application Rate	Annual Quantity of Phosphorus Managed
Example	Swine - Confinement Barn & Deep Pit - Slurry	lbs /1,000 gallons	1,000 gallons/acre	50,000 lbs P ₂ O ₅ /yr
1	Beef - Open Lot - Solid Manure	lbs /ton	tons/acre	181,000 lbs P ₂ O ₅ /yr
2	Beef - Holding Pond - Liquid	lbs./acre-inch	acre-inch/acre	2,000 lbs P ₂ O ₅ /yr
3	Beef - Holding Pond - Solids	lbs./ton	tons/acre	8,000 lbs P ₂ O ₅ /yr
4				lbs P ₂ O ₅ /yr
5				lbs P ₂ O ₅ /yr
6				lbs P ₂ O ₅ /yr

2. Enter manure source and related information.

Hint: Press "Enter" key after each entry.

Hint: Form 2, results immediately below, is for entering results of manure analysis.

below Form 2, lists all manure analysis results that have been entered to date.

Hint: "Annual Quantity of Phosphorus Managed" is estimated by spreadsheet "#2 Nutrient Inventory".

After entering your farms data, this value is shown on the "Store Loss" page under "P₂O₅ after Losses".

Next Page
Previous Page

Figure 9. Three forms are available for entering manure on analysis records.

b. Do you measure manure or effluent from storage in units of tons, thousands of gallons or acre-inches? Select the units of measure for nutrient concentration and application rate by clicking on the arrow button to the right of Column E to display possible options.

c. Annual quantity of P managed (Column I). This is the value:

- (1) determined by using spreadsheet “#2-Nutrient Inventory” on the “Store Loss” page (use the total P_2O_5 retained after losses; cell I24) or
- (2) calculated by using *Tables 1 and 3* below.

Table 1. Calculation of annual quantity of phosphorus managed for meat producing animals (Part A) and all other animals (Part B).

Part A. Meat Producing Animals	A. P_2O_5 Excretion (lbs per finished animal)	B. Number of Finished Animals per Year	C. P_2O_5 Excretion per Year (A x B)	D. Facility P_2O_5 Retention Factor (<i>Table 2</i>)	E. Quantity of P_2O_5 Managed (lbs P_2O_5 /year) (C x D)
Example: 1,000 head cattle feedlot (0.4% P ration) on open lot					
Feedlot solids	23	8,300 head	23 x 8,300 = 190,900	0.95	181,000
Basin solids				0.025	5,000 lbs P_2O_5/year
Enter 181,000 lbs P_2O_5/year and 5,000 lbs P_2O_5/year in Column I of “List of Facilities from which Manure is Collected” of spreadsheet					
Beef - Finishing cattle ¹					
0.3% P in Cattle Ration	16				
0.4% P in Cattle Ration	23				
0.5% P in Cattle Ration	30				
Poultry – Broiler ²	0.080				
Poultry - Turkey (male) ²	0.82				
Poultry - Turkey (females) ²	0.37				
Poultry - Duck ²	0.11				
Swine - Nursery pig ²	0.34				
Swine - Grow-finish ²	3.9				

¹0.3% P in cattle ration would represent a corn-based ration with minimal mineral phosphorus. A 0.4% P and a 0.5% P cattle ration would be typical of a ration that includes 20% and 40% distillers grains, respectively, on a dry basis.

²If phytase is added to the ration of a non-ruminant animal and mineral phosphorus additions are reduced to recommended levels, the P_2O_5 excretion value in Column A can be reduced by approximately 30%.

Part B. All Other Animals	A. P ₂ O ₅ Excretion (lbs per animal per day)	B. Average Number of Animals	C. Fraction of Year Manure Collected	D. P ₂ O ₅ Excretion per Year (A x B x C x 365)	E. Facility P ₂ O ₅ Retention Factor (Table 2)	F. Quantity of P ₂ O ₅ Managed (lbs P ₂ O ₅ /year) (D x E)
Example: Dairy—500 lactating cows, 88 lb milk/day, in freestall barn with slurry storage						71,000 lbs P₂O₅/year
	0.39	500 hd	1.0	0.39 x 500 x 1.0 x 365 = 71,000	1.0	
Enter 71,000 lbs P₂O₅/year in Column I of "List of Facilities from which Manure is Collected" of spreadsheet						
Beef - Cow	0.22					
Beef - Growing Calf	0.13					
Dairy - Lactating cow						
100 lbs milk per day	0.45					
88 lbs milk per day	0.39					
70 lbs milk per day	0.32					
50 lbs milk per day	0.29					
Dairy - Dry cow	0.15					
Dairy - Heifer	0.10					
Horse - Sedentary	0.066					
Horse - Intense exercise	0.17					
Layer ¹	0.0025					
Swine - Gestating sow ¹	0.046					
Swine - Lactating sow ¹	0.13					
Swine - Boar ¹	0.048					

¹If phytase is added to the ration of a non-ruminant animal and mineral phosphorus additions are reduced to recommended levels, then the P₂O₅ excretion value in Column A can be reduced by approximately 30%.

Table 2. Phosphorus retention factor for different animal housing and manure storage facilities.

<i>Manure Storage or Treatment System</i>	<i>P₂O₅ Retention Factor</i>	<i>Manure Storage or Treatment System</i>	<i>P₂O₅ Retention Factor</i>
1. Feedlot – Scraped solids from feedlot surface	0.95	8. Liquid/slurry storage (well agitated)	1.0
2. Feedlot – Solids from settling basin	0.025	9. Storage (pit beneath slatted floor-well agitated)	1.0
3. Feedlot – Liquids from holding pond	0.025		
4. Manure pack under roof	1.0	10. Poultry manure stored in pit beneath slatted floor	1.0
5. Hoop barn bedded pack	1.0		
6. Solid/semi-solid manure and bedding held in roofed storage	1.0	11. Poultry manure on shavings or sawdust held in housing	1.0
		12. Compost	0.95
7. Solid/semi-solid manure and bedding held in unroofed storage	0.95	13. Anaerobic lagoon – liquids	0.35
		14. Anaerobic lagoon – settled solids	0.65

Form 2. Entry Form for New Manure Sample. To enter new manure sample results, you may clear the entry form by clicking on “Clear Form 2.” For all new manure analyses, enter the following:

- a. Date of analysis (Cell D36).
- b. Source of manure (Cell D39) by clicking on the small arrow button to the right of the cell and clicking on the most appropriate choice.
- c. (Optional) Sample ID (Cell D41) used by either the producer or laboratory who did the analysis.
- d. Unit of measure used by the laboratory (Cell D43) by clicking on the most appropriate choice provided after clicking on the arrow button to the right of the cell.
- e. Total organic nitrogen concentration (Cell I37).

- f. Total ammonium nitrogen concentration (Cell I38).
- g. Total phosphorus concentration (Cell I42).
- h. Whether the total phosphorus concentration is measured as elemental P or P_2O_5 by clicking on the appropriate circle next to the choice. If selected, the circle should have a black dot inside of it.
- i. Moisture concentration as percent moisture (Cell I46) OR percent dry matter (Cell I47).
- j. After reviewing the manure analysis information, enter this data into the permanent log by clicking on the “Log Manure Analysis Into Summary” button below *Form 2*. *This information does not become a part of the permanent record until this step is completed.*

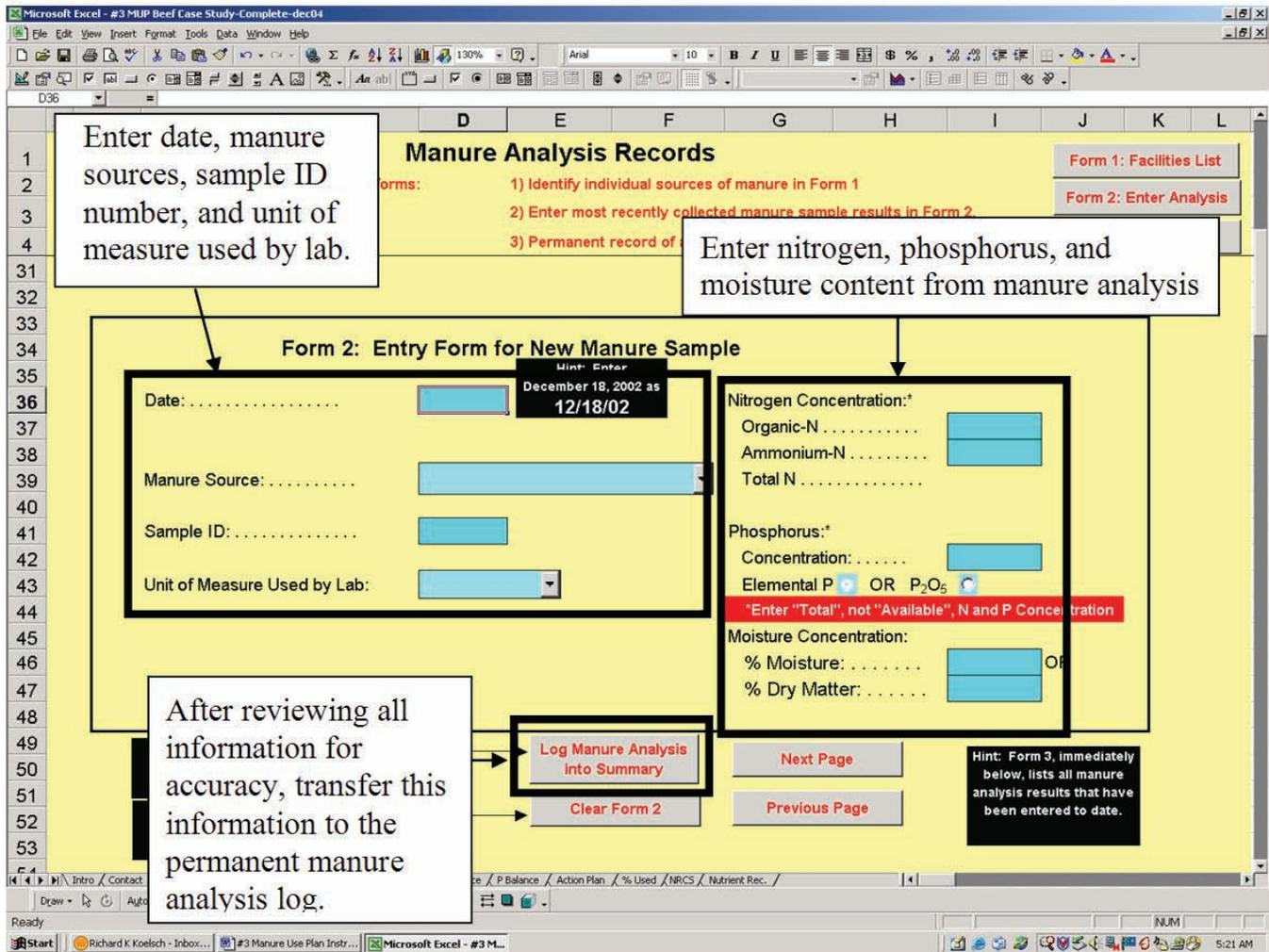


Figure 10. Enter results of manure analyses. This is a temporary location for recording a manure analysis.

4. **Form 3. Log of Past Manure Analysis.** This table reports all manure analyses entered via *Form 2*. To print this table, first click on the “Setup Printout” button and wait patiently for the print out settings to be entered for this table. Then, click on the “Print Analysis Log” button.
5. Past manure analysis records can be deleted by clicking on the “Delete Last Entry” or “Delete Any Entry” buttons.
6. Past manure sample records can be edited as follows:
 - a. The light blue cells for “Sample Date,” “Sample ID,” and “Nutrient and Moisture Concentration” can be edited by clicking on the incorrect value and retyping that value.
 - b. All entries can be edited by clicking on “Edit Last Entry” of “Edit Any Entry” buttons and following the on-screen directions.
7. After checking the information entered, you are ready to move to the next worksheet. Click on either the “Appl. Option” tab or the “Next Page” button.

Form 3: Log of Past Manure Analysis

Sample Date	Manure Source	Sample ID	Unit of Measure		Lab Sample Reported Concentration				%	% Dry
			Lab Sample	Your Preference	Organic-N	Ammonium-N	Total-N	P ₂ O ₅	Moisture	Matter
09/28/02	Beef - Holding Pond - Solids	103	lbs /ton	lbs /ton	6.1	0.9	7	10.5		68.0%
03/28/02	Beef - Holding Pond - Solids	72	lbs /ton	lbs /ton	9.3	1.2	11.3	16.3		80.4%
08/12/02	Beef - Open Lot - Solid Manure	24	lbs /ton	lbs /ton	18.4	1.3	19.7	22.5		70.5%
03/28/02	Beef - Open Lot - Solid Manure	13	lbs /ton	lbs /ton	12.5	4.4	16.9	15.3		35.5%
03/28/02	Beef - Holding Pond - Liquid	12	lbs /acre-inch	lbs /acre-inch	1.2	74.5	75.7	14.5		0.3%
07/30/01	Beef - Open Lot - Solid Manure	4	lbs /ton	lbs /ton	14.8	2.4	17.2	20.2		47.2%
03/17/01	Beef - Holding Pond - Liquid	2	lbs /acre-inch	lbs /acre-inch	0.2	79.6	79.8			

Buttons: Delete Last Entry, Delete Any Entry, Edit Last Entry, Edit Any Entry, Next Page, Setup Printout, Previous Page, Print Analysis Log.

Form 1: Facilities List, Form 2: Enter Analysis, Form 3: Review Log.

Instructions:

- Delete any past manure analysis by clicking on “Delete” buttons and following instructions.
- Edit yellow cells by clicking on “Edit” buttons and following instructions.
- Edit aqua cells by clicking on incorrect cell and entering correct value.

Figure 11. Review and edit this permanent record of manure analyses.

Example¹

A feedlot has three sources from which manure and runoff water are collected: an open lot where solid manure is harvested, a holding pond from which runoff is pumped and a settling basin from which solids are removed. Our “best guess” of phosphorus contained in three nutrient sources is taken from *Table #1*. Information that may be entered in *Form 1* in the *Manure Analysis* worksheet includes:

Manure Source:	Beef - Open Lot - Solid Manure
Units for Nutrient Conc. And App. Rate:	lbs/ton tons/acre
Annual Quantity of P Managed:	181,000

Manure Source:	Beef — Holding Pond — Liquid
Units for Nutrient Conc. And App. Rate:	lbs/acre-inch acre-inch/acre
Annual Quantity of P Managed:	5,000

Manure Source:	Beef — Holding Pond — Solids
Units for Nutrient Conc. And App. Rate:	lbs/ton tons/acre
Annual Quantity of P Managed:	5,000

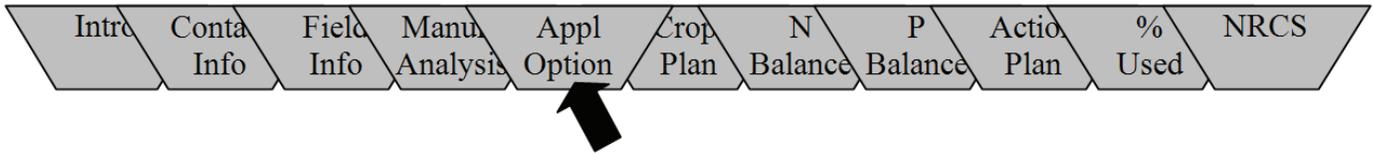
On May 23, 2002, a manure sample for holding pond effluent is received. The results were reported in pounds per acre-inch. Complete *Form 2* for this new manure sample and then permanently store the results into *Form 3*:

Date:	5/23/02
Manure Source:	Beef — Holding Pond — Liquid
Sample ID:	None
Unit of Measure Used by Lab:	lbs/acre-inch
Organic-N:	9
Ammonium-N:	75
Phosphorus Concentration:	37
Elemental P or P₂O₅:	click on P₂O₅
% Moisture:	99.5

To make this manure sample report part of the permanent record, click on the “Log Manure Analysis into Summary” button to enter the sample into *Form 3*. Click on *Form 3* to view, edit past reports, delete past reports, and print all stored manure analysis information.

¹See the previous printouts of the *Manure Analysis* worksheet with the example information entered into the highlighted cells.

Manure Nutrient Availability Calculator Worksheet Instructions



Purpose

This worksheet should identify all commonly used manure application options, including the manure application rates and timing of manure incorporation. For each application option identified, the software will estimate the availability of manure nutrients.

The user should enter any possible rate/timing combination that could potentially be used. These application options (and their associated available nutrients) will be used later to select an appropriate option that best matches the nutrient requirements of an individual field.

Instructions

1. For each possible manure application rate and timing of manure incorporation, identify the:
 - a. Manure sources by clicking on the arrow button to the right of Column C and then selecting the most appropriate choice from the list provided.
 - b. Application and incorporation method used by clicking on the arrow button to the right of Column D and then selecting the most appropriate choice from the list provided.

Option #	Manure Source: Facility in Which Manure is Collected or Stored	Application Method/ Incorporation	Manure application Rate Units	Application Equipment Settings	Select Preferred Manure Analysis Summary	N Content (lb/unit)	Crop Available Factor	Available N (lbs/acre)	N Content (lb/unit)	Crop Availat (lb/unit)	Organ Availat (lb/unit)
EX 1	Swine - Containment Barn & Deep Pit - Slur	Preplant / Immediate	4.0 ,000 gal/ac	3 rd gear, 2000 rpm	Avg - All Samples	25	0.95	95	20	0.35	0.35
EX 2	Swine - Containment Barn & Deep Pit - Slur	Preplant / No incorporation	6.0 ,000 gal/ac	5th gear, 2000 rpm	Avg - All Samples	29	0.35	61	18	0.35	0.35
A	Beef - Open Lot - Solid Manure	Preplant / No incorporation	40.0 tons/ac	5th gear, 2200 rpm	Avg - All Samples	3	0.00	0	15	0.25	0.25
B	Beef - Open Lot - Solid Manure	Preplant / No incorporation	28.0 tons/ac	6th gear, 2200 rpm	Avg - All Samples	3	0.00	0	15	0.25	0.25
C	Beef - Open Lot - Solid Manure	Preplant / No incorporation	20.0 tons/ac	8th gear, 1800 rpm	Avg - All Samples	3	0.00	0	15	0.25	0.25
D	Beef - Open Lot - Solid Manure	Preplant / 1 day	28.0 tons/ac	6th gear, 2200 rpm	Avg - summer samples	2	0.50	26	17	0.25	0.25
E	Beef - Open Lot - Solid Manure	Preplant / 1 day	20.0 tons/ac	8th gear, 1800 rpm	Avg - summer samples	2	0.50	19	17	0.25	0.25
F											
G											
H	Beef - Holding Pond - Liquid	Sprinker Irrigation	1.0 ac-in/ac								
I	Beef - Holding Pond - Liquid	Sprinker Irrigation	2.0 ac-in/ac								
J	Beef - Holding Pond - Liquid	Sprinker Irrigation	3.0 ac-in/ac								
K											
L	Beef - Holding Pond - Solids	Preplant / No incorporation	10.0 tons/ac								
M	Beef - Holding Pond - Solids	Preplant / No incorporation	20.0 tons/ac								
N											
O											

For all possible manure application options

Enter:

1. Manure source	Column C
2. Application method/incorporation	D
3. Application rate and units	E & F
4. Equipment setting to achieve desired rate	G
5. Manure samples representative of manure applied	H

Figure 12. This worksheet helps the user identify all possible manure application options and the availability of manure nutrients.

- c. Manure application rate (Column E).
- d. Units used in application rate by clicking on the arrow button to the right of Column F and selecting the most appropriate choice from the list provided.
- e. Application equipment settings (Column G). This will serve as a reference for the equipment operator as to the equipment settings necessary to achieve the desired application rate. For a tractor-pulled or truck-mounted spreader, indicate gear, engine RPM, PTO or hydraulic settings, and spreader settings. For a pivot, indicate percent speed, pounds per square inch or gallons per minute and fresh water dilution rate.
- f. Preferred manure analysis summary to be used in calculations (Column H) by clicking on the most appropriate choice from the list provided after clicking on the arrow button to the right of the column. If no manure samples have been entered for the manure source entered in

Column C, select "Book Value" and the table will use a default value.

2. When all entries have been completed, this worksheet will summarize the appropriate manure samples and display the manure nutrient concentration (ammonium-N, organic-N and total phosphorus), estimate and display an availability factor for ammonium- and organic-N (first year availability factor for P is assumed to always be 70 percent), and calculate a crop available nutrient application rate for all three nutrients. Review these estimates for accuracy. These estimates will be used later in estimating a nutrient balance for individual fields.
3. After reviewing the information, this table may be printed. First, enter the desired print out settings for the table by clicking on the "Setup Printout" button. Then, click on the "Print Calculator" button.
4. You are ready to move to the next worksheet. Click on the "Crop Plan" tab or the "Next Page" button.

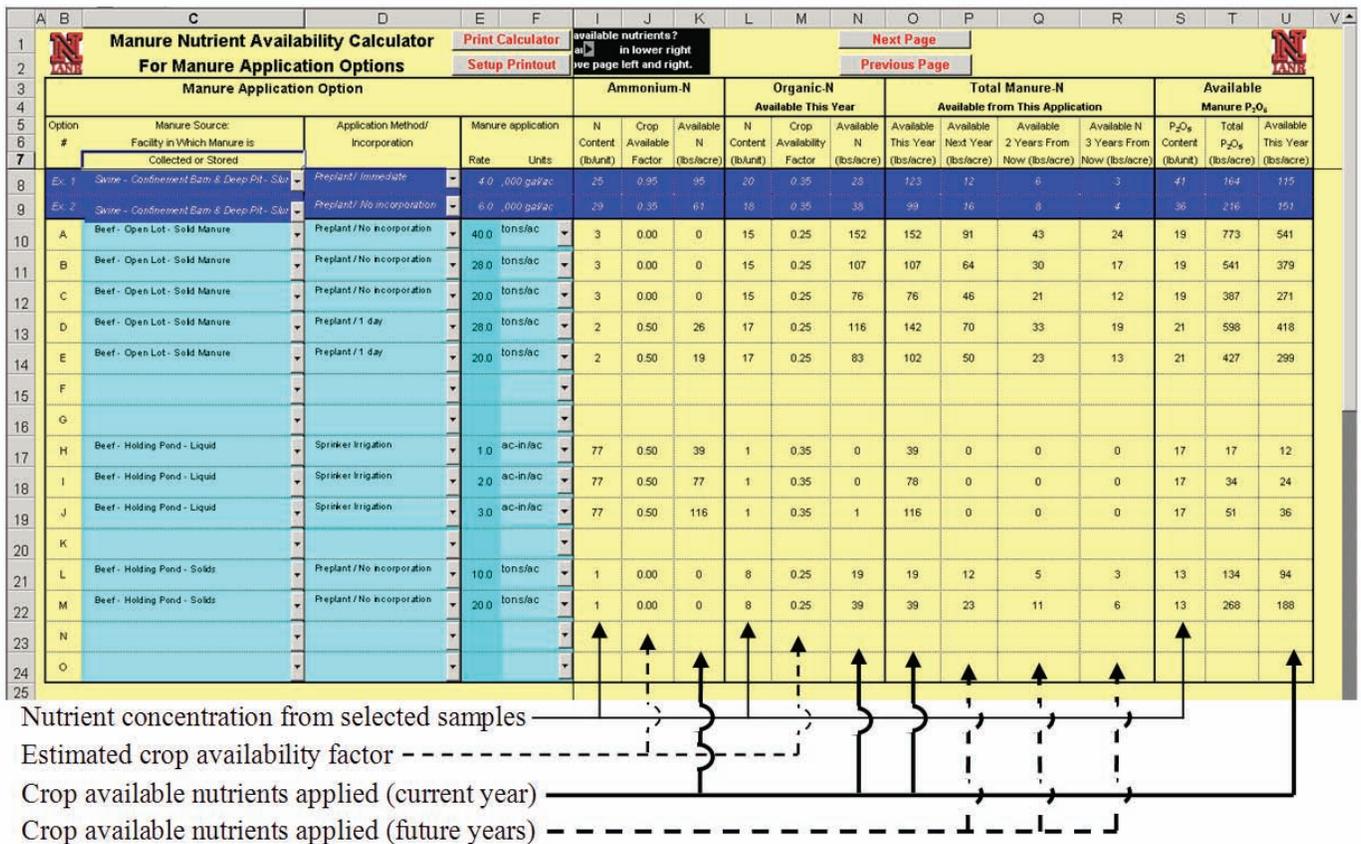


Figure 13. This worksheet will calculate a crop available nutrient application rate for ammonium-N, organic-N and total phosphorus.

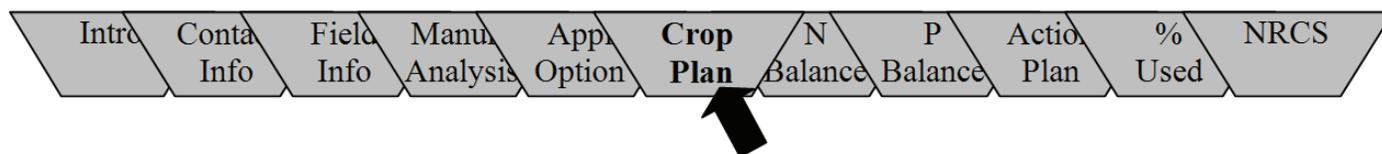
Example

Mr. Farmer wishes to add a sixth manure application option closer to a P-based application. Enter the following information as Option F in the *Appl. Option* worksheet:

Facility:	Beef – Open Lot – Solid Manure
Application Method / Incorporation:	Preplant/No incorporation
Application Rate:	12
Application Rate Units:	tons/acre
Application Equipment Settings:	6th gear, 2200 RPM, slow spreader setting
Preferred Manure Analysis Summary:	Avg. – All Samples

Entry Form For An Individual Field's Cropping Plan

Worksheet Instructions



Purpose

This worksheet allows entry of the necessary information for a cropping and nutrient application plan. All individual field plans are entered through this form and then transferred to a permanent record in the *N and P Balance* worksheets.

Warning:

Nutrient and cropping plans can only be entered and updated for the *current calendar year and the next five years*. Past year plans cannot be entered or updated.

Instructions

1. To clear the entry form, click on the “Clear Entry Form” button below the form.
2. Prior to the cropping season, a nutrient plan should be developed for each field. This form is used to enter the important cropping and nutrient application plans. For each field or management unit, fill out a new form and then transfer this information to a permanent record in the *N and P Balance Worksheets*. Enter the following information for each field or management unit:
 - a. Field or management unit name (cell D4). Click on “Down” arrow button to select from the fields previously entered in the *Field Info* worksheet.
 - b. Cropping season year (cell D5).
 - c. Planned crop for the current season year (cell D8) by clicking on the most appropriate choice from the list provided after clicking on the arrow button to the right of the cell.
 - d. Yield goal for the planned crop in the units shown after selecting the crop (cell D9). Yield goal is typically calculated as 1.05 X average yield of past five years.
 - e. Crop nitrogen recommendation in pounds of N per acre (cell D12). See instruction “o” for UNL recommendations.
 - f. Crop phosphorus recommendation in pounds of P_2O_5 per acre (cell D13). See instruction “o” below for UNL recommendations.
 - g. Irrigation water applied in inches (cell D16).
 - h. Nitrate nitrogen concentration of irrigation water in ppm (cell D17).
 - i. Fertilizer type and rate. Up to three fertilizers may be entered by:
 - Selecting fertilizer name/type (cells K5 and K7) by clicking on the arrow button to the right of the cell and selecting the most appropriate choice from the list provided and then entering application rate in cell K6 and K8 in pounds of total product per acre.
 - Entering N- P_2O_5 - K_2O (cells K9, M9, O9) if a fertilizer mix is used. Enter application rate in pounds of total product per acre (cell K10).
 - m. Current year’s Manure Application Option (cell K12) by selecting a manure application option previously entered in the *Application Option* worksheet.
 - n. If a legume was grown on this field in the previous cropping season (cell J16), select the appropriate legume from the list provided after clicking on the arrow button to the right of the cell.
 - o. To determine the UNL Crop Nutrient Recommendations for the crop indicated, enter the correct information requested to the left of the light blue cells. A recommended rate will be indicated below the light blue cells in pounds of nutrient per acre. If one chooses to use this recommended value, these values will need to be re-entered in cells D12 and D13.
 - p. After carefully checking the information for accuracy, transfer this information to a permanent record in the *N and P Balance* worksheets by clicking the “Transfer To N & P Balance” button above or below the form.

2. Enter field name, year, planned crop, yield goal, nutrient recommendations, and irrigation information for nitrate credit.

3. Enter fertilizer types and rates, manure application option, and legume credit.

4. UNL crop nutrient recommendations can be estimated in this section. If you chose to use these recommendations, the recommended rate must be entered again in cells D12 and D13.

5. After reviewing all entries for accuracy, transfer this information to a permanent record in the N & P Balance worksheets by clicking on this button.

1. Start with a blank entry form by clicking on the "Clear Entry Form" button

Figure 14. Enter and review crop and nutrient management information for individual cells. This is a temporary record.

- To move to the next worksheet, click on the "N Balance" worksheet tab or the "Next Page" button.

What if I made a mistake?

If a mistake is later observed, you may re-enter the current and all future years' plans at any time. A plan is erased, and the new information is placed in the permanent record. Past years' plans may not be modified.

Many (but not all) of the entries can be modified individually in the *N and P Balance* worksheet. For example, if you choose to use a different manure application option or change a fertilizer application rate, it can be changed quickly in the *N Balance* worksheets.

What if I want to add manure to a field not listed?

Additional fields can be included at any time. You must first go to the *Field Info* worksheet and add the requested information for the desired field. After that information is entered, return to the *Crop Plan* worksheet and enter the required information for this new field.

What if I do not use University of Nebraska–Lincoln nutrient recommendations?

Any fertilizer recommendations may be entered in D12 and D13. University of Nebraska–Lincoln recommendations are simply provided as one option. If your nutrient management plan is for a Nebraska Department of Environmental Quality (NDEQ) permit, a generally accepted nutrient recommendation must be followed. The University of Nebraska–Lincoln nutrient recommendations are one option accepted by NDEQ.

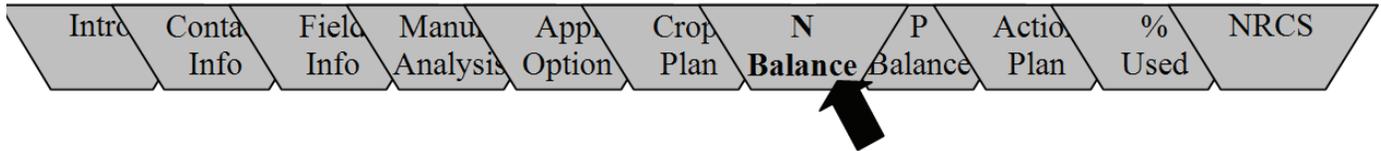
Example

Mr. Farmer always plants corn grain on the pivot for a yield goal of 170 bushels per acre. He applies 100 pounds of urea per acre each year, in addition to a pre-plant manure application (Option B) at 28 tons per acre with no incorporation. Using the University of Nebraska–Lincoln nitrogen and phosphorus recommendations, it is recommended that 139 pounds of nitrogen and 40 pounds of P_2O_5 per acre be applied. Information entered for Pivot field for one year in the *Crop Plan* worksheet includes:

Field or Management Unit:	Pivot
Cropping Season Year:	2005
Planned Crop:	Corn Grain
Yield Goal:	170
Soil Nitrate:	6.0
Soil Organic Matter:	2.20
Crop N Recommendations:	139
P Soil Test Level:	8
Application Method:	1 (Broadcast)
Soil Test:	Bray-P
Crop P Recommendations:	40
Fertilizer Name/Type:	45-0-0...Urea
Fertilizer Application Rate:	100
Manure Application Option:	B. 28 tons/ac, Preplant / No incorporation

After carefully checking the information for accuracy, transfer this information to a permanent record in the *N and P Balances* worksheet by clicking the “Transfer To N & P Balance” button above or below the form.

Nitrogen Balance Calculator Worksheet Instructions



Purpose

This worksheet estimates all nitrogen credits and balances those credits against crop nutrient requirements. Your goal is to identify the appropriate fertilizer and manure application rates that result in a nitrogen balance listed as "OK" in Column AB.

only appear as the current and future years' plans are moved into the past years' records with changes in the computer's clock (advancing of the years).

Permanent Nutrient Plan Record Function

The *N Balance* and *P Balance* worksheets serve as a permanent record of the cropping and nutrient plan for individual fields. An 11-year record is maintained for each field. This record includes the plan for the current year (always the middle year in the 11-year record), plans for the past five years (if entered) and space for plans for the next five years.

The first time this spreadsheet is opened in a new year, this 11-year record is updated automatically. The new year's plan is moved to the middle of the record, matching the year of the computer's clock. At the same time, the oldest year's plan (new year minus six years) is deleted, and space for a future year's plan (new year plus five years) is added.

Only nutrient plans for the current year and the future five years can be entered or updated. Past year plans will

For the example shown below, the current year is 2005. When the computer clock first advances to 2006 and this spreadsheet is opened, an automatic routine erases the record for 2000, moves the year 2006 line to the middle of the record, and adds space for the year 2011. If you wish to maintain records for more than five years into the past, a hard copy will need to be printed.

Crop Nitrogen Balance Calculator for Nebraska										Purpose: Point Here to View		Previous Page		Next Page		Setup Printout		Manure Application Option Letter?		Prime rib ranch	
Year	Planned Crop	Yield Goal	Soil Test N Recom (lbs/ac)	Crop N Removal (lbs/ac)	Water Applied (inches)	Nitrate Content (ppm)	N Credit (lbs/ac)	Describe Legume Grown in Previous Cropping Season	N Credit (lbs./ac)	Fertilizer & Application Rate (lbs. product/ac)	Fertilizer & Application Rate (lbs. product/ac)	Fertilizer & Application Rate (lbs. product/ac)	N Credit (lbs./ac)	Application Option	NH ₄ -N	Organic N	Field Nitrogen Balance				
Ex 1998	Corn Grain	175 bu/ac	160		10	5	11	Soybeans	40	10-34-0	200		20	B		60	37	13 lbs./ac OK			
Ex 1999	Soybeans	56 bu/ac		115	7	5	8							A B		115	56	56 lbs./ac Excess			
* Assumes of nitrogen removed by legume crops is from manure and other soil nitrogen sources (40% from legume fixed nitrogen)																	Hint: Move down to see additional fields.				
Field # 1		Pivot		130 acres		Soil Texture: Medium		Print Field #1													
2000																					
2001																					
2002	Corn Grain	178 bu/ac	160		6	16							82	B			107	50 lbs./ac Excess			
2003	Corn Grain	178 bu/ac	160		6	16							82	B B			171	114 lbs./ac Excess			
2004	Corn Grain	175 bu/ac	160								11-52-00	0	82	C B B			170	121 lbs./ac Excess			
2005	Corn Grain	180 bu/ac	165										0	E C B B	16	175	43 lbs./ac Excess				
2006	Corn Grain	180 bu/ac	165										0	E E C B	16	171	38 lbs./ac Excess				
2007	Corn Grain	180 bu/ac	165		6	12	16			82-0-0	0	0	0	E E E C	16	168	35 lbs./ac Excess				
2008													0	E E E	0	86					
2009													0	E E	0	36					
2010													0	E	0	13					

Figure 15. The worksheet contains permanent records for 11 years: the five previous years, the current year, and the next five years.

It is strongly recommended that a printed copy of each field's record is made each year after adding the next cropping season's plans.

Instructions

- This worksheet permanently records all nitrogen inputs and balances on a field by field basis. Scroll down to view other fields. First, review Column AB to determine whether nutrients are applied at a rate judged to be in “Excess,” “OK” or “Short.” After reviewing this information, you can make changes to balance the N applied to an individual field; however, only the current and future years’ plans can be changed. The following may be altered:
 - Fertilizer application rate (Columns N, P, and R)
 - Manure application option (Column T). Manure application rates for the past three years can be updated to reflect actual application rates that may differ from the planned rates. These changes will not be used to change past year nutrient balances but will be used to correctly estimate the current and future year’s nutrient balances.
- Other cells that can be modified include:
 - Yield goal (Column D)
 - Soil test N recommendation (Column F)
 - Irrigation water applied in inches (Column H)
 - Nitrate content of irrigation water in ppm (Column I)
- You may alter the limits for acceptable manure and fertilizer application rates based on a balance of crop nitrogen requirements and nitrogen credits. The default value is 20 percent. For example, if the worksheet estimates a crop nitrogen requirement of 100 lbs, nitrogen credits totaling 100-120 lbs will be labeled as “OK” in column AB. This assumption for an acceptable range of nitrogen applications may be changed to another value if desired (cell AB6).
- To move to the next worksheet, click on the “P Balance” tab or the “Next Page” button.

Example

After viewing his N balance, Joe Farmer notices he has been applying an excess of 43 pounds of N per acre to his Field #1 in 2005. He can change his fertilizer application rate or manure application option at this time to reduce the N imbalance. One option would be to use a lower manure application rate.

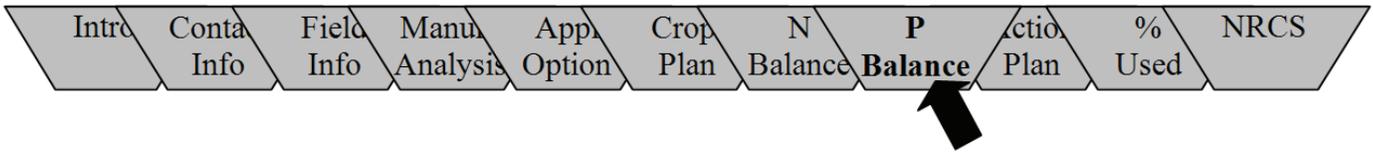
Crop Nitrogen Balance Calculator for Nebraska													Purpose: Point Here to View		Previous Page		Next Page		Setup Printout		Manure Application Option Letter?									
Field Specific Information			N Requirement		Irrigation N Credit			Legume Nitrogen Credit		Nitrogen Fertilizer Credit			Manure Nitrogen Credit			Field Nitrogen Balance														
Year	Planned Crop	Yield Goal	Soil Test N Recon. (lbs/ac)	Crop N Removal* (lbs/ac)	Water Applied (inches)	Nitrate Content (ppm)	N Credit (lbs/ac)	Describe Legume Grown in Previous Cropping Season	N Credit (lbs./ac)	Fertilizer & Application Rate (lbs. product/ac)	Fertilizer & Application Rate (lbs. product/ac)	Fertilizer & Application Rate (lbs. product/ac)	N Credit (lbs./ac)	Application Option	NH ₄ -N Credit (lbs./ac)	Organic N Credit (lbs./ac)	(+ Balance... Excess N, - Balance... Short on N) Allowed? +0 to 20%													
Ex. 1998	Corn Grain	175 bu/ac	160		10	5	11	Soybeans	40	10-34-0	200																			
Ex. 1999	Soybeans	55 bu/ac	115		7	5	8																							
* Assumes of nitrogen removed by legume crops is from manure and other soil nitrogen sources (40% from legume fixed nitrogen).																														
Field # 1			Pivot		130 acres			Soil Texture: Medium																						
2000							0		0	0	0	0	0																	
2001							0		0	0	0	0	0																	
2002	Corn Grain	178 bu/ac	160		6	16	22			82-0-0	100	0	0	82	B		0	107	50 lbs./ac Excess											
2003	Corn Grain	178 bu/ac	160		6	16	22			82-0-0	100	0	0	82	B	B		171	114 lbs./ac Excess											
2004	Corn Grain	175 bu/ac	160		8	16	29			82-0-0	100	0	11-52-00	0	82	C	B	B	0	170	121 lbs./ac Excess									
2005	Corn Grain	180 bu/ac	165		6	12	16			82-0-0	0	0	0	0	E		B	B	16	175	43 lbs./ac Excess									
2006	Corn Grain	180 bu/ac	165		6	12	16			82-0-0	0	0	0	0	E		E	C	B	16	171	38 lbs./ac Excess								
2007	Corn Grain	180 bu/ac	165		6	12	16			82-0-0	0	0	0	0	E		E	C	B	16	168	35 lbs./ac Excess								
2008										0	0	0	0				E	E	E	0	86									
2009										0	0	0	0				E	E	E	0	36									
2010										0	0	0	0				E	E	E	0	13									

1. The nitrogen balance is shown here. Your goal is to create a balance listed as “OK”.

2. You may adjust the nitrogen balance by changing fertilizer and manure application rates.

Figure 16. This worksheet permanently records all nitrogen inputs and balances for one field. Additional field N balances will be found below Field 1.

Phosphorus Balance Calculator Worksheet Instructions



Purpose

This worksheet estimates all phosphorus credits and balances those credits against crop requirements. The goal is to identify appropriate fertilizer and manure application rates that result in a phosphorus balance with crop requirements over a three- to five-year period. This worksheet serves a similar function as the *N Balance* worksheet. It is the phosphorus component of a permanent nutrient and cropping management record (see *Permanent Nutrient Management Record Function* discussion on page 23).

Instructions

1. This worksheet records all phosphorus inputs and balances on a field by field basis. After reviewing each entry, changes can be made to balance the P for each field. If, after reviewing the P_2O_5 balance, a different fertilizer or manure application rate is desired, return to "N Balance" page and make appropriate changes. Soil test P recommendations (Column F) may be altered on this worksheet; all other alterations must be done on the *N Balance* worksheet.

Example

After viewing his P balance, Joe Farmer notices he has been applying excess P_2O_5 to his Field #1 in past years. To reduce the buildup of P in this field, Joe may want to eliminate manure applications in 2006 and 2007 to this field and monitor soil test P levels. The implication of this decision is that an additional field(s) will need to be identified for future manure application. Return to the *N Balance* worksheet to eliminate manure applications in 2006 and 2007.

Crop Phosphorus Balance Calculator		Purpose: Point Here to View		Previous Page		Next Page		Setup Printout		Prime rib ranch				
Year	Planned Crop	Average Yield for Past 5 Cropping Seasons	Soil Test P_2O_5 Recom. (lbs/ac)	Crop P_2O_5 Removal (lbs/ac)	Fertilizer & Application Rate (lbs. product/ac)	Fertilizer & Application Rate (lbs. product/ac)	Fertilizer & Application Rate (lbs. product/ac)	P Credit (lbs. P_2O_5 /acre)	Manure Application Option	Total P_2O_5 Applied (lbs/ac)	Available P_2O_5 for Current Yr. (lbs/ac)	Current Year P_2O_5 Balance (current year available P only)	Crop-Yrs. to use total P_2O_5 applied	
Ex. 1998	Corn Grain	175 bu/ac	60		10-34-0 200			68	B	216	151	91 lbs/ac Excess	4	
1999				43					A	164	114	71 lbs/ac Excess	4	
Fertilizer Rates and Manure Application Option must be changed in "N Balance" Worksheet														
Field #1					Pivot 130 acres					Print Field #1				
2003	Corn Grain	178 bu/ac		55	82-0-0 100			0	B	542	379	325 lbs/ac Excess	10	
2004	Corn Grain	175 bu/ac		54	82-0-0 100			0	B	542	379	325 lbs/ac Excess	10	
2005	Corn Grain	180 bu/ac		55	82-0-0 0			0	E	423	296	240 lbs/ac Excess	8	
2006	Corn Grain	180 bu/ac		55	82-0-0 0			0	E	423	296	240 lbs/ac Excess	8	
2007	Corn Grain	180 bu/ac		55	82-0-0 0			0	E	423	296	240 lbs/ac Excess	8	
2008								0		0	0			
2009								0		0	0			
2010								0		0	0			

Only the P_2O_5 recommendation can be changed in the P Balance worksheet.

If the P_2O_5 recommendation (column F) is left blank, a crop removal rate for P_2O_5 is estimated for use in P Balance calculations.

Changes to fertilizer and manure application rates must be made in the N Balance worksheet.

Figure 17. This worksheet estimates all phosphorus credits and balances those credits against crop requirements.

2. To move to the next worksheet, click on the “Action Plan” worksheet tab or the “Next Page” button.

How was the crop P requirement determined?

If you entered a recommended rate in the *Crop Plan* worksheet, that rate was entered in this worksheet. If you left the recommended rate blank, an estimate of crop P removal was made based upon yield and estimated phosphorus content of the selected crop.

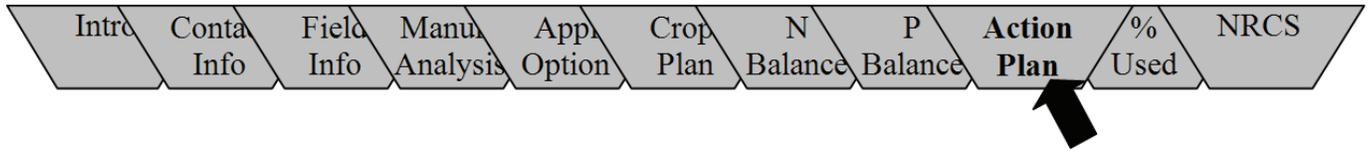
I entered a crop P_2O_5 recommendation in the *Crop Plan* worksheet and would like to substitute the P_2O_5 crop removal rate for estimating a P balance. How can I make this change?

Click on the light blue cell for Soil Test P_2O_5 Recommendation (column “F”) for the field and year that you would prefer to use the crop P removal rate. Press the “DELETE” key and then press “RETURN” to remove any value from this cell in column F. The crop removal rate should now appear in column G and all calculations will be based on this rate.

Warning

The estimate of “Crop Years to Use Total P_2O_5 Applied” (Column T) is only an approximation. Soil P test results are the preferred measure of field P status upon which future agronomic decisions should be made.

Action Plan Worksheet Instructions



Purpose

This worksheet summarizes the preferred manure and fertilizer application rates, preferred timing of manure application, and manure application restrictions for all fields in a single cropping season. This report can be shared with those involved in operating manure and fertilizer application equipment to communicate nutrient application plans.

Instructions

1. This worksheet summarizes the manure and fertilizer application details on a field by field basis for a selected year. To change years, click on cell "V2" and type in the correct year, hit enter.

2. The following may be added to each year's Action Plan:
 - a. Number of hours to incorporate manure into soil (Column G).
 - b. Suggested time of year for manure application (Columns J through U). Place an "x" under the months in which manure application is acceptable.
 - c. Additional application instructions (Column W), such as setback distances.

Manure and Fertilizer Application Plan for 2003 Crop Year																								
Prime rib ranch																								
Manure Application Instructions																								
Field ID	Manure Source	Planned Application Rate	Incorporate Manure into Soil? Hours	Nutrient Rate (lbs/ac)		Suggested Timing of Manure Application												Application Equipment Settings	Setbacks from Surface Water and Additional Application Instructions	Commercial Fertilizer Application				
				N	P ₂ O ₅	J	F	M	A	M	J	J	A	S	O	N	D			Type	Rate lbs/ac	Type	Rate lbs/ac	Type
Example-Home 80	Swine - Confinement & Deep Pit-Slurry	4,000 gal/ac	Preplant / Immediate	0	132	164	x	x									3 rd gear, 2000 rpm	50' setback on Cow Creek	10-34-0	200				
Pivot	Beef - Open Lot - Solid Manure	28 tons/ac	Preplant / No incorporation		171	541											6th gear, 2200 rpm		82-0-0	100				
Feedlot qtr - Effluent Irrigated	Beef - Holding Pond - Liquid	3 ac-in/ac	Sprinkler Irrigation		117	51											3 passes							
Feedlot qtr - No Effluent																								
Dry Quarter	Beef - Open Lot - Solid Manure	20 tons/ac	Preplant / No incorporation		140	387											8th gear, 1800 rpm							
			Preplant / 1 day	4	165	427											8th gear, 1800 rpm							

Select Crop Year for which application plan will be viewed.

Desired timing between manure application and incorporation can be defined here (optional).

Identify preferred time of year for application and restrictions or other instructions.

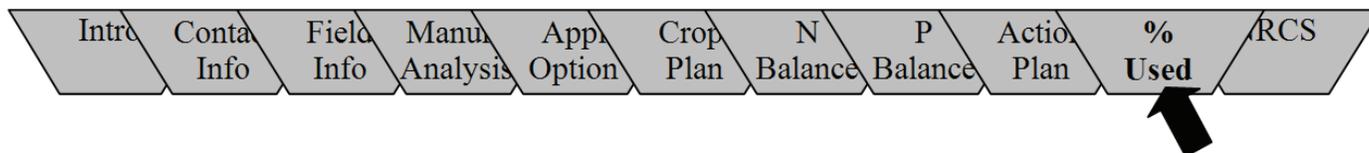
Figure 18. Worksheet summarizing manure and fertilizer application details on a field by field basis for one cropping season.

Example

Joe Farmer chooses to view year 2004 and enters that year in cell V2. He has agreed to incorporate manure the same day it is applied on all neighboring fields receiving manure. Indicate that manure will be incorporated within 8 hours on appropriate fields (Column G). He may select the months he would prefer the manure to be applied to each field (Columns J through U) by placing an x in the months he desires. Any other information he wishes to provide regarding manure application may be included in Column W.

3. After reviewing the Action Plan, this worksheet may be printed by clicking on the “Print” button.
4. You are now ready to move to the next worksheet. Click on the “% Used” worksheet tab or the “Next Page” button.

Portion of Manure Utilized by Cropping Plan Worksheet Instructions



Purpose

This worksheet estimates the amount of manure applied to individual fields for which a nutrient plan has been prepared and compares that to the total estimated manure produced by your farm for a one-year period to produce a calculation of “% of Total Manure Utilized.”

Assumptions

Phosphorus is used as the basis for this calculation with the assumption that phosphorus is conserved. The accuracy of this estimate is dependent upon the accuracy of the estimate of “Annual Phosphorus Managed” for individual manure sources that was entered in the *Manure Analysis* worksheet (cells I10 through I15).

Instructions

1. This worksheet estimates the percent of manure utilized for a one-year period. Enter the year of interest in cell “H3.”
2. If insufficient land application of manure is indicated (less than 100 percent in graph), planner may need to apply manure to additional fields or apply additional manure on existing fields.
3. After reviewing the graph and table, this worksheet may be printed by clicking the “Print” button.

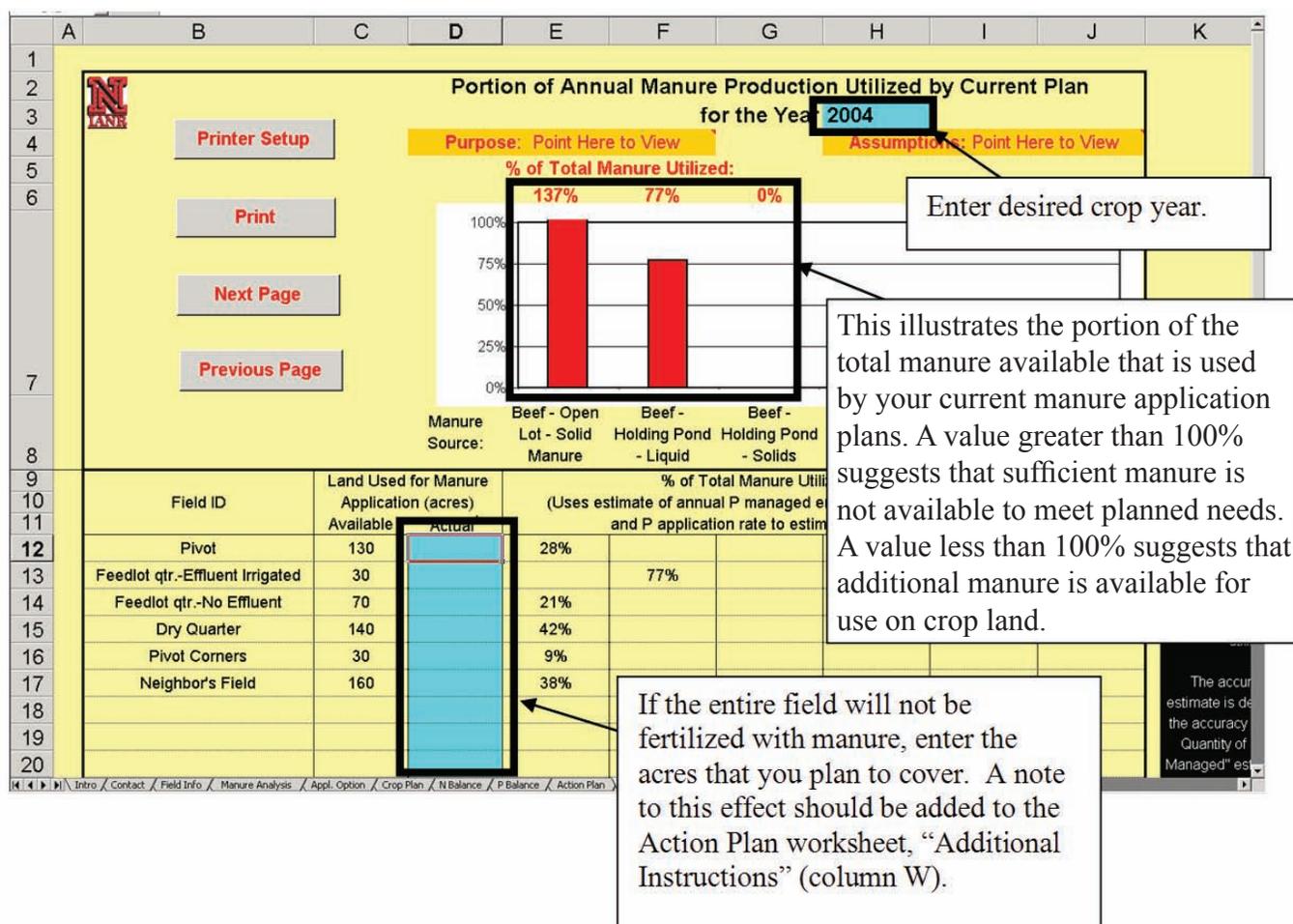


Figure 19. This worksheet estimates the amount of manure applied to individual fields and compares that to estimated annual manure application. The goal is to develop a plan that utilizes approximately 100% of each manure source.

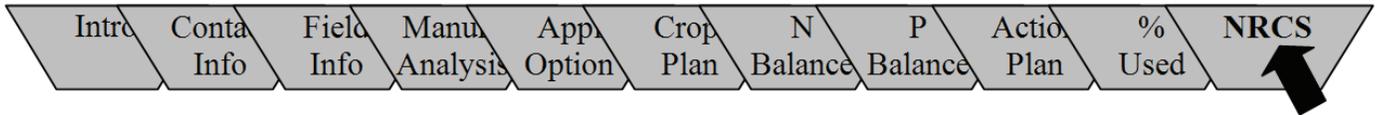
Example

Joe Farmer wants to view the percent of manure utilized in 2004, so he enters that value into cell H3. He notices that the current nutrient management plan should utilize 137 percent of the solid manure, 77 percent of the holding pond liquid, and 0 percent of the holding pond solids. The opportunity exists for reducing solid manure use on some fields and substituting holding pond solids for open lot solid manure. Try the following changes to correct some of the concerns.

1. For Field #6, Neighbor's Field, apply manure to only 100 acres of this field. This can be done by entering 100 in cell D17 of the *% Used* worksheet. A note about this change should be shared with the manure application equipment operator under the *Additional Instructions* column of the *Action Plan* worksheet.
2. For Field #5, Pivot Corners, substitute manure application option M (20 ton/acre application of holding pond solids) for manure application option B (28 ton/acre application of scraped solids from the feedlot). Substitute "M" in cell T76 in place of the current "B" in that same cell in the *N Balance* worksheet.
3. You may want to consider creating a higher holding pond liquid application rate (create a new application rate option in *Appl. Option* worksheet) that could be utilized on Field #2 (Feedlot Quarter-Effluent Irrigated).

Did these changes produce a plan that utilized closer to 100 percent of each manure source?

NRCS "Nutrient Budget Jobsheet" Instructions



Purpose

This worksheet creates an individual field nutrient budget sheet used by USDA Natural Resource Conservation Service for CNMP development.

Instructions

- Many of the entries for this job sheet were completed with information entered previously in the *Manure Use Plan* spreadsheet. That information is transferred to the job sheet.
- Additional information will need to be added by the planner. The light blue cells indicate those items remaining to be completed by the planner.

Nutrient Budget Jobsheet for 2003 Crop Year

Annual Nutrient Budget Jobsheet 12/29/2004

Producer: Joe Farmer Field Name / No.: Pivot

Farm Name: Prime rib ranch Tract No / Crop Acres: 130 ac

Planned Crop: Corn Grain
Previous Crop: Corn Grain
Yield Goal: 178 bu/ac
Actual Yield: bu/ac

SOIL TEST VALUES in lbs./ac. (3 & 4)

	N	P ₂ O ₅	K ₂ O	S	Zn	Fe
Soil Test Values (3 & 4)						
Soil Test Depth (inches)						

RECOMMENDATIONS

CREDITS (lbs./ac.):

Irrigation Water (6): 16

Notes/Recommendations (8)

Proposed Application (10) in lbs. of nutrient/acre

Nutrient Source	Timing	Rate	N	P ₂ O ₅	K ₂ O	S	Zn	Fe	Leaching Potential
Manure		28 tons/ac	107	541					
82-0-0		100 lbs. product/ac	82	0					
		0 lbs. product/ac							
		0 lbs. product/ac							
Total			189	541					

Are nutrient applications within tolerance limits? HI HI

N-Inhibitor used YES NO

NE-T>G> Notice 490, Section IV page # 1 NRCS-January 2002

Field 1 Hint: The Nutrient Budget Jobsheet is commonly used by NRCS staff to provide an annual summary of the management plan for an individual field.

Fields are laid out vertically in numeric order

Setup Printout
Print Field #1
Clear Field #1
Previous Page

A leaching index potential can be estimated by entering application timing. Soil texture is also factored into leaching potential.

Nutrient Source Application Timing

Manure [Dropdown]

82-0-0 [Dropdown]

Nutrient Application Limits

Excess N Allowed? (To change, see N Balance, cell AB6) Yrs. Of P Application Allowed in Single Year

20% 5

Fields 2-25

Data previously entered in Manure Use Plan spreadsheet is copied to this Nutrient Budget Jobsheet.

Information requested by aqua colored cells must be entered for the first time.

Figure 20. Nutrient budget for individual fields, as required for development of a Crop Nutrient Management Plan (CNMP).