Nebraska's Comprehensive Nutrient Management Planning Process

Nebraska CNMP program is funded by grants from
USDA CSREES and Nebraska Environmental Trust Fund

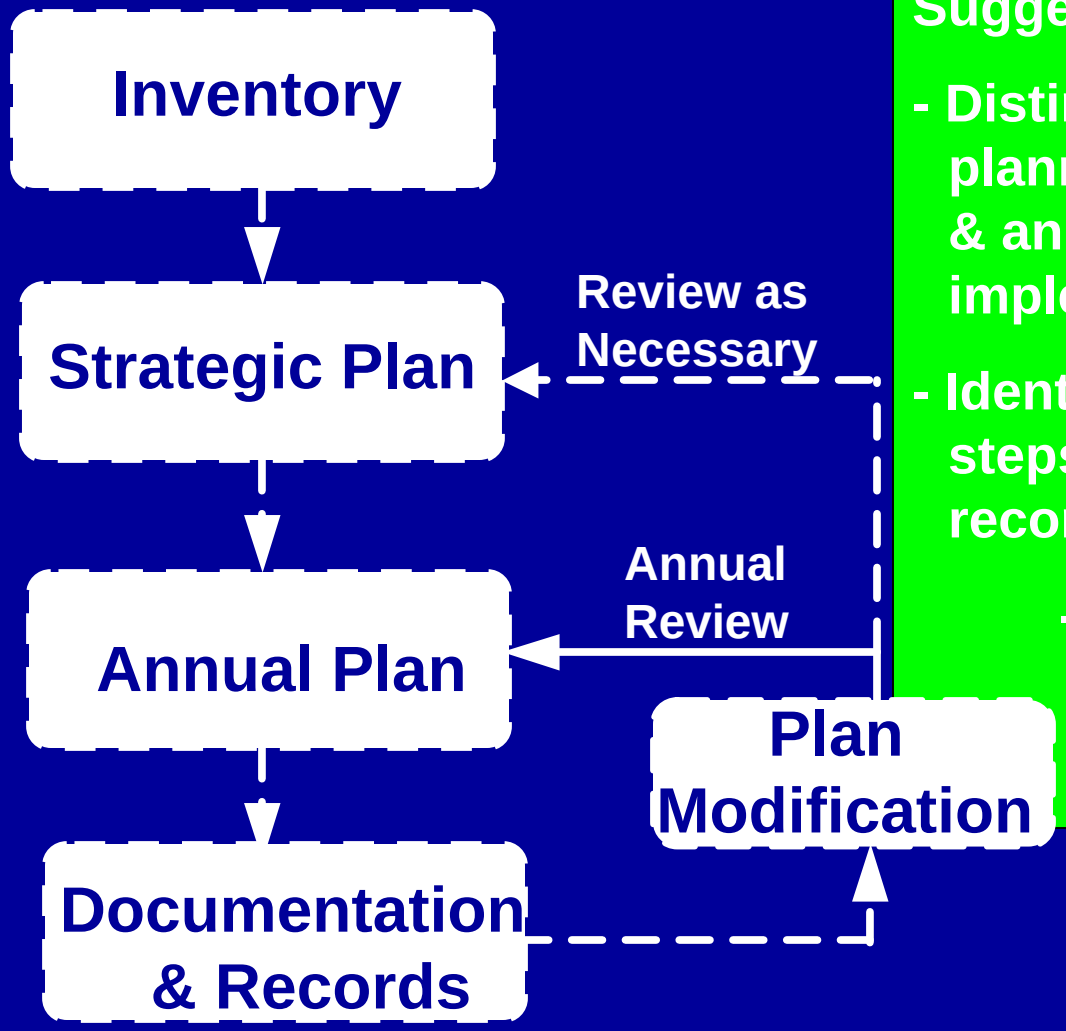
NE CNMP Objectives

- Develop “Consensus” CNMP for use in Nebraska.
- Pilot test the NE CNMP tools with producers and advisors.
- Develop infrastructure for statewide CNMP implementation.

Objective 1: "Consensus" CNMP

- Stakeholder workgroup meetings (1999):
  - Defined CNMP as a five step process.
  - Recommended limited scope to regulatory issues.
  - Identified key tools necessary to assist producer in implementing CNMP.
  - Reviewed university developed drafts.

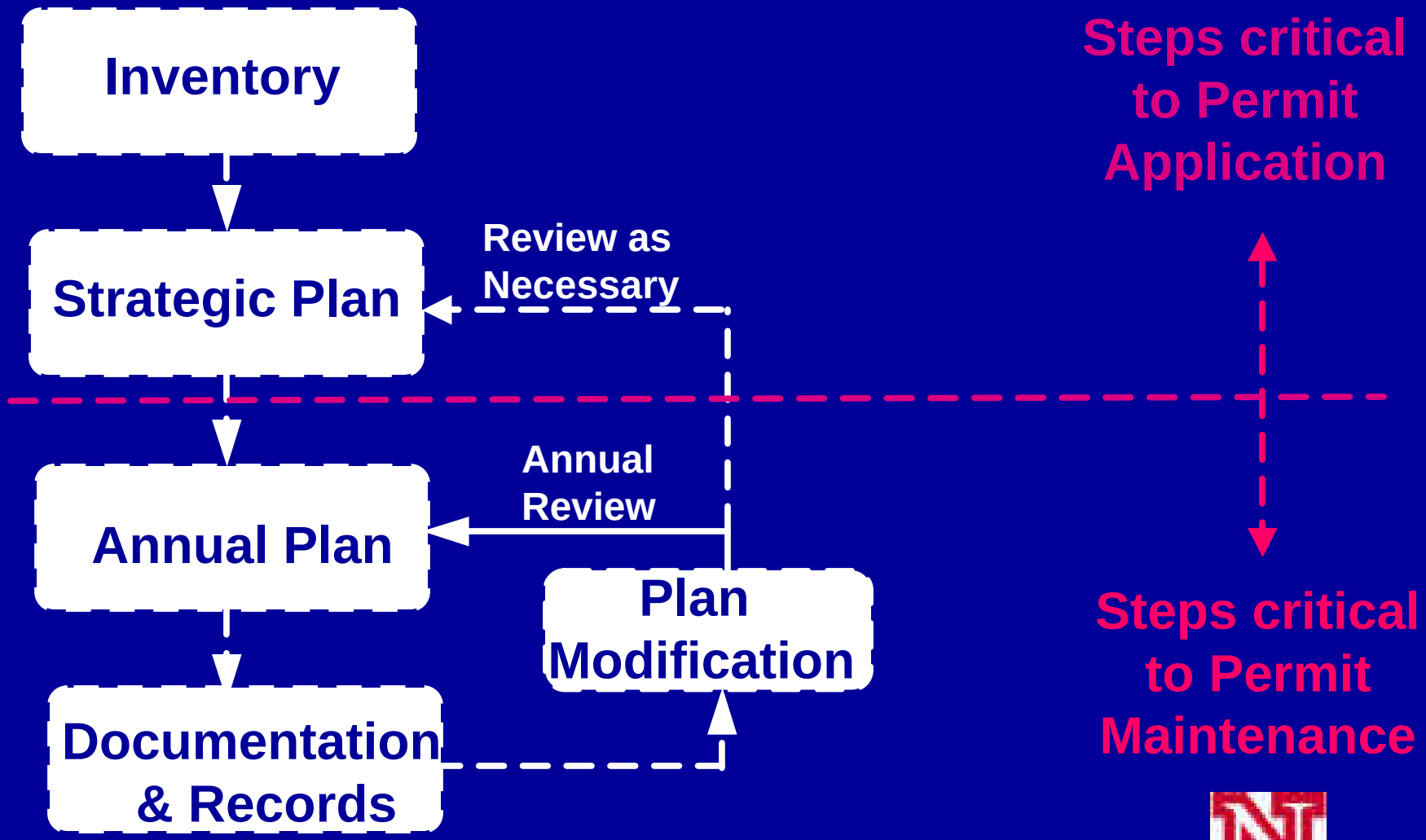
Objective 1: "Consensus" CNMP



Suggest 5 steps to:

- Distinguish between strategic planning for permit application & annual planning for permit implementation
- Identify key implementation steps (annual planning & recording keeping)
- Recognize importance of continual revision & improvement to plan

Objective 1: "Consensus" CNMP



NE CNMP Tools

- Land Application workbook
  - Nutrient inventory spreadsheet
  - Manure use planner spreadsheet
- Manure Storage workbook
  - Staff gauge critical levels spreadsheet (under development)
- Odor Management workbook
- Whole Farm Nutrient Balance (Lesson 2)
  - WFNB Spreadsheet

Workbook Example - Mapping

Workbooks provide instructions & sample forms

Form 4. Land Application Sites for Manure Application (Form 4, part 2).

Field Map of Current Conservation Practices: For each land application site, complete a scaled drawing or attach an aerial photograph (e.g. soils map, USGS Topographic map or USDA FSA aerial photo) showing field location. The following items should be clearly marked on each field:

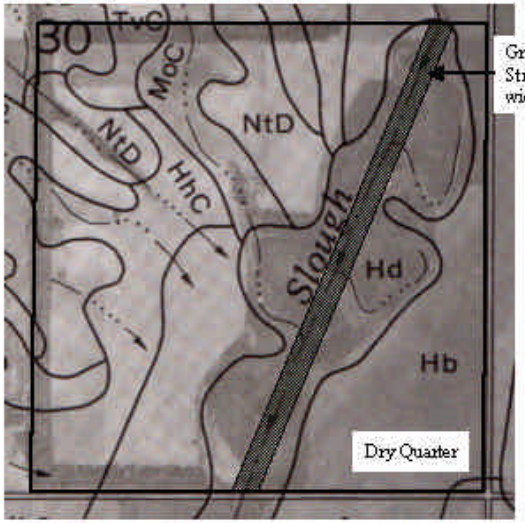
Legend

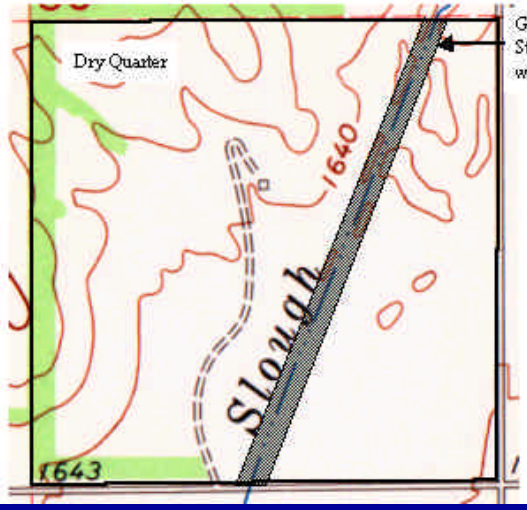
1. Field boundaries and field ID. Check the field ID on the map for a match with the field ID listed in Form 4, part 1. — Bottom 40
2. Identify location of all surface water features.
   - perennial (continuous) streams,
   - intermittent streams,
   - and drainage tiles,
   - drainage ditch
   - Small pond, reservoir or wetland;
   - Designated wetlands
3. Identify location of all ground water connections:[1]
   - Well locations — W
   - Drainage wells — DW
   - Rock outcrops
4. Identify current conservation measures and location including:
   - Grassed waterways
   - Other (e.g. areas of no or reduced tillage, terraces, grass filter strip, setback areas with no manure application, etc.). Clearly label each conservation practice — e.g. one pass tillage
5. Setback distances for no manure application (30 feet minimum) or modified application (possible for distances up to 100 feet) are required for perrenial streams, lakes and ponds, and tile inlets (with outlets that drain to surface waters or connections to surface waters)

   Setbact distances are not required intermittent streams, wells, buried tile lines, wetlands, irrigation reuse pits, manure storage facilities, or grassed waterways.
6. Management areas from which soil phosphorus tests are taken (draw in borders, label each area) — P | P

[1] Not required for NDEQ permit application.

Dry Quarter, Southeast ¼ of Section 30, Township 27, Range 1, Pierce County





Workbook Example - N Availability Calculation

Nitrogen Management Plan
Instructions for Crop Available Manure Nitrogen (Form 17)

Purpose: This worksheet will estimate a crop available nitrogen credit based for a known (calibrated) manure application rate.

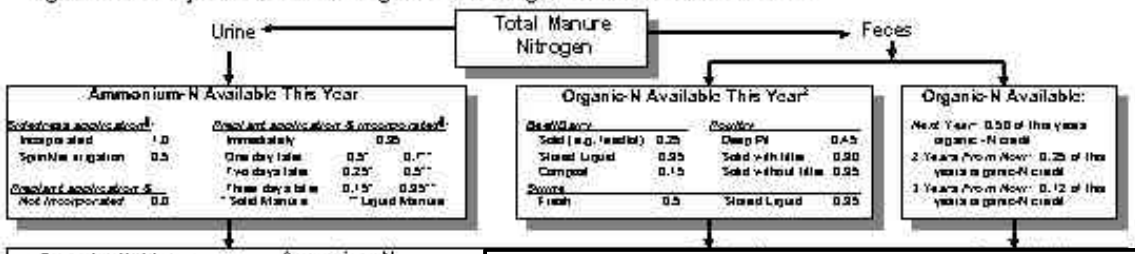
Regulations:
NDEQ's Title 130 requires that manure not be applied "in excess of agronomic rates for nitrogen". To comply with these regulations, the producer will need to annually prepare a Nitrogen Management Plan that determines Crop Available Manure Nitrogen, and keep these plans on file for five years (for NDEQ inspection).

Steps:
Col. a: This "Option #" is used again in the Annual Field Plan (Form 18, column 1) to reference the selected manure application option.
Col. b: Enter description of manure source (e.g. hog
open lot), season of application, and timing of i
Col. c. Enter the planned application rate. Applicatio
be calibrated to achieve approximately the desi

Instructions

Col. d: Enter the manure's ammonium-N from lab analysis or, if not available, an approximate nutrient content from Reference Table R-2 (p. 77).
Col. e: Fill in the ammonium-N availability factor based on the most applicable situation from the left box in Figure 1.
Col. f: Calculate crop available ammonium-N (col. c x col. d x col. e)
Col. g: Enter the organic-N in the manure from lab analysis (Total N - Ammonium N). If a manure analysis is not available, see Reference Table R-2.
Col. h: Enter the organic-N availability factor from the middle box in Figure 1.
available Organic N (col. f x col. g x col. h).
-N available over the next three years can be
plying the appropriate availability factor in the right
1 by the value in col. i.
This procedure should be repeated for each manure application system (or piece of equipment), each application rate, and timing of incorporation.

Figure 1. Availability factors for manure nitrogen. Values from figure should be entered into Form 17.



[1] Incorporation can be accomplished by tillage or rainfall of one-half i
[2] Organic-N availability assumes spring seeded crops such as corn and

Worksheet

Form 17. Crop Available Manure Nitrogen

Manure Application Options			Ammonium-N Available This Year			Organic-N Available This Year			j. This Year's Total N Available (f+i) (lbs/ac)	Organic-N Available:		
a. Option #	b. Manure Source, Season of Application, & Incorporation	c. Planned Application Rate	d. Ammonium-N Content ("as is" basis)	e. Available Factor (see Figure 1)	f. Available NH_4-N (c X d X e) (lbs/ac.)	g. Organic-N Content ("as is" basis)	h. Available Factor (see Figure 1)	i. Available Organic-N (c X g X h) (lbs/ac.)		k. Next Year (i x 0.5) (lbs/ac)	l. 2 Years From Now (i x 0.25) (lbs/ac.)	m. 3 years From Now (i x 0.12) (lbs/ac)
Ex.	*Feedlot manure, surface applied, incorporate in 24 hrs.*	*18*	☐ tons/ac ☐ 1000 gal/ac ☐ ac-in/ac	*4*	☐ Lbs/ton ☐ Lbs/1000 gal ☐ Lbs/ac-in	*16*	☐ Lbs/ton ☐ Lbs/1000 gal ☐ Lbs/ac-in	*0.25*	*72*	*108*	*36*	*18*	*9*
1			☐ tons/ac ☐ 1000 gal/ac ☐ ac-in/ac		☐ Lbs/ton ☐ Lbs/1000 gal ☐ Lbs/ac-in		☐ Lbs/ton ☐ Lbs/1000 gal ☐ Lbs/ac-in						
2			☐ tons/ac ☐ 1000 gal/ac ☐ ac-in/ac		☐ Lbs/ton ☐ Lbs/1000 gal ☐ Lbs/ac-in		☐ Lbs/ton ☐ Lbs/1000 gal ☐ Lbs/ac-in						
3			☐ tons/ac ☐ 1000 gal/ac ☐ ac-in/ac		☐ Lbs/ton ☐ Lbs/1000 gal ☐ Lbs/ac-in		☐ Lbs/ton ☐ Lbs/1000 gal ☐ Lbs/ac-in						

Software Example - Manure Use Planner

Manure Nutrient Availability Calculator
For Manure Application Options

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Previous Page | Setup Printout

Manure Application Option					Total Manure-N Available from This Application				Available Manure P_2O_5		
Option #	Identify Facility from Which Manure is Collected or Stored	Application Method/ Incorporation	Manure application Rate	Units	Available This Year (lbs/acre)	Available Next Year (lbs/acre)	Available 2 Years From Now (lbs/acre)	Available N 3 Years From Now (lbs/acre)	P_2O_5 Content (lb/unit)	Total P_2O_5 (lbs/acre)	Available This Year (lbs/acre)
Ex. 1	Swine - Confinement Barn & Deep Pit - Slur	Preplant / Immediate	4.0	,000 gal/ac	123	14	7	3	41	164	115
Ex. 2	Swine - Confinement Barn & Deep Pit - Slur	Preplant / No incorporation	6.0	,000 gal/ac	99	19	9	5	36	216	151
A	Beef - Open Lot - Solid Manure	Preplant / No incorporation	15.0	tons/ac	68	34	17	[illegible]	24	366	[illegible]
		Preplant / No incorporation	25.0	tons/ac	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	427
		Preplant / No incorporation	40.0	tons/ac	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	883
		Preplant / 1 day	30.0	tons/ac	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	512

For selected application rates...

...crop available manure nutrients are estimated...

Action Plan for Manure and Fertilizer Application for 2003 Crop Year

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Field ID	Manure Source	Planned Application Rate	Incorporate Manure into Soil? Days	Manure Nutrient Rate (lbs/ac) N	P_2O_5	Suggested Timing of Manure Application J	F	M	A	M	J	J	A	S	O	N	D	Application Equipment Settings	Additional Application Instructions	Commercial Fertilizer Application Type	Rate lbs/ac	Type	Rate lbs/ac	Type	Rate lbs/ac
Example-Home 80	Swine - Confinement Barn & Deep Pit -	4,000 gal/ac	Preplant / Immediate 0	132	164			x	x						x	x	x	3rd gear, 2000 rpm	50' setback						
Pivot	Beef - Open Lot - Solid Manure	25 tons/ac	Preplant / No incorporation	203	610			x	x									5th gear, 2200 rpm							
Feedlot quarter	Beef - Open Lot - Solid Manure	25 tons/ac	Preplant / No incorporation	169	610			x				x						5th gear, 2200 rpm							

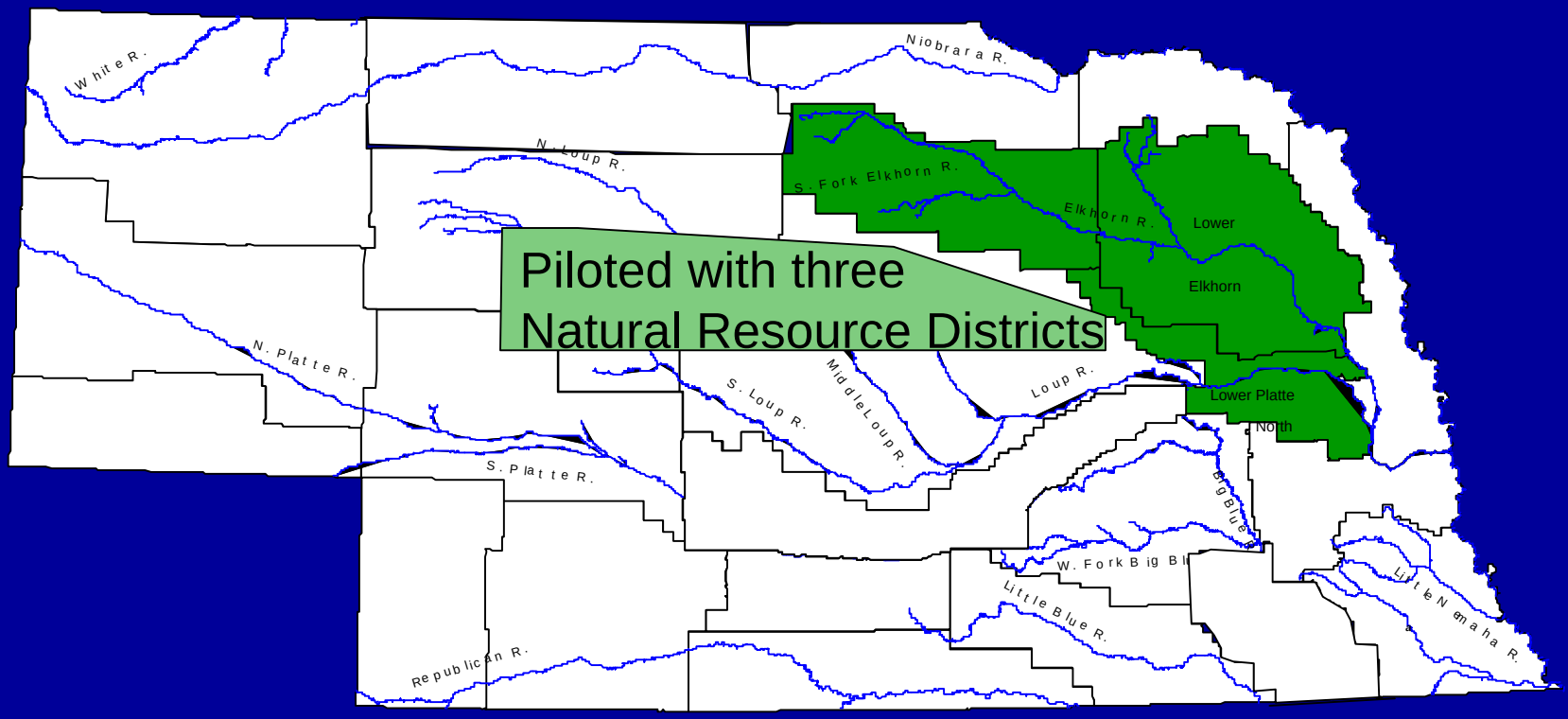
...leading to desired manure and fertilizer application rate

Objective 2:
Pilot test CNMP tools.

- **2001- 13 livestock producers and 20 advisors. Producers attended as a producer/advisor team.**

- **2002 - 63 livestock producers and 22 advisors**

NE CNMP Pilot Program



Objective 2: Pilot test CNMP tools.

- Producers were already active in manure management:
  - 55% calibrate equipment
  - 73% analyze manure in past 3 years
  - 49% have a written plan for manure application
  - credit, on average, 84 lbs. of N and 53 lbs. of P2O5 per acre for manure

Objective 2:
Pilot test CNMP tools.

- At conclusion of class producers could:

	Yes	Yes, with help
__Prepare a permit application	36%	58%
Estimate land requirements	71%	25%
Calculate N credit from manure	65%	29%
Identify records for permit maintenance	58%	36%

Objective 2: Pilot test CNMP tools.

- Other observations:
  - Most producers had little or no awareness of commitments made in their permit application. Lack of producer involvement in permit application was significant problem.
  - Hand calculation of N credits and Manure-N availability was major stumbling block.
  - Most (but not all) producers adapted well to spreadsheet tools.

Objective 3. Develop infrastructure for statewide implementation.

- NE Environmental Trust Fund supporting statewide implementation.
- 3 county based staff teams (13 agents) trained as regional CNMP specialists:
  - Four regional producer workshops planned
- Two technical service providers, co-hosted with NE CCA program and NRCS planned.

CNMP Model for Nebraska

CNMP
Coordinating Professional

Facility
Engineering
& Design

Technical
Service Provider -
Four Components
of Training

Manure
Use
Planner

Conservation Planner

CNMP Planner Core Skills

CNMP Introduction

- *Identify water quality contaminants in manure and transport mechanism*
- Complete a Whole Farm Nutrient Balance
- Prioritize nutrient management strategies.

Agency and Regulatory Requirements

- *Ability to access NRCS standards, Cooperative Extension resources, LPES curriculum*.
- *Working knowledge of state and federal rules*

Italics-Manure Use Planner

CNMP Planner Core Skills

Animal and Feed Management

- Estimate manure nutrient excretion based upon diet.
- Estimate land area requirements based upon diet
- Identify feed program strategies that will impact nutrient excretion

Manure Mgmt. in Cropping Systems

- *Estimate crop available nutrients from a manure.*
- *Assemble an annual crop plan balanced for crop N & P*
- *ID agronomic and environmental benefits of manure*
- *Develop an O&M plan*.

Italics-Manure Use Planner

Nebraska's Comprehensive Nutrient Management Planning Process

For more information, see poster display on Monday