



Managing a Dairy Based Cropping System to - Protect Water Quality and Build Soil Health

Nobis Dairy Farms

Larry Nobis

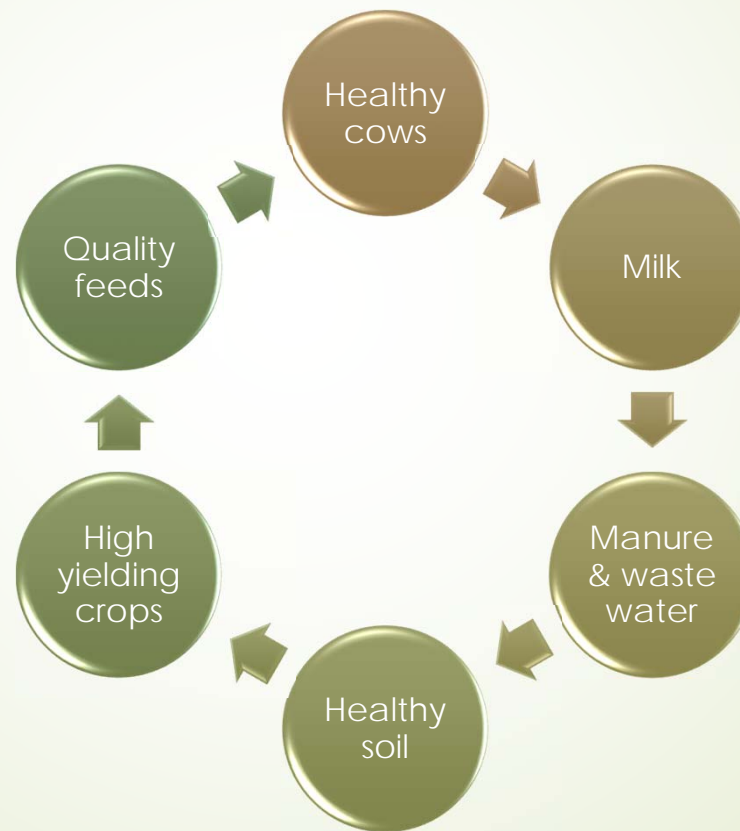
St. Johns, MI

Nobis Dairy Farm

- Acres Farmed 3300
- Acres Harvest 3750
- Cow number 1100
- 16 acres of runoff water contained
- Nobis Family purchased farm in 1947
- 334 acres-40 milk cows



Livestock and Cropping System



Evolution of a crop & livestock system

Bedding with sand since 1974

Last moldboard plow 1986

No-till, late 1980's

Weather pattern changed in '90's plus more cows. Resulting in less no-till, with a increase in minimum till.

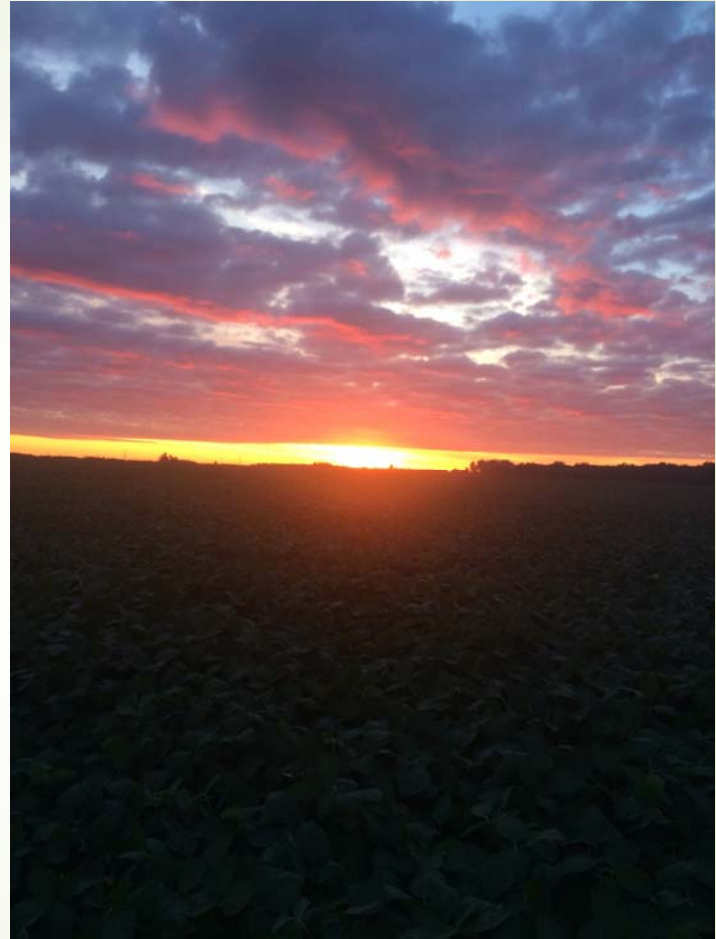
Closed loop sand separation system 2009

Recycle sand and water. \$100,000 worth of sand annually. Water first used for sand separation liquid portion irrigated on near-by fields

Solid portion of manure, moved to distant fields. Manure solids are a nutrient rich soil amendment.

Double crop - increases nutrient utilization, improves soil and increases harvested feed

Harvestable grass buffers allows trapped nutrients along drainage ditches to be utilized, grass mixture hay is harvested for feed, the thick grass buffer protects surface water.



Manure Management System

Manure Separation

- Liquid
- Solid

Options for covering land-base

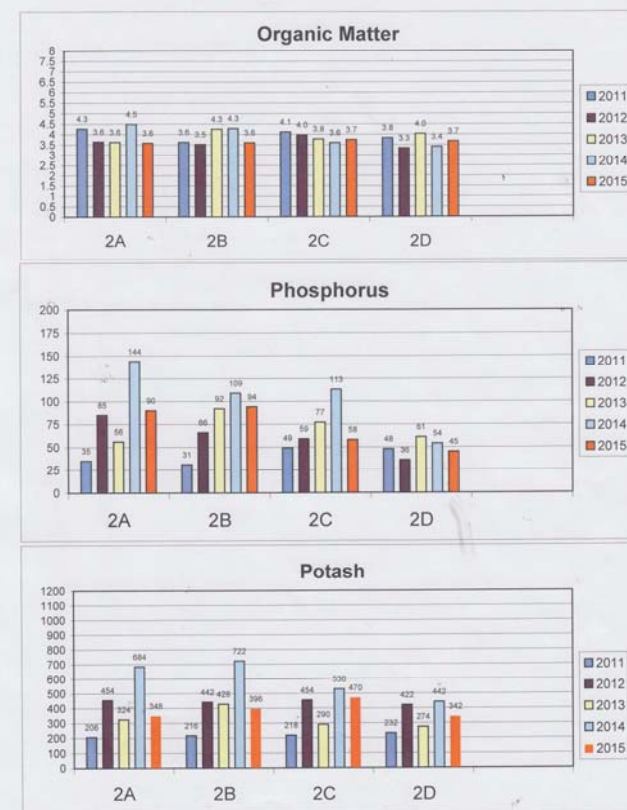
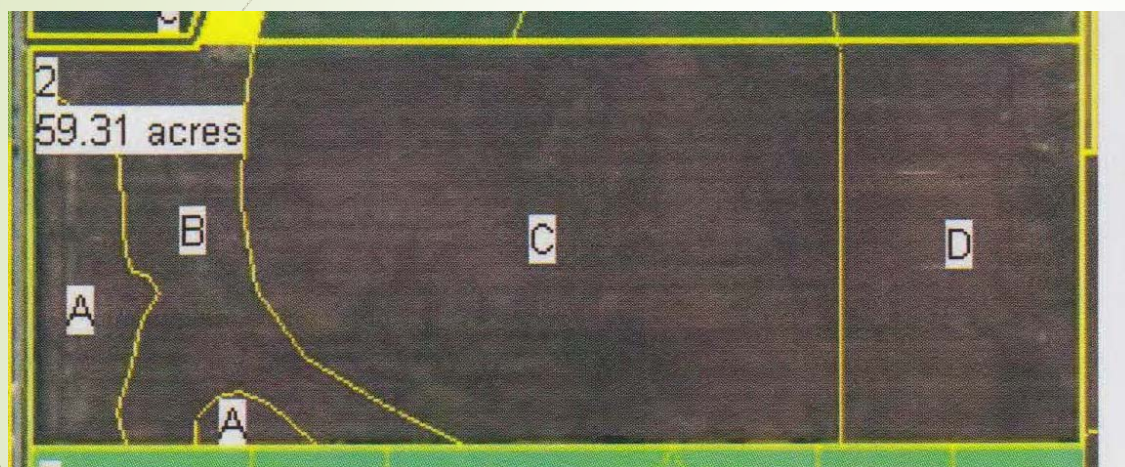
- Near the farm-liquid
- Hauling a distance-solids
- Winter spreading-approved fields-management practices in place-only solids-incorporate when possible

Managing Risk

- Harvestable buffer
- Double cropping



Soil Testing –annual test on fields receiving manure



Prepared by Dennings & Associates, Inc.



Manure Solids

>6,000 Ton/yr

Liquid Portion

20,000,000 gal/yr

16 acre
farmstead
runoff

12,000,000 gal/yr

Manure liquid

6,223,250 gal/yr

Gray water

1,460,000 gal/yr

Annual monitoring

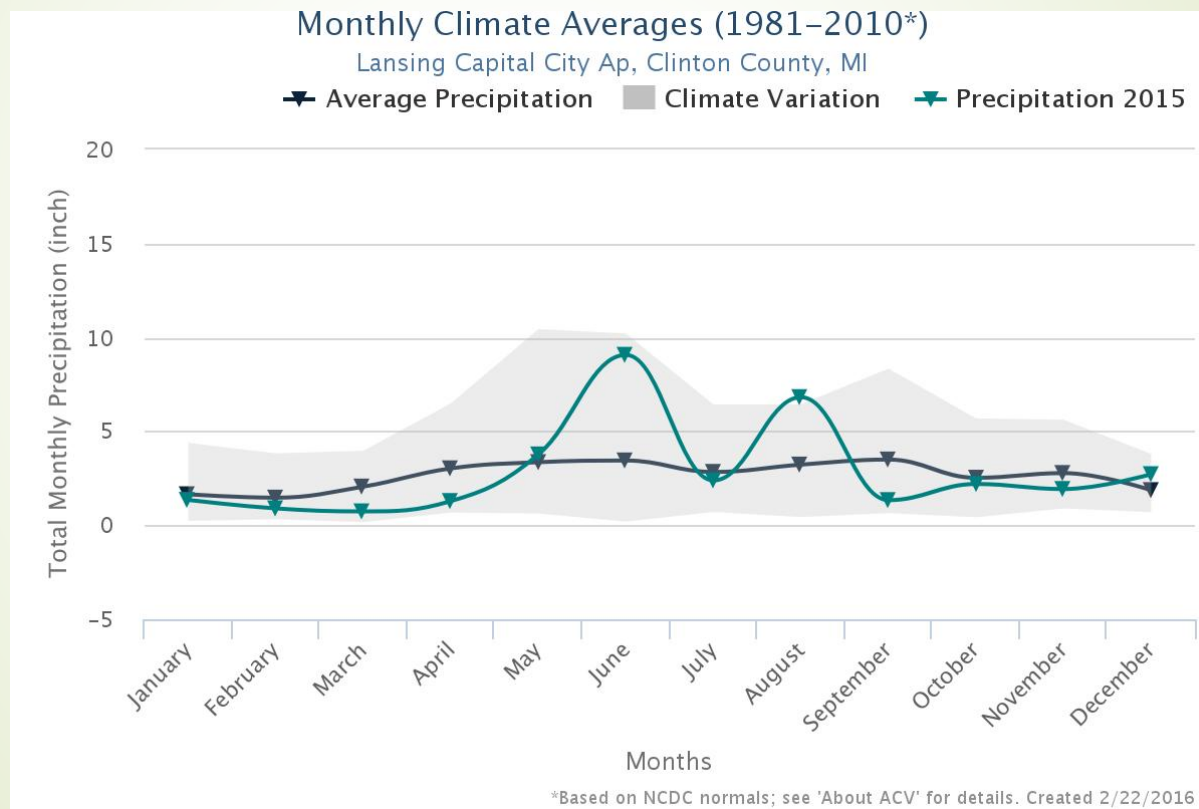
Manure Nutrients

Manure Source	Total N	P2O5	K2O
Liquid Portion Gray water & runoff (lbs/1000 gal)	8.6	2.19	9.25
Manure Solids lbs/ton	5.69	2.82	10.95

Crop Removal (3 year ave.)

Crop	Yield	Total N lbs	P2O5 lbs	K2O lbs
Corn Silage	27 T	254	97	211
Corn	190 bu	171	66.5	51
Soybeans	55 bu	209	48	77
Alfalfa	8 T	360	80	360
wheat	110 bu	132	68.2	41.8
Wheat Straw	2 T	26	6.6	46
Forage Oats	2 T	80	25	90

Rainfall's impact on nutrient analysis of liquid portion





2 years...

Manure provides....

- 344 # nitrogen
- 87.6# phosphorus

Still need to add...

- 148# nitrogen
- 128.6# phosphorus

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Living roots 79% of 2 year rotation!



Soil health

- High crop yields
- Double cropping
- Manure
- Minimize tillage
- Narrow rows
- Soil ph
- Balance of nutrients
- Good mgmt. practices



Harvestable Buffers



By the numbers...

- 60-70 acres on farm
- 60 average buffer width (ft)
- 10 years using practice
- 3 cuttings/year

Management

- N at green up
- N after 1st cutting
- August 15 last cut to allow for regrowth



Uses

- 1st cut haylage for heifer feed
- 2nd & 3rd cuts small squares for fresh p



Grass Mix

- 25% Orchard grass
- 25% Timothy
- 25% Perennial Ryegrass
- 25% Brome grass



Protecting the water

- Traps sediment
- Crop Removal



Phosphorus Levels (ppm)		
	Field	Buffer
North	17	33
South	39	32



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Reducing Risk

Buffer traps sediment from winter & early spring water movement.



Buffers Benefits

- Trap sediment
- Trap nutrients
- Mark boundary for herbicide appli.
- Mark spreading boundaries
- Provide feed
- Remove nutrients
- Look nice



High Yielding Crops





Conclusion

No need to break the bank to have healthy soil.

You can have healthy soil using practical low cost management practices

I remember my Dad saying in the 1980's that the soil on our farm was healthier and more productive than it was in 1947. I report to you that our soil has seen continuous improvement over the years. It is a goal.

Healthy soil is fun to farm

