

Winter Manure Applications: Sound Practice or Risky Business?

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Some Facts about Wisconsin Manure Application*

- 2/3 of Wisconsin Farms have adequate cropland for manure applications
- Many farms use less than half of available acres for manure application
- 10-25% of manure applications occur in winter
- 75-95% of winter applications are outside the “SWQMA”

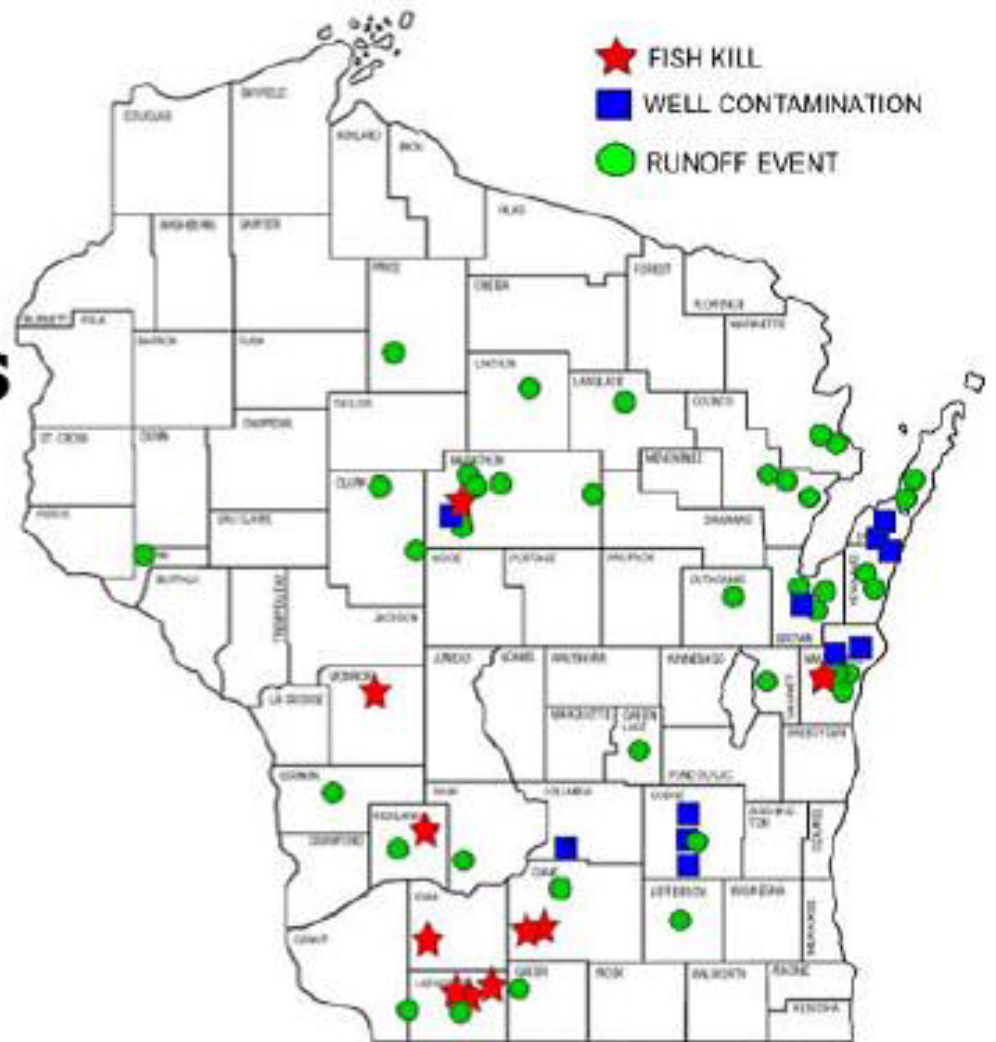
* From “On-Farmers Ground” Project (54 farms typical of Wisconsin Dairy Industry)

Some Facts about Winter Runoff

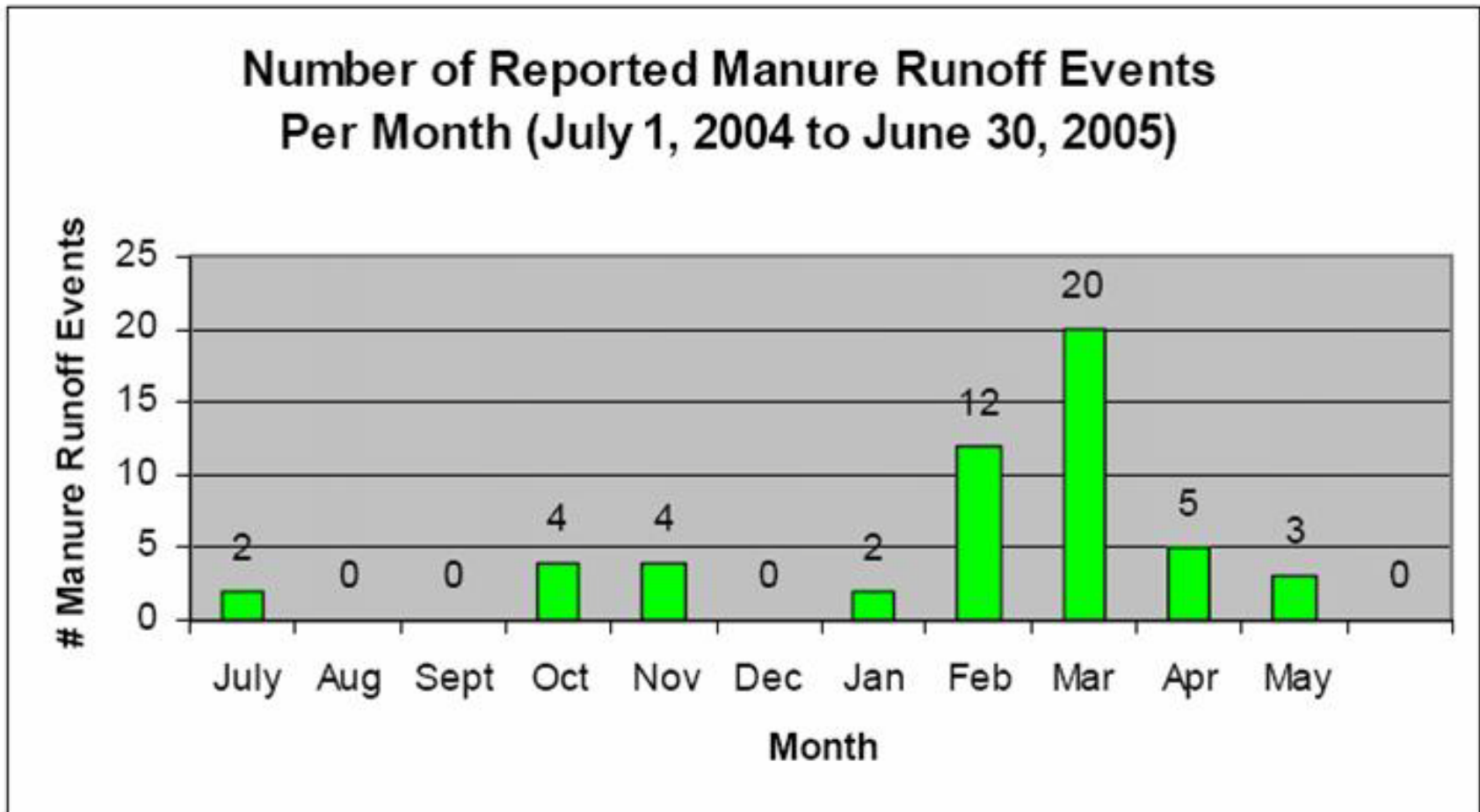
- On average, 1/3 of runoff occurs as snowmelt
- Winter runoff is characteristically low in sediment
- Nutrients are primarily in dissolved forms
- Little or no infiltration occurs
- Winter manure applications are on public “radar screen”

Manure-Related Fishkills, Well Contaminations and Runoff Events

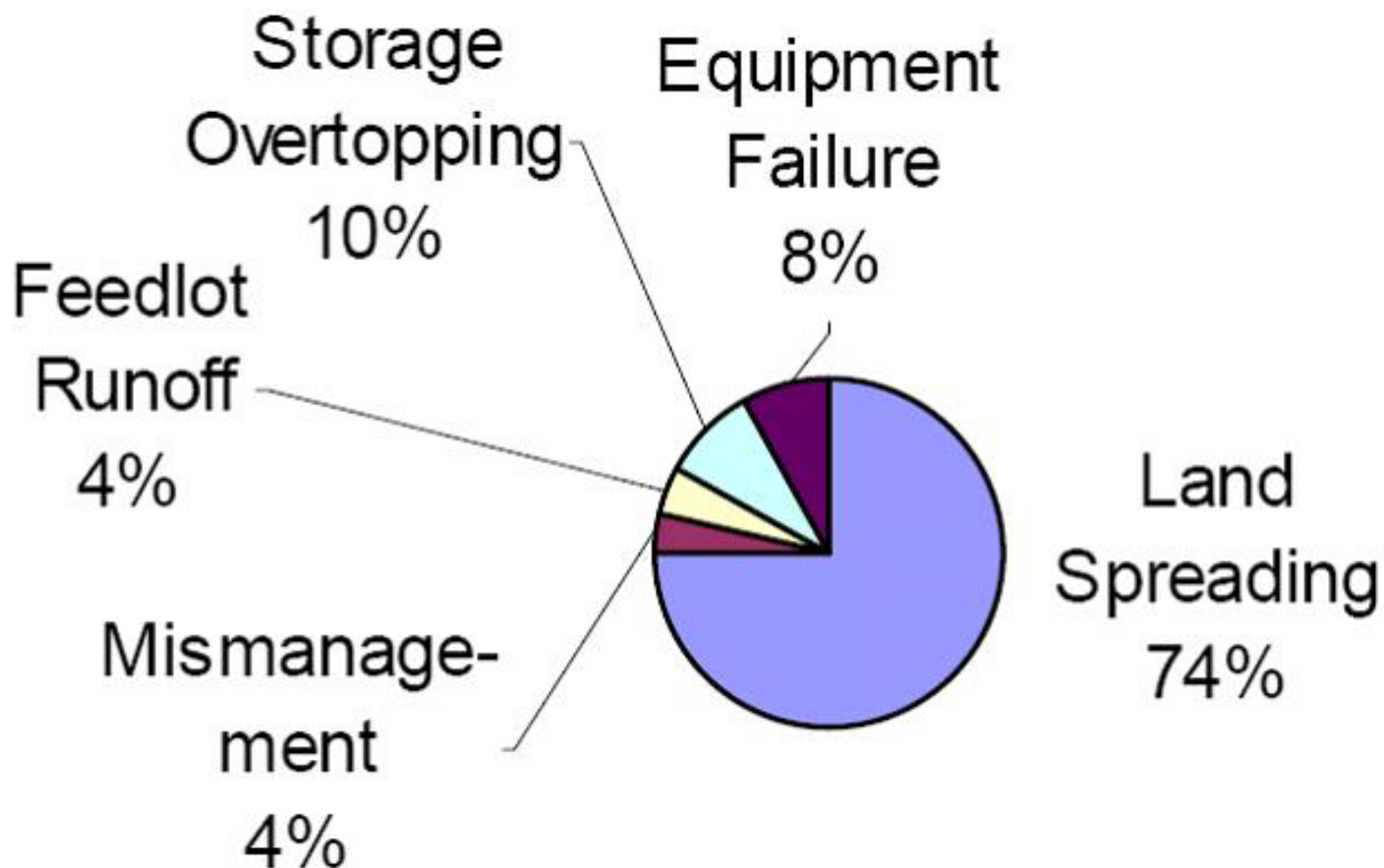
March 1, 2004 - June 1, 2005



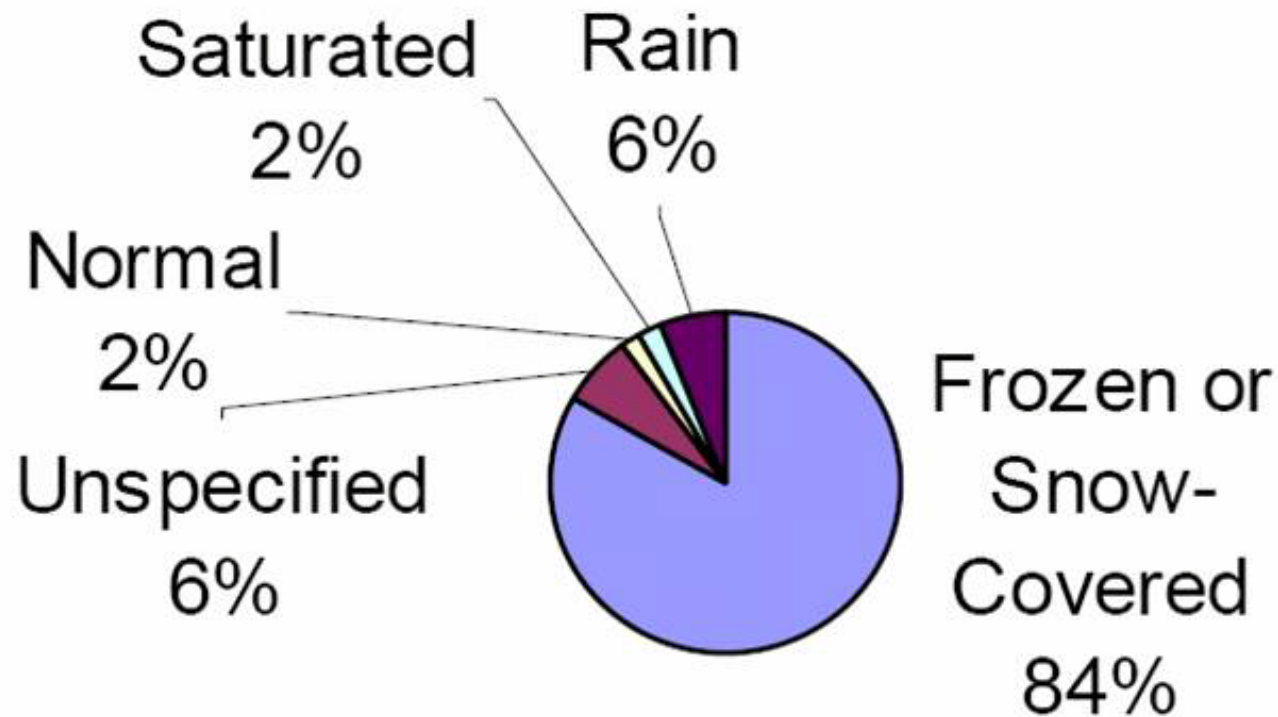
Distribution of 52 runoff events



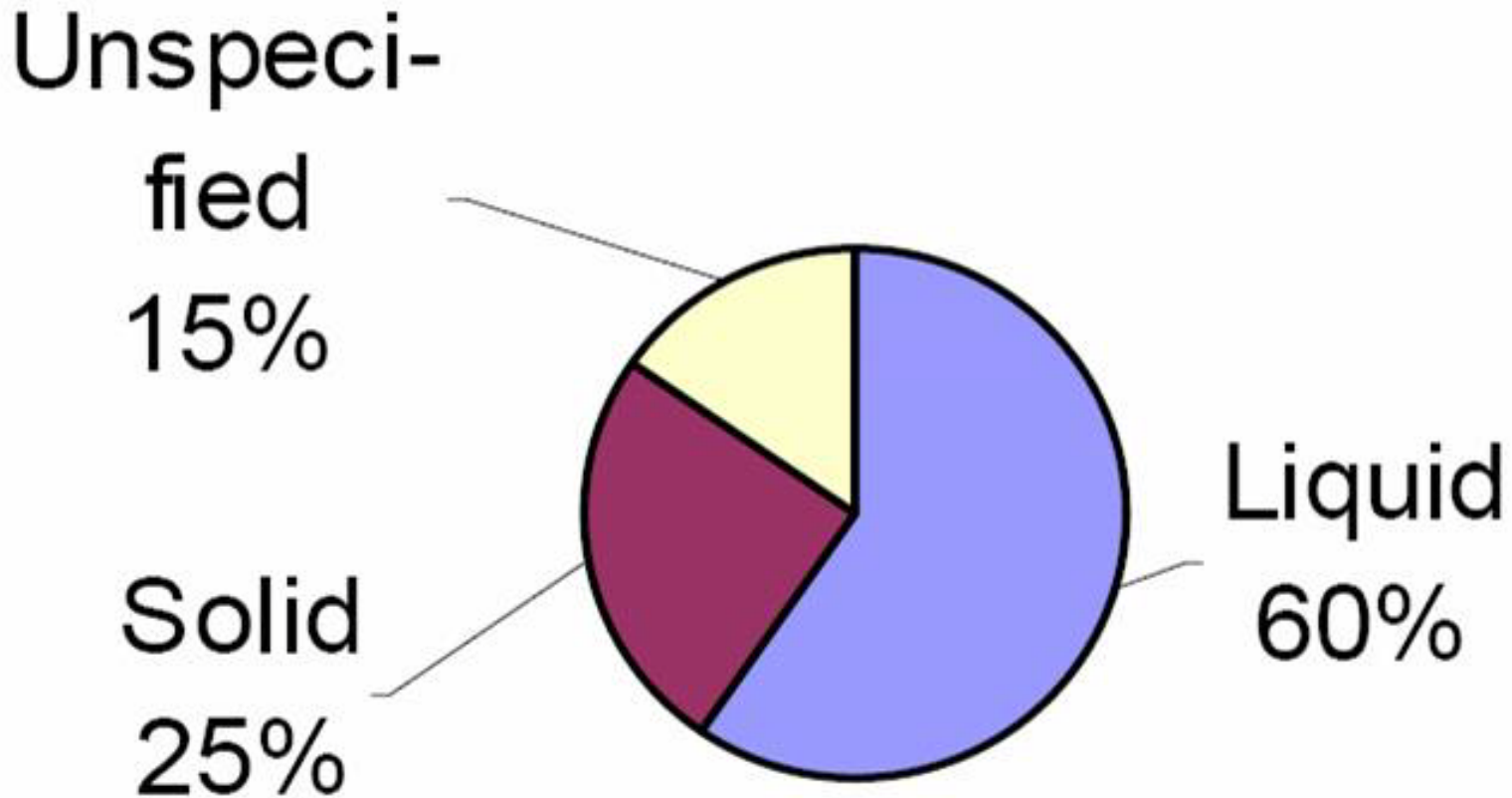
Causes of Manure Runoff Events



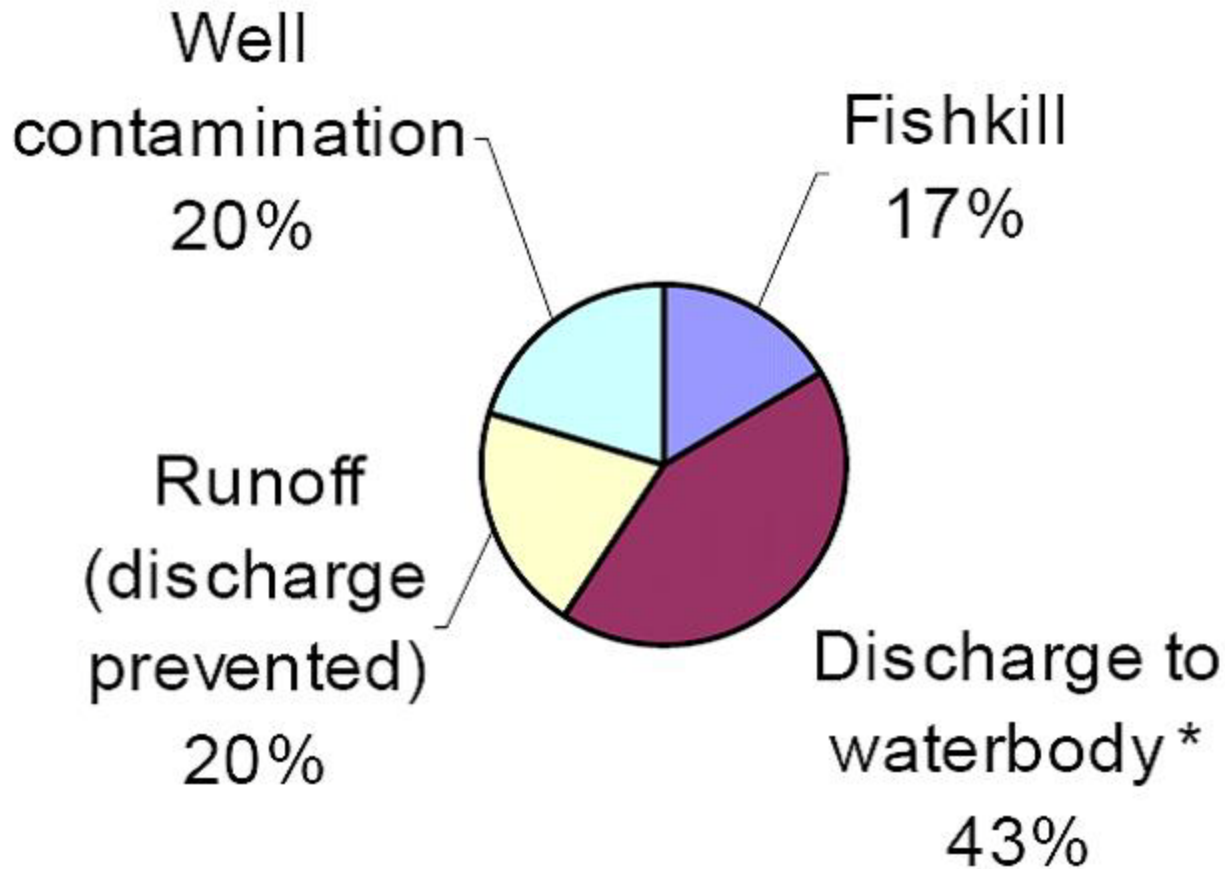
Soil Conditions During Landspreading



Liquid vs. Solid Application Resulting in Manure Runoff



Impacts of Manure Runoff Events



* Some events had multiple impacts

Acute losses

- Runoff that occurs soon after a surface manure or fertilizer application
- In data compiled from UW, Discovery Farms, and Pioneer Farm, acute P losses ranged from 0.5 to 3.4 lb/acre.
- Of eight events considered acute, seven were winter snowmelt events.
- Winter manure applications pose a threat for acute (single-event) runoff losses

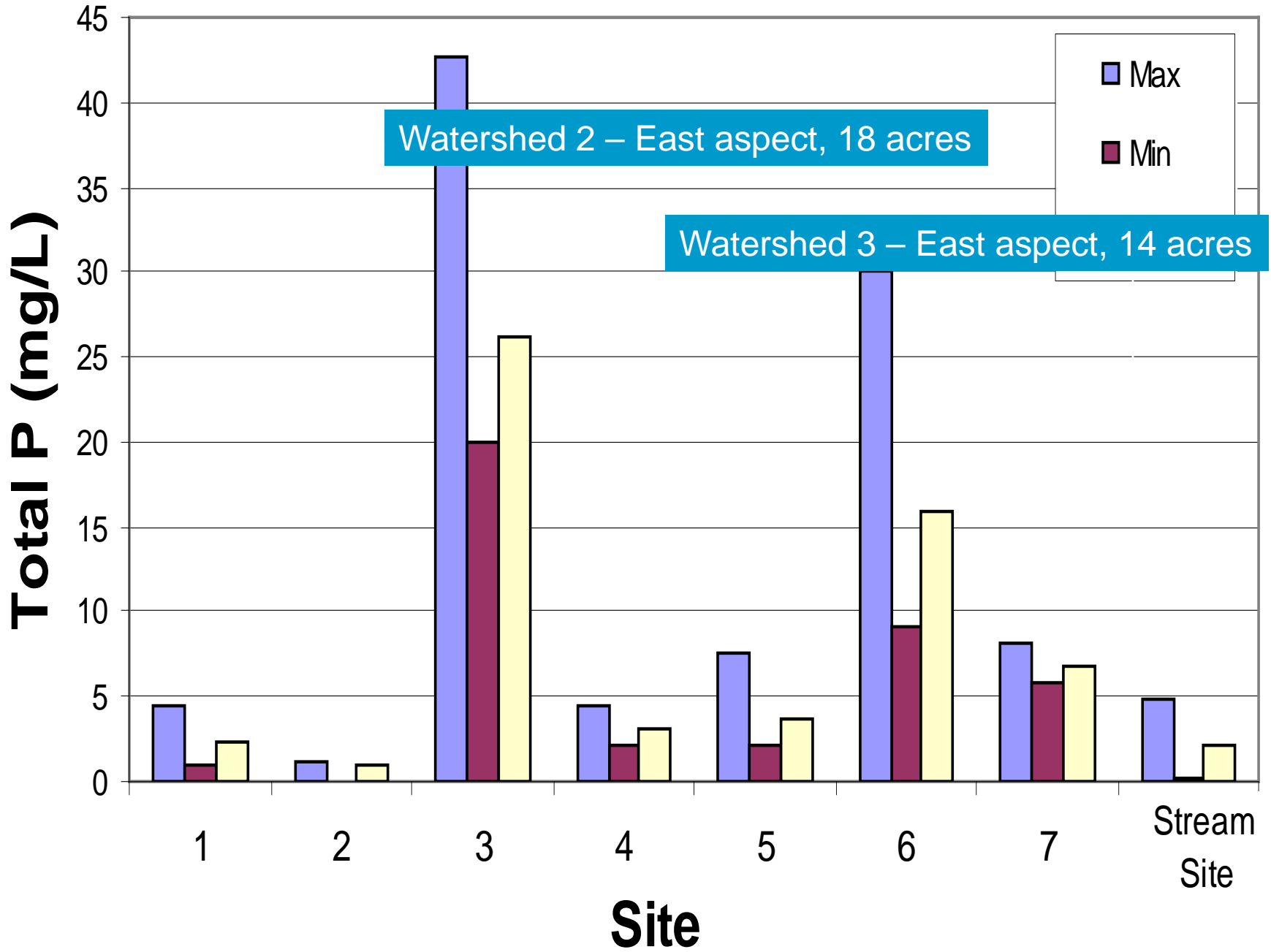
Summary of Winter Manure – Related Research*

- Nutrients lost from runoff following winter applications are usually greater than from manure spread in other seasons
- Risk of manure runoff appears similar, whether manure is spread on frozen bare ground or snow-covered ground
- Spreading manure onto a cover crop does not necessarily reduce the risk of runoff

*Fleming and Fraser (2000), Impacts of Winter Spreading of Manure on Water Quality – Literature Review, University of Guelph.

Direct Effects of Manure on Snowmelt

- Research indicates solid manure applications can retard snowmelt under specific circumstances
 - Can act as an insulator
- Liquid manure applications generally increase rate of snowmelt
- Effects observed in the field can be variable
- Timing of application is critical



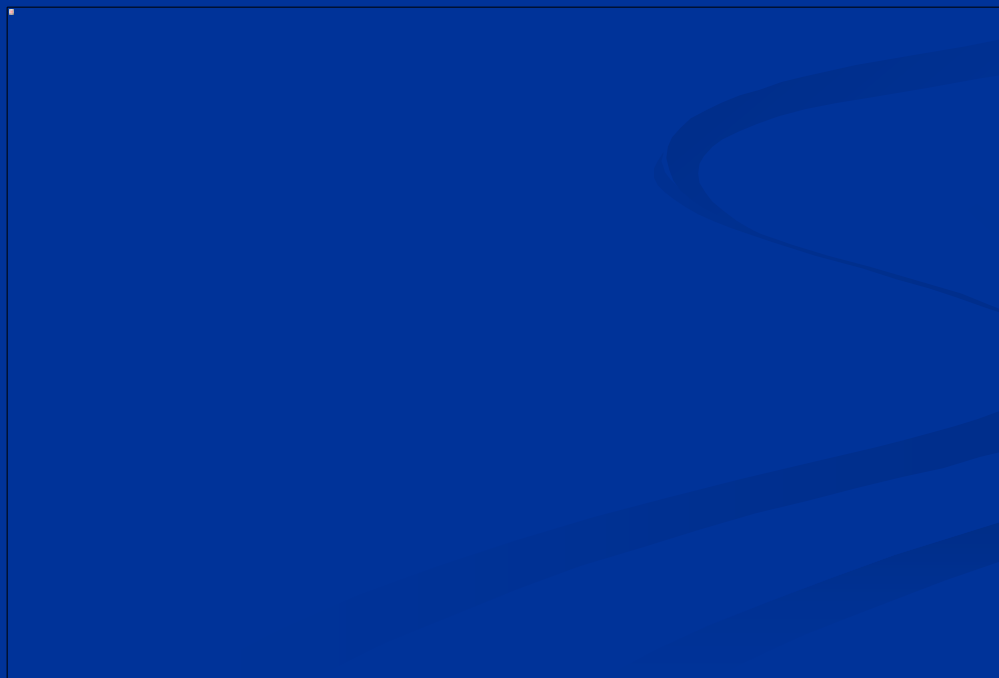




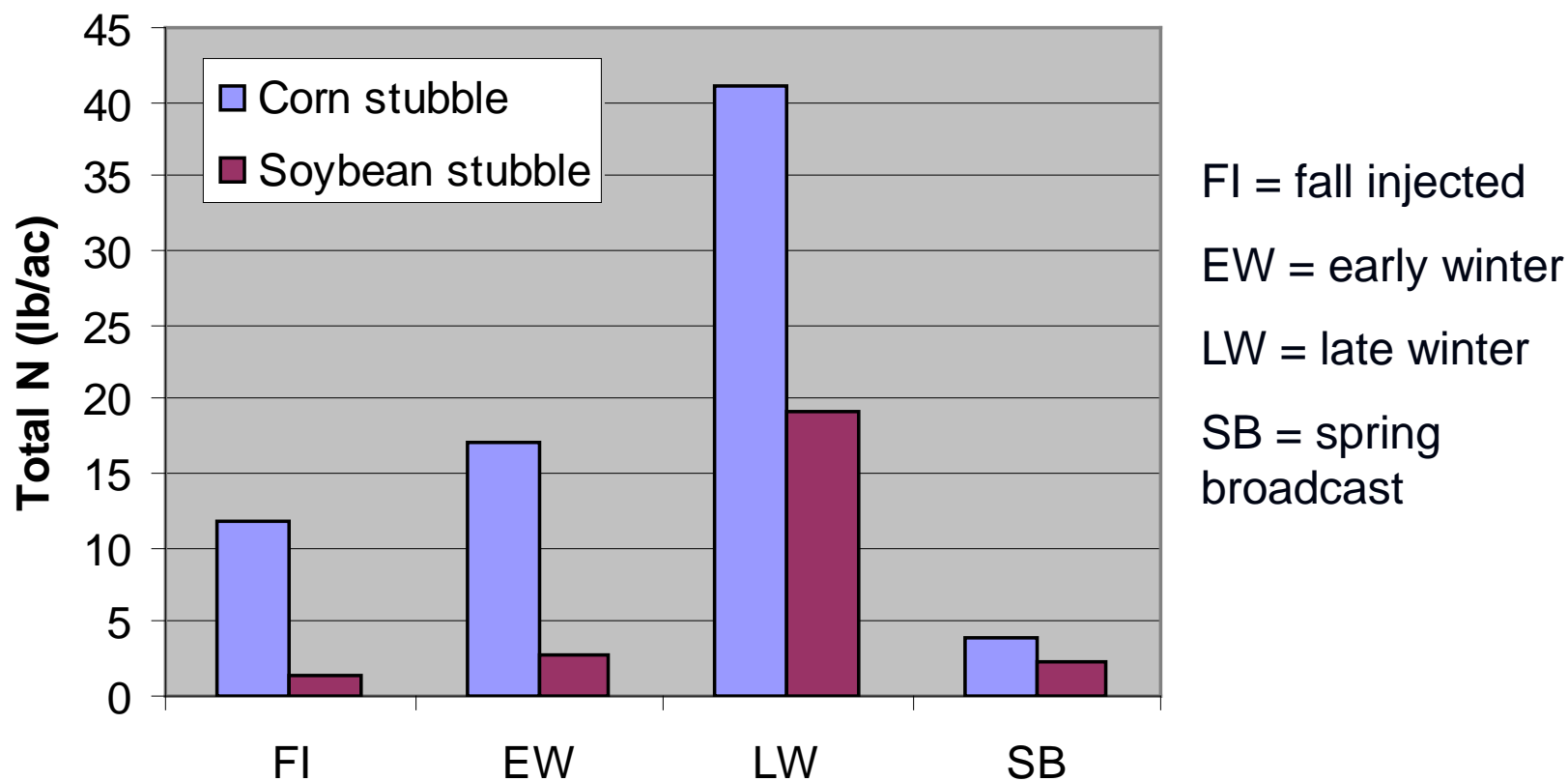








Timing and Manure Application Effect on Runoff Losses (2 yr average)

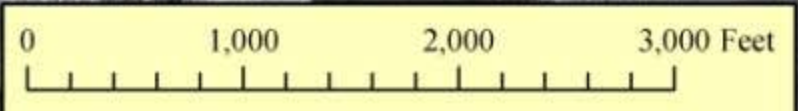


Pioneer Farm Runoff Monitoring

Solid manure applied
winter 2004-2005

Solid manure applied winter
2002-2003

Station	Acres
S1	33
S2	18
S3	14
S4	74
S5	14
S6	2.6
S7	43
S8	29
S9	20
S10	10
S11	3.5



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Manure spill settlement likely in Waunakee County

Associated Press

September 23, 2005

A Kewaunee County dairy farm reached a proposed settlement in state and federal lawsuits over the spread of liquid manure that a rural Luxemburg family claims polluted their well and sickened them.

The settlement, which still needs court approval, would require Glen Stahl to make environmental improvements at his farm and pay a fine to the state. His insurance company would pay the Trembl family \$80,000.

According to the federal lawsuit, Stahl runs a 900-cow farm near the Trembl family and spreads liquid manure on an 80-acre field across the road from their well.

Members of the Trembl family, including three young children, became seriously ill last year from exposure to contaminated drinking water caused by the manure pollution, the lawsuit claimed. The family had water trucked to their home for a time because of the problem.

2003 Winter Runoff - 3 events



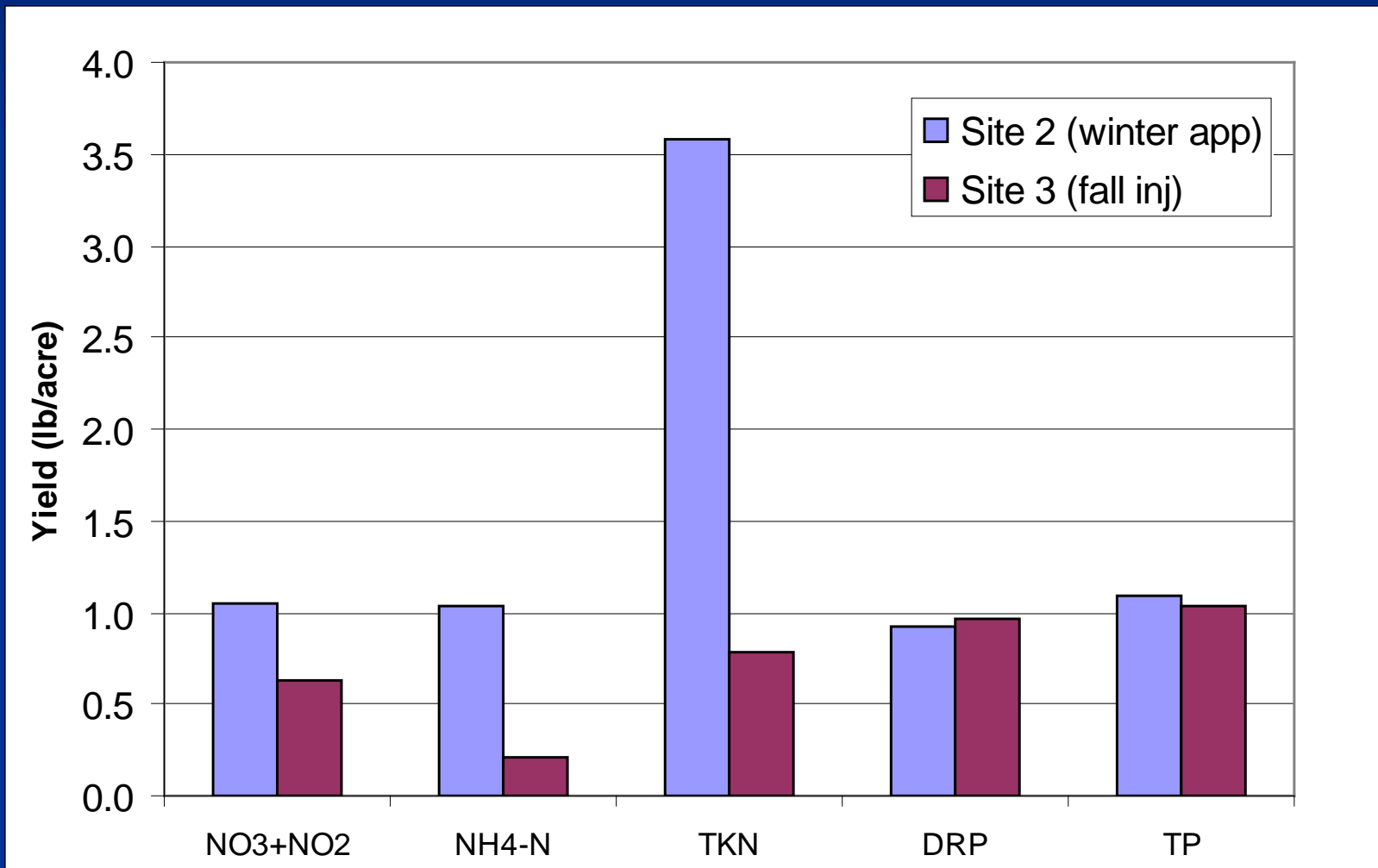
Winter
Manure
applied

2004-2005 Winter Runoff – Pioneer Farm

- Only solid manure applied to Watershed #2 in late January-Early February
- Site malfunction caused incomplete sampling of 1st snowmelt event following manure application.
- Data and photo observations indicate runoff occurred more rapidly in Watershed #2 compared to Watershed #3.

Winter Runoff from Sites 2 and 3

2 events, February 2005



Why don't we know more about watershed-scale snowmelt runoff?

- Watershed – scale monitoring of snowmelt runoff is laborious and time-consuming
- Rainfall-runoff monitoring equipment is often unsuitable



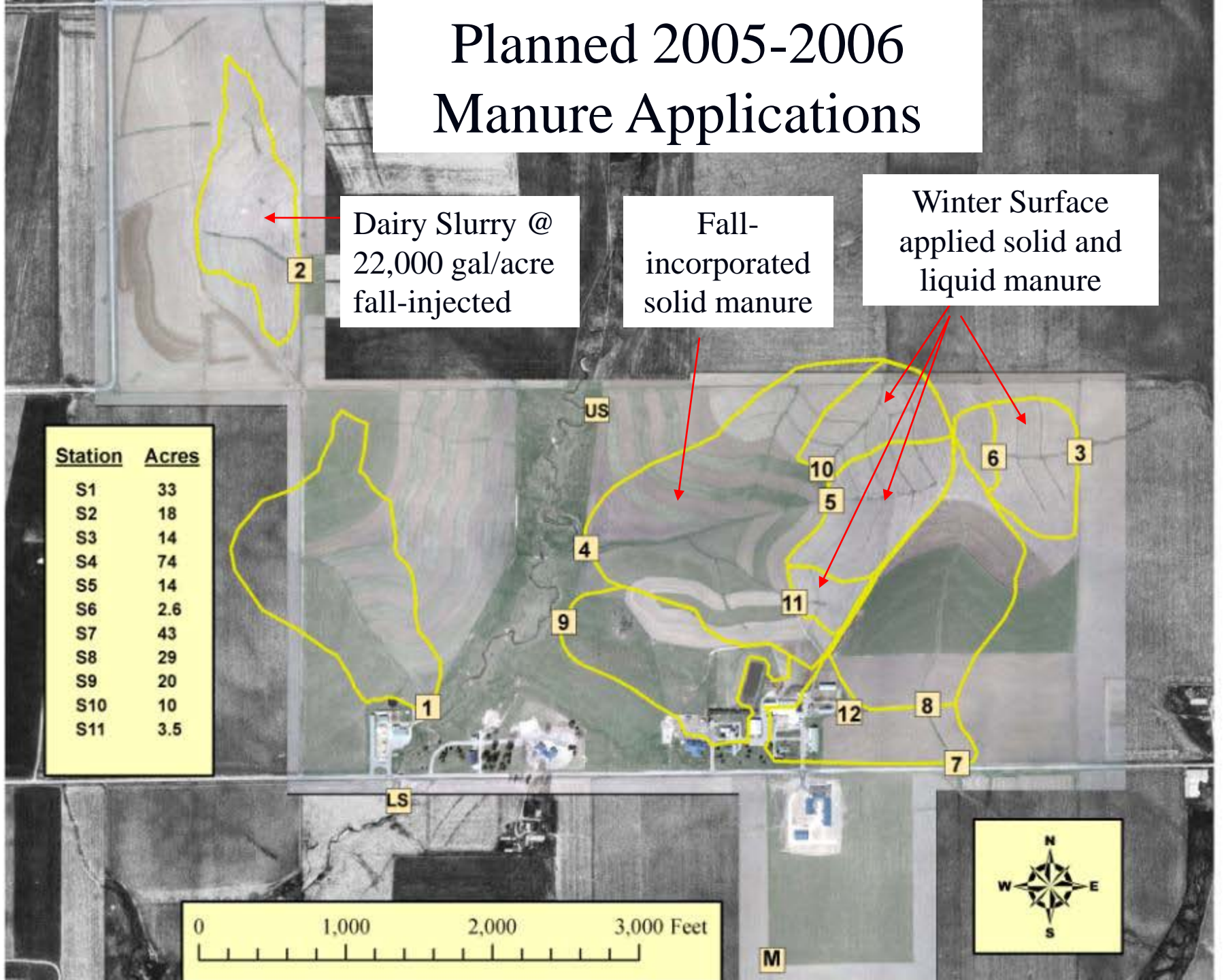
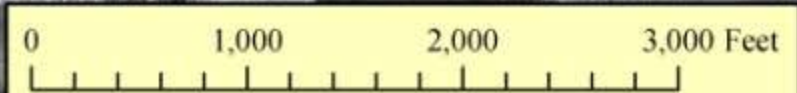
Planned 2005-2006 Manure Applications

Dairy Slurry @
22,000 gal/acre
fall-injected

Fall-
incorporated
solid manure

Winter Surface
applied solid and
liquid manure

Station	Acres
S1	33
S2	18
S3	14
S4	74
S5	14
S6	2.6
S7	43
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Winter Manure and the 590

- “When frozen and snow-covered ground prevent effective application and the nutrient application is allowed...”
 - Do not apply within the SWQMA (within 300’ of streams, within 1000’ of lakes and ponds)
 - Do not exceed P removal of following seasons crop

Winter Manure and NR 243

- No liquid manure applications on frozen or snow-covered ground
- Solid manure spreading prohibited in February and March unless incorporated
- CAFOs are required to have 6 months of manure storage

Points to remember

- Commercial fertilizer applicators don't apply in winter
- Following a NMP or CNMP does not relieve liability
- “Weather” is the single greatest factor affecting losses
- Winter manure management is a type of risk management

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