

Comprehensive Nutrient Management Plans (CNMP) in South Dakota



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Resources Before You Begin a CNMP

1. SD Nutrient Management (590) CPS dated December 2012 and All other applicable CPS (313, 635, etc....)
2. Current SD DENR Permit
3. Current County Zoning Regulations
4. SD 10 Element CNMP Workbook (2013)
5. Example CNMP Plan
6. SD Nutrient Management Tool (2013)
7. SD Phosphorus Index
8. SD Leaching Tool or County Specific Leaching Map

Comprehensive Nutrient Management Plan (CNMP)

1. Background and Site Info
2. Manure & Wastewater Handling and Storage
3. Farmstead Safety and Security
4. Land Treatment Practices
5. Soil and Risk Assessment Analyses
6. Nutrient Management
7. Feed Management (Optional)
8. Other Options (Optional)
9. Record Keeping
10. References

New 590 Based on 4 R'S of Nutrient/Manure Management

Right Source, Rate, Time, Place

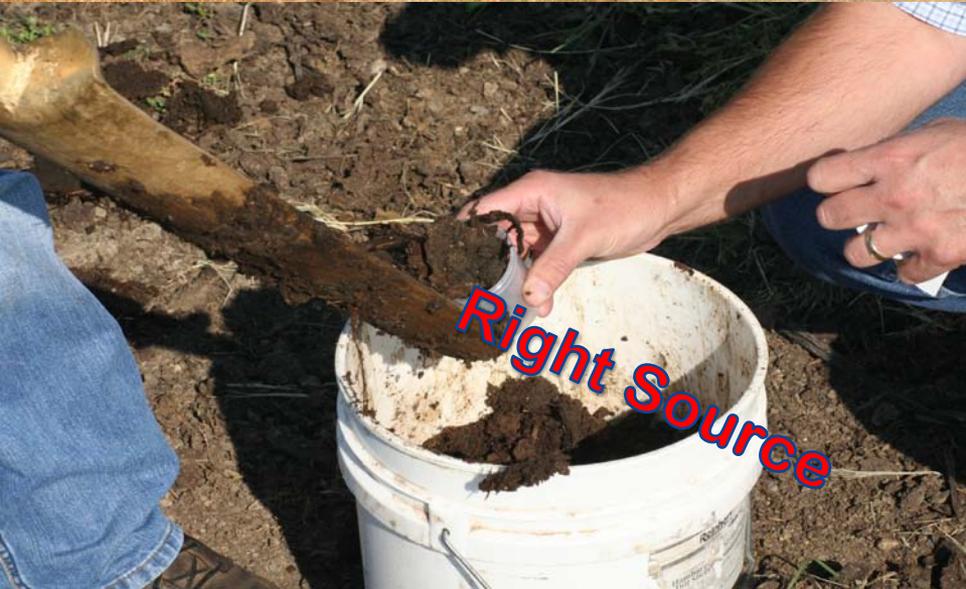
Right Time



Right Rate



Right Source



RIGHT PLACE



New 590

- Emphasis on 4R's of Nutrient Management: Right Time, Place, Rate, Source.
- Not just manure, all sources of nutrients must be in budget and accounted for.
- Consider pH – “must be maintained in range that allows for crop nutrient availability and utilization”
- Potassium is now a consideration if applications cause an “unacceptable nutrient imbalance in crops/forages”

590 (Rate)

- Use SDSU EC750 Guidelines or industry practice if approved by SDSU.
- Account for all nutrient sources ie...manure, commercial fertilizer, legumes, starter etc...
- Rate based on:
 - Crop Sequence (5 years)
 - Soil Test (1 year max for N) (2 year max P & K)
 - Nutrient Risk Assessments for N & P
 - Realistic Yield Goal

Right Rate

Soil Sample



Manure Sample



Calculate a Rate based on realistic yield goal, soil test, manure test, and complete nutrient budget.

Use SDSU-EC-750 Guidelines

Calibrate Equipment



Rate Continued

- Setting a Yield Goal:
 - Average of 3 highest crop insurance yields + 10%
 - Proven yield for a continuous 3 year average + 10%
 - NRCS Productivity Index + 10%
 - Ag Statistics County Average + 10%

Rate – Relate to \$\$\$\$\$

63 Tons/Acre = \$800/Acre Worth of
Nutrients but 3X more N than needed



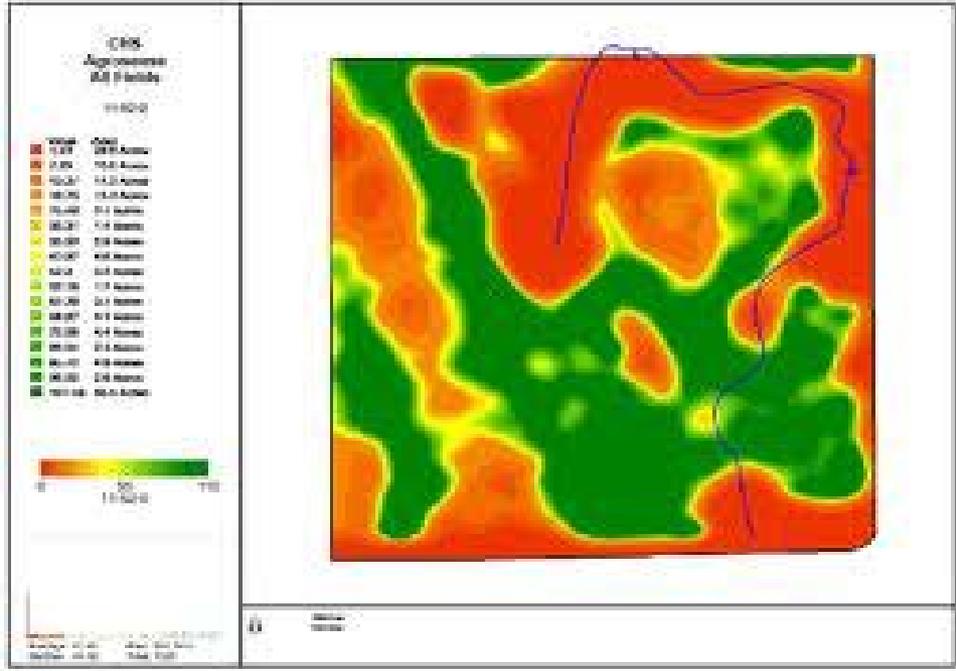
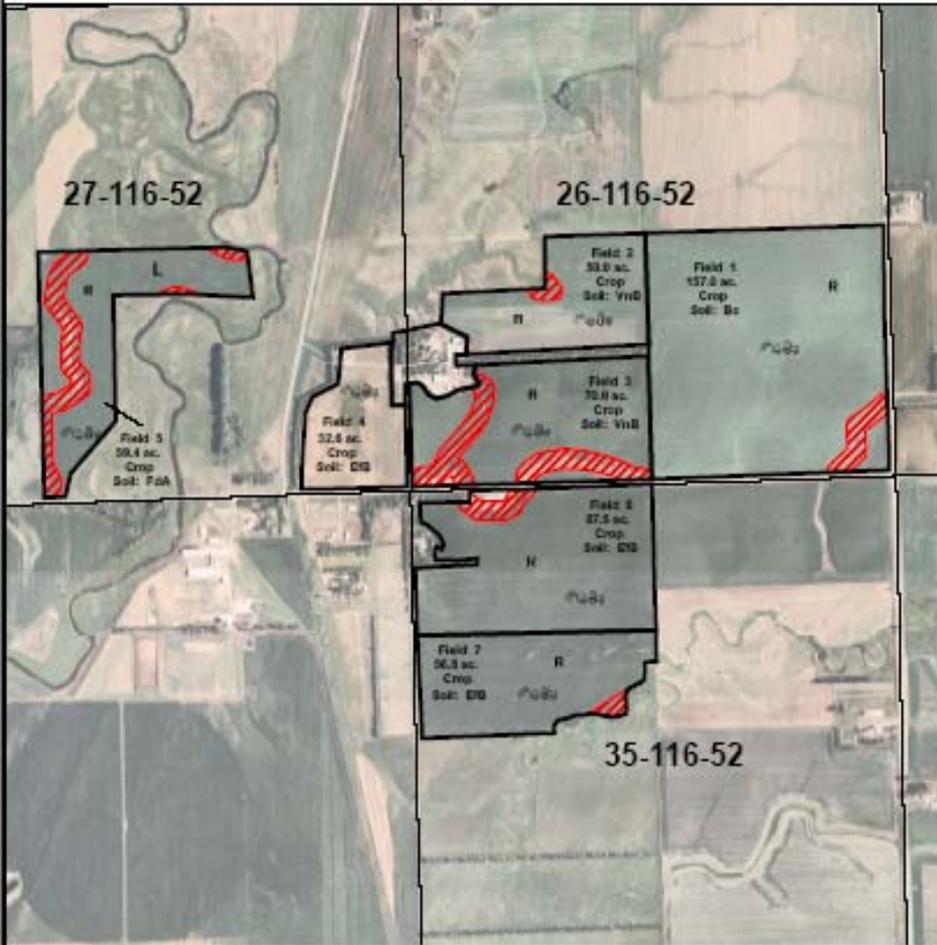
590 (Time & Place)

- Timing and placement must correspond as closely as practical with nutrient uptake (utilization by crop)
- If field has “High Leaching Potential” commercial nitrogen will not be applied more than 45 days prior to planting (Exceptions are incidental N in commercial P and manure).
- Commercial Phosphorus must be place below soil surface or incorporated (Exceptions are on no-till crop land or perennial vegetation).

Right Place

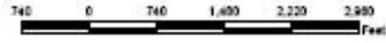
Water Quality Risk Assessment Map

Customer(s): John Doe



Legend

- Manure Application Fields
- Setback and/or Exclusion Areas
- Leaching - High Risk
- Runoff - High Risk



590 (Time & Place)

- Setbacks for manure application:
 - 100 feet from surface water or conveyance (tile inlet, drainage ditch, waterway, gully)
 - 35 feet if perennial grass filter strip is established and maintained.
 - **ENCOURAGE MORE FILTER/BUFFER STRIPS ALONG WATER BODIES!!!!!!!!!!!!!!**



Filter/Buffer

Strips=

- Improved water quality
- Increased wildlife
- Good public perception

590 (Time & Place)

- Winter Application:
 - No liquid application on saturated, snow covered, or frozen soils.
 - Solid Application allowed under these conditions:
 - Incidental amounts when cleaning open lots, bunk lines, enclosed pens to facilitate feeding and handling.
 - If natural disaster or extraordinary weather prevent application during planned periods.
 - **Requires updated NMP and documentation showing need etc.....**

590 (Time & Place)

Application on Saturated, Snow Covered, or Frozen Soil Requirements:

- a. If permitted facility contact DENR
- b. Provide documentation & NMP update (document need)
- c. Calculated rate based on fall soil test
- d. 300 feet setback from conveyances; 1,000 feet setback from named water body
- e. Avoid floodplain soils
- f. Less than 4% slopes
- g. Use RULSE to prioritize
- h. Spread uniformly
- i. Recommend taking new manure test

Right Time?



590 (Additional Criteria to Consider to minimize source pollution)

- Controlled release fertilizers
- Nitrification and urease inhibitors
- Tissue testing
- Split application of N
- Spectral analysis technology (Green Seeker)

**Phosphorus Conservation
= Soil Conservation**



Nitrogen Conservation Options

<u>In-field</u>	<u>Potential % Reduction in N Loss</u>
Use Correct N rate	Up to 18%
Correct N application timing	Up to 25%
<u>Nitrogen Inhibitors</u>	<u>Up to 27%</u>
Cover crops	Up to 30%
<u>Filter Strips</u>	<u>Up to 35%</u>
Bioreactors	Up to 40%
Created Wetlands	Up to 75%

590 (Additional Criteria for Manure)

- Application must not exceed soil infiltration or water holding capacity
- Consider rooting depth
- Consider subsurface drain tile
- Monitor soil salinity and salt content
- Minimize N loss from denitrification and volatilization.

Nutrient Management Issues

- SD Nutrient Tool (SD-CPA-63) not filled out correctly or adequately, must account for all sources not just manure.
- WQRA maps inadequate (no R, L, no legal)
- ????? Time spent doing field assessments
- Winter application setbacks not correct
- Signature page not signed by everyone
- Include all 10 sections, otherwise not a CNMP
- Provide more options ie..filter strips, waterways, etc.....

Nutrient Management Issues

- Not using most current county zoning or not addressing zoning at all.
- Issues with lease agreements
- Not using current soil tests
- Using unrealistic yields
- Engineer vs. Agronomist (Need to form a pact)

References

- South Dakota Department of Environment and Natural Resources. *General Water Pollution Control Permit for Concentrated Animal Feeding Operations*, October 20, 2003
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- United States Department Of Agriculture – NRCS. *Sampling Soils for Nutrient Management*, SD-NRCS-FS-50, 2012 [ftp://ftp-fc.sc.egov.usda.gov/SD/www/Technical/Man Nut Mgmt/SamplingSoilforNutrientManagement.pdf](ftp://ftp-fc.sc.egov.usda.gov/SD/www/Technical/Man_Nut_Mgmt/SamplingSoilforNutrientManagement.pdf)
- United States Department Of Agriculture – NRCS. *Using Manure Analysis Results*, SD-NRCS-FS-38, March 2003 [ftp://ftp-fc.sc.egov.usda.gov/SD/www/Technical/Man Nut Mgmt/SDNRCSFS38 analysis.pdf](ftp://ftp-fc.sc.egov.usda.gov/SD/www/Technical/Man_Nut_Mgmt/SDNRCSFS38_analysis.pdf)
- United States Department of Agriculture – NRCS – SD – Comprehensive Nutrient Management Planning Website: www.sd.nrcs.usda.gov/technical/Nutrient_Management.html

Try to Look at the Big Picture When Developing CNMP

Problem Solved!!!!!!!!!!!!!!

Still a Problem???????

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