

Minnesota ERP for Small Dairies



**Minnesota Pollution
Control Agency**
Al Innes

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Minnesota Dairy ERP pilot – SELF-Assessment phase

- 43 volunteers in 4 non-delegated counties – 23 completed self-assessments and were received baseline inspections in 2007
- 44 controls in 9 non-delegated counties were randomly selected and received baseline inspections in 2007
- Repeat the cycle March thru September 2008
- Compare baseline and second year data in fall 2008
- **Multi-issue, multi-program compliance content**
 - lot runoff, manure management, septics, wells, pesticides, underground storage tanks, burn barrels
- **Beyond-compliance content**
 - buffers, cropping

Baseline Data - #1

DATA	VOLUNTEERS (V=23)	CONTROLS (Ca=21; Cb=23)	Significant difference
Overall compliance score	80% (rge 62→100)	75% (rge 51→89)	Y (V/Cb)
Overall beyond compliance score	59.7%	46.9%	Y (All)
Overall self-assessment accuracy	69%	NA	
RTC plans complete	16.7%	NA	
Sensitive location	30% yes	18% yes	Y (V/Cb)
Total herd size (AU)	152 ave (48→524)	107 ave (6→483)	Y (V/Ca&Cb)
Herd trend	26%↑ 65%↓ 9%→	Not yet known	
Lot run-off direct to water	95.6% in compl	88.6% in compl	
Lot run-off thru adequate buffer	68.4% in compl	61.9% in compl	
Manure application: first year N	47.8% in compl	36.4% in compl	
Apply manure w/in 25 feet of water	80.9% in compl	96.1% in compl	

Baseline Data - #2

DATA	VOLUNTEERS (V=23)	CONTROLS (Ca=21; Cb=23)	Significant difference
Incorp. spread manure in 24 hrs	13% yes	9.1% yes	
Manure app records: 100-299 AU	41.7% in compl	25% in compl	
Manure app records: >300 AU	100% in compl	100% in compl	
Septics pumped every 3 years	39.1% yes	18.2% yes	
Wells: upslope or protected	100% in compl	97.7% in compl	Y (V/Cb)
Household waste: burn barrel use	78.3% in compl	56.8% in compl	Y (V/Cb)
Cropping: 50-100' buffer by water	50% yes	15.9% yes	Y (V/Ca&Cb)
Cropping: 30% residue or strip till	77.3% yes	54.5% yes	Y (V/Ca)
Crop rotation: 2+ crops/3 years	91.3% yes	84.1% yes	Y (V/Cb)
crop rotation acres – total/ave	7,915/440	13,079/347	
Soil sampling	82.6% yes	65.9% yes	Y (V/Cb)

Baseline Data #3 – MinnFARM open lot model

- **Annual loadings of pollutants *after* any and all treatment (BOD5, P, COD, N, Fecal Coliform)**
- **Five main parameters in MinnFARM:**
 - 1) Lot size (a primary factor influencing run-off volume)
 - 2) Buffer (or vegetative treatment area) size and type
 - 3) Soil type (even though most are hydrologic B group)
 - 4) Stocking density of lot
 - 5) Area 2 contributions (clean water that flows through the lot).
- **Projected loadings are based on county-by-county averages for annual precipitation including all events experienced every 25 years**
- **MinnFARM is NOT the final word on compliance**

Baseline Data #4 – MinnFARM open lot model

- **For farms modeled (55):**
 1. 6391 AU total or 116 AU average per farm
 2. Annual farm discharges (average/total):
 - COD – 234/12,853 (pounds)
 - Nitrogen – 12/666 (pounds)
 - Fecal coliform - 6.07 E +13/ 3.34 E +15 (CFUs)
 - Phosphorus - 3.4/189 (pounds)
 - BOD5 – 53/2,889 (pounds)
 3. 13 of 55 or 24% exceeded BOD5 “proposed load limit” – this did not always sync with inspector’s initial compliance determination for discharge reaching water without sufficient treatment
- **Program will continue to learn how MinnFARM can work with compliance determinations**

Working ERP with Dairies

- **Voluntary, pilot – open air and seasonal**
- **Uncertainty over final deployment**
- **55 of 87 counties have delegated feedlot programs**
- **Natural expansion to beef cattle**
- **Shifts between milking and beef or feeder stock depending on milk, beef, and corn prices**
- **Attrition of dairies – generational turnover**
- **One year is very short for farm improvements**
- **State rules apply to all but very smallest but total amount spent on return to compliance is limited by state law**
- **How “easy” or “low-cost” fixes can improve results**
- **How information is transmitted AND USED (simple messages, e.g. 200 sq ft of feedlot space/head)**
- **How much progress made on their own (value of ERP?)**

What's Next?

- **Expand into other sectors – auto body**
- **State-wide voluntary for smaller feedlots?**
- **Just in non-delegated counties?**
- **Mandatory thru 4-year feedlot registration cycle?**

What's Next?

- **If mandatory, must whittle down questioning**
 - Operating in 10 years?
 - In shoreland?
 - Average annual acres under manure application?
 - Does lot run-off get to surface water after buffer?
 - Is Liquid Manure Storage Area (LMSA) approved?
 - Carcass disposal practices?
 - Keep manure application record?
 - Apply manure within 25 feet of water?
 - House septic pumped or inspected in last 5 years?
 - Is burn barrel used?
 - 50' buffer with no channeling adjacent to water?
 - Estimated acres in crop rotation?

For More Information

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Project documents:

<http://www.epa.gov/innovation/stategrants/minnesota.htm>