Comments and Considerations

for the

EPRI N2O Offset Protocol

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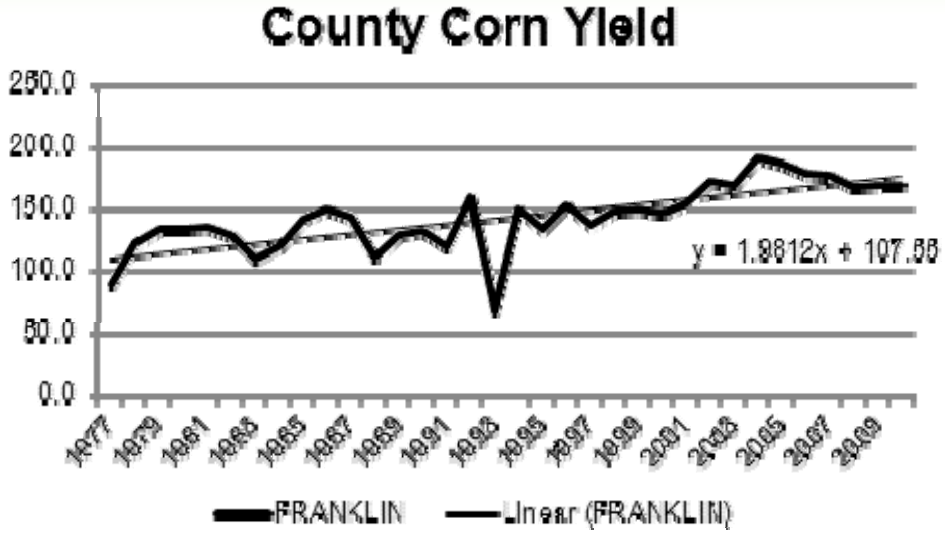
General Comments

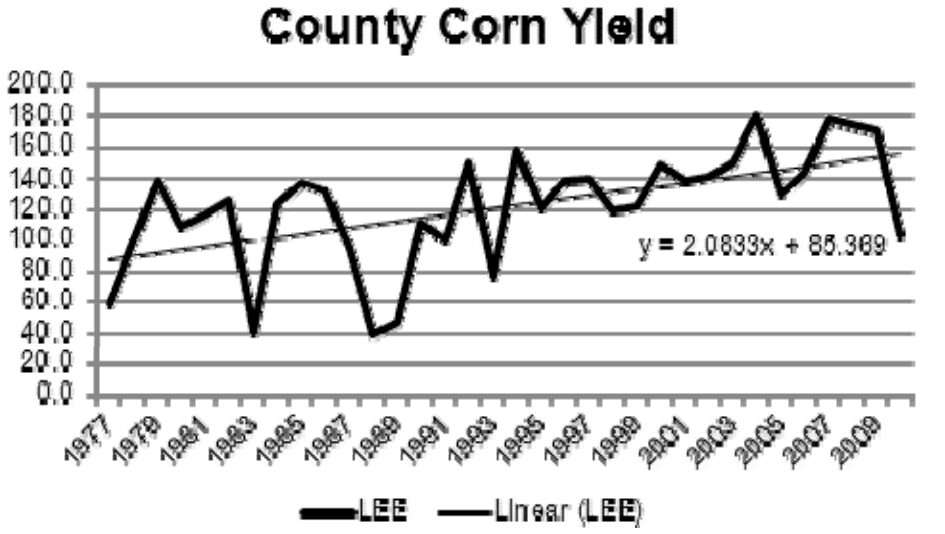
- Simple design
- Reasonable data requirements
  - Assuming simple farm records are sufficient
  - Verification audits
- Protocol parameters

Issues

- Protocol Parameters
  - Yield variability
  - Yield trend adjustment
  - Land inclusion stability
  - Accounting for manure
  - Nitrogen to Corn price ratio stability
    - How sensitive is the MRTN to a change in the price of corn?
    - Last year corn ranged from $3.50 to $7.00

Yield Variability





- 1/3 of the time, county yields will be more than 5% below 5-yr average
- Estimated that farm yield deviation is more than 40% of the time.
- This variability is with relatively stable N application

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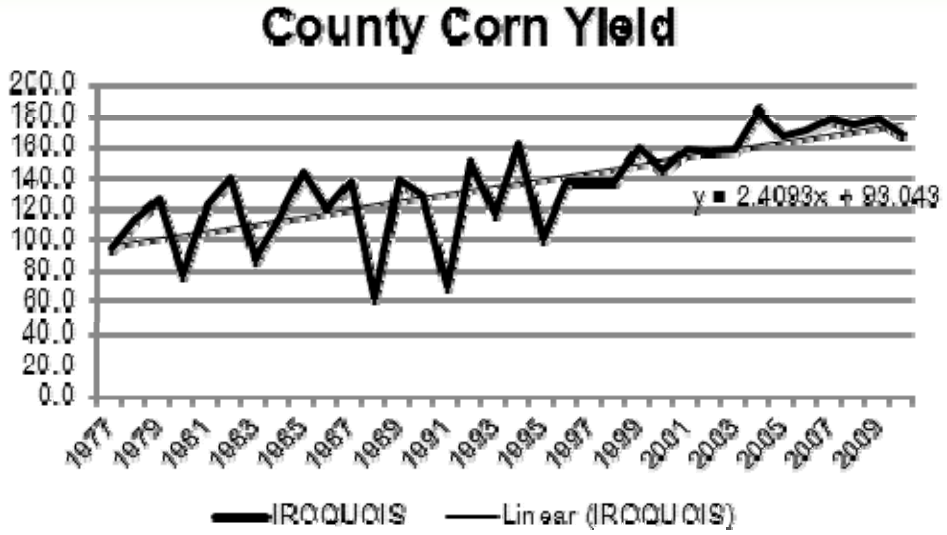
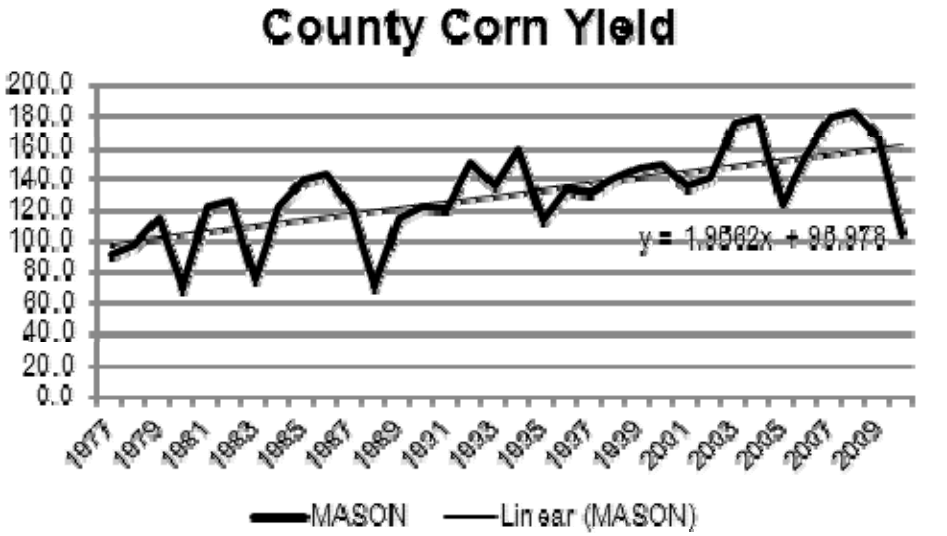
Yield Trend





- Adjustment for yield trend.
- With 2 bu yield trend, 5-yr average already lags current yield by 3% to 5%

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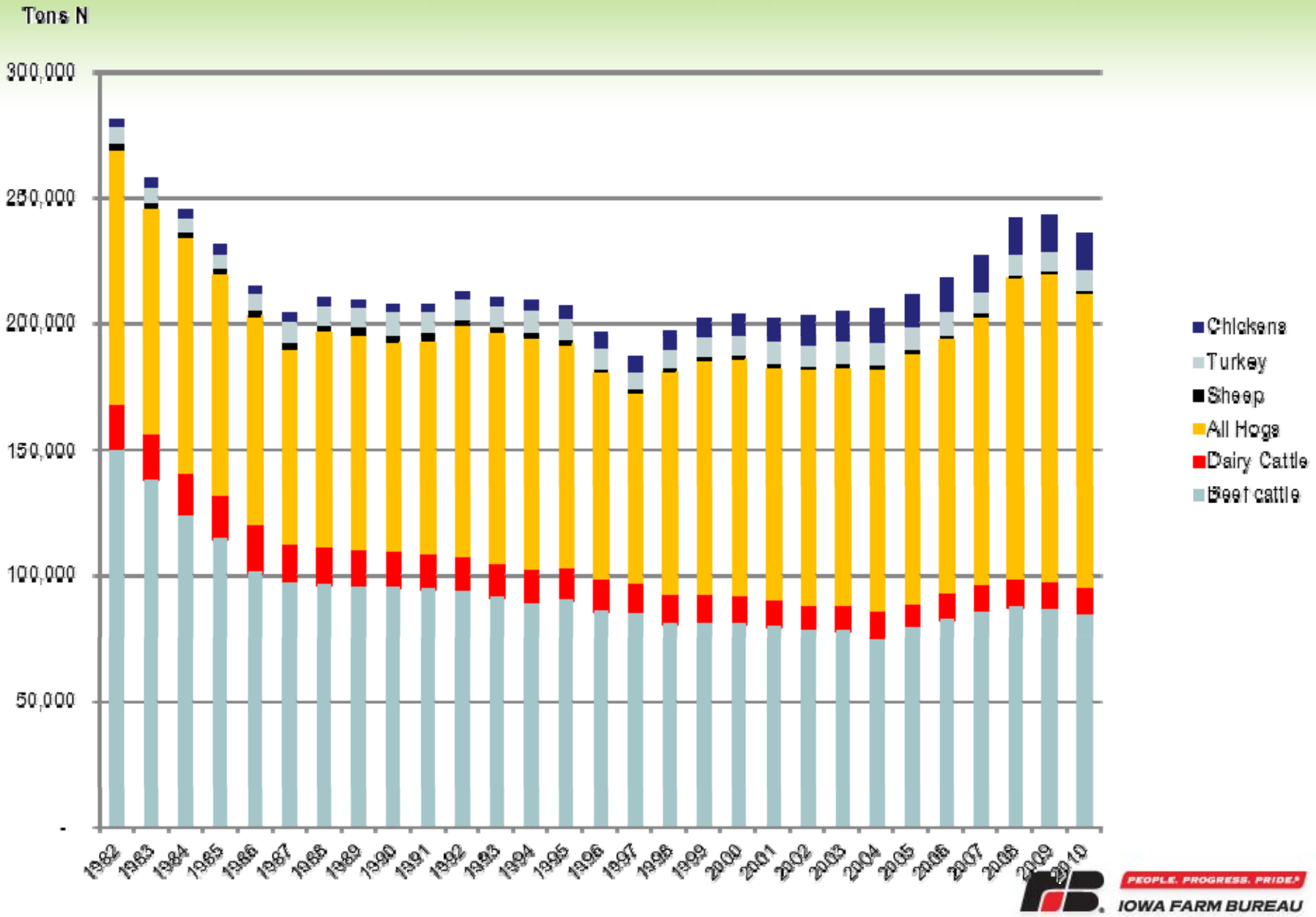
Iowa Manure N Sources
1982 - 2008



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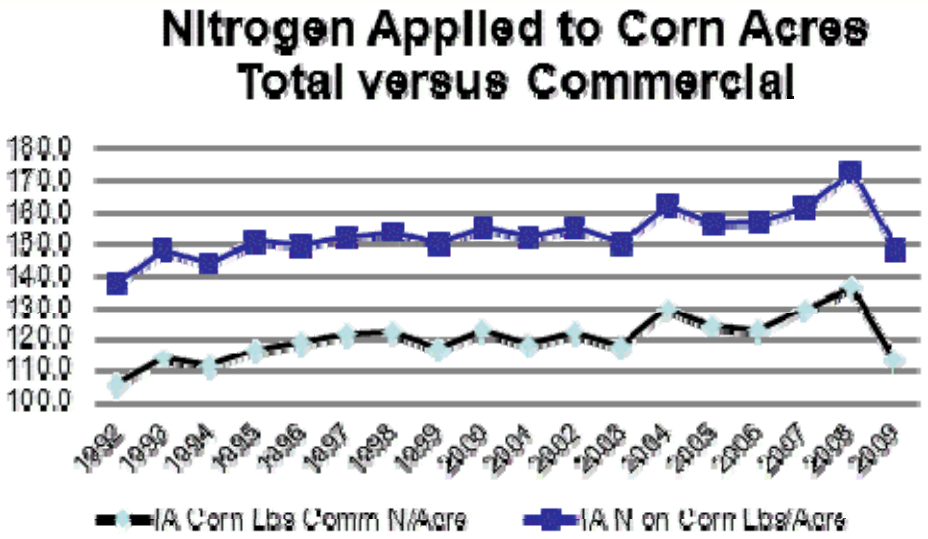
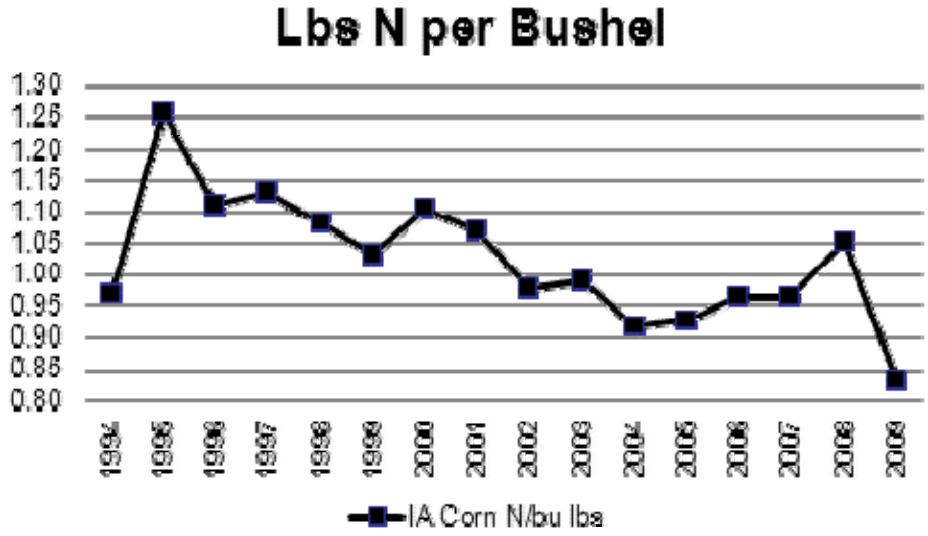
Nitrogen Use





- N per acre is increasing, but total N per acre in Iowa (including manure) peaked at 170 lbs per acre. And, about 22% of the total N in the state is from manure.
- N use efficiency was improving until 2005. Recently, higher corn prices have stimulated increased N application per acre. But this increased N use may be quite economical. See how N use declined with the decline in corn price for 2009.

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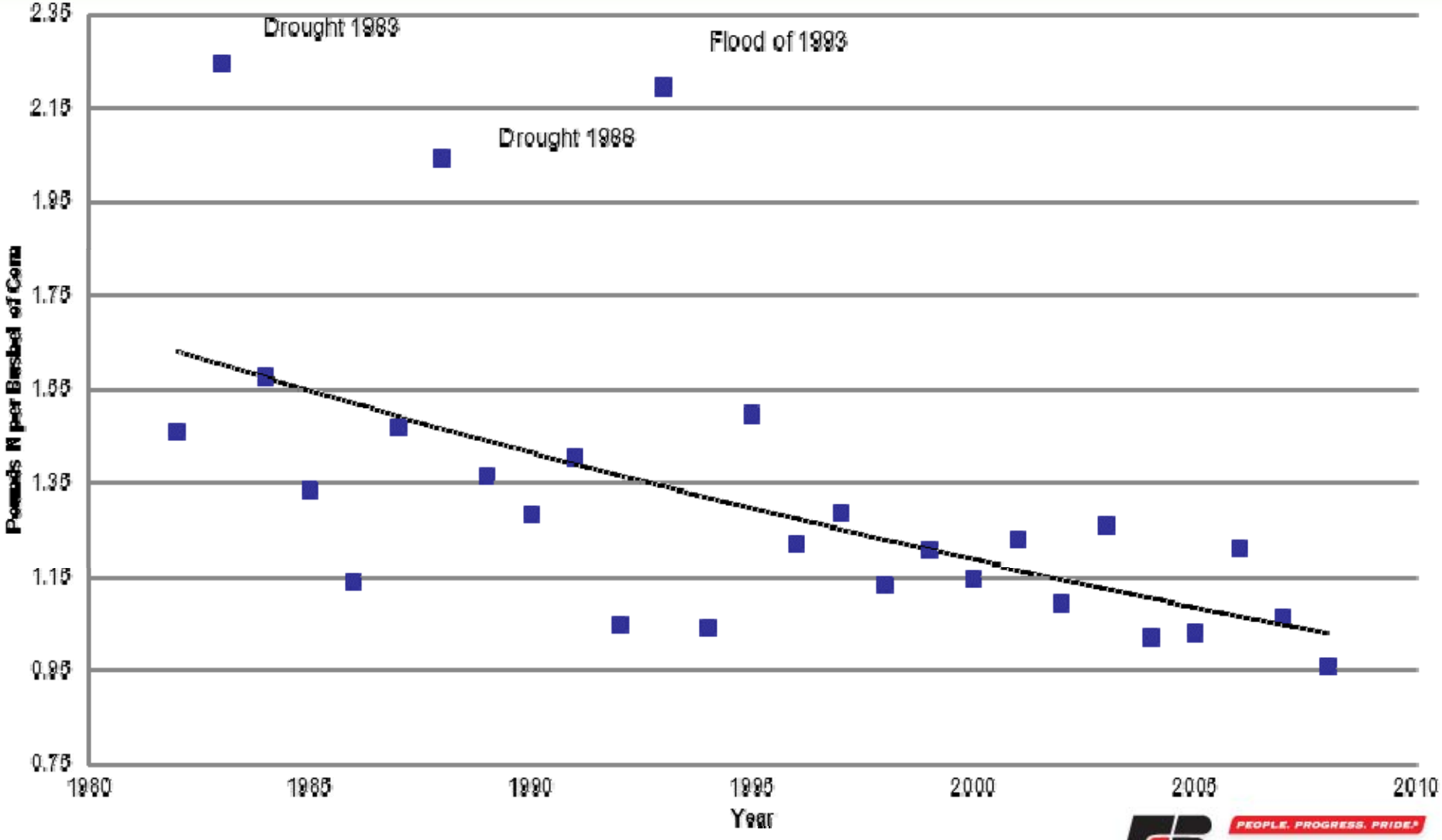
Total Nitrogen per Bushel Purchased & Manure Iowa Corn 1982 - 2008



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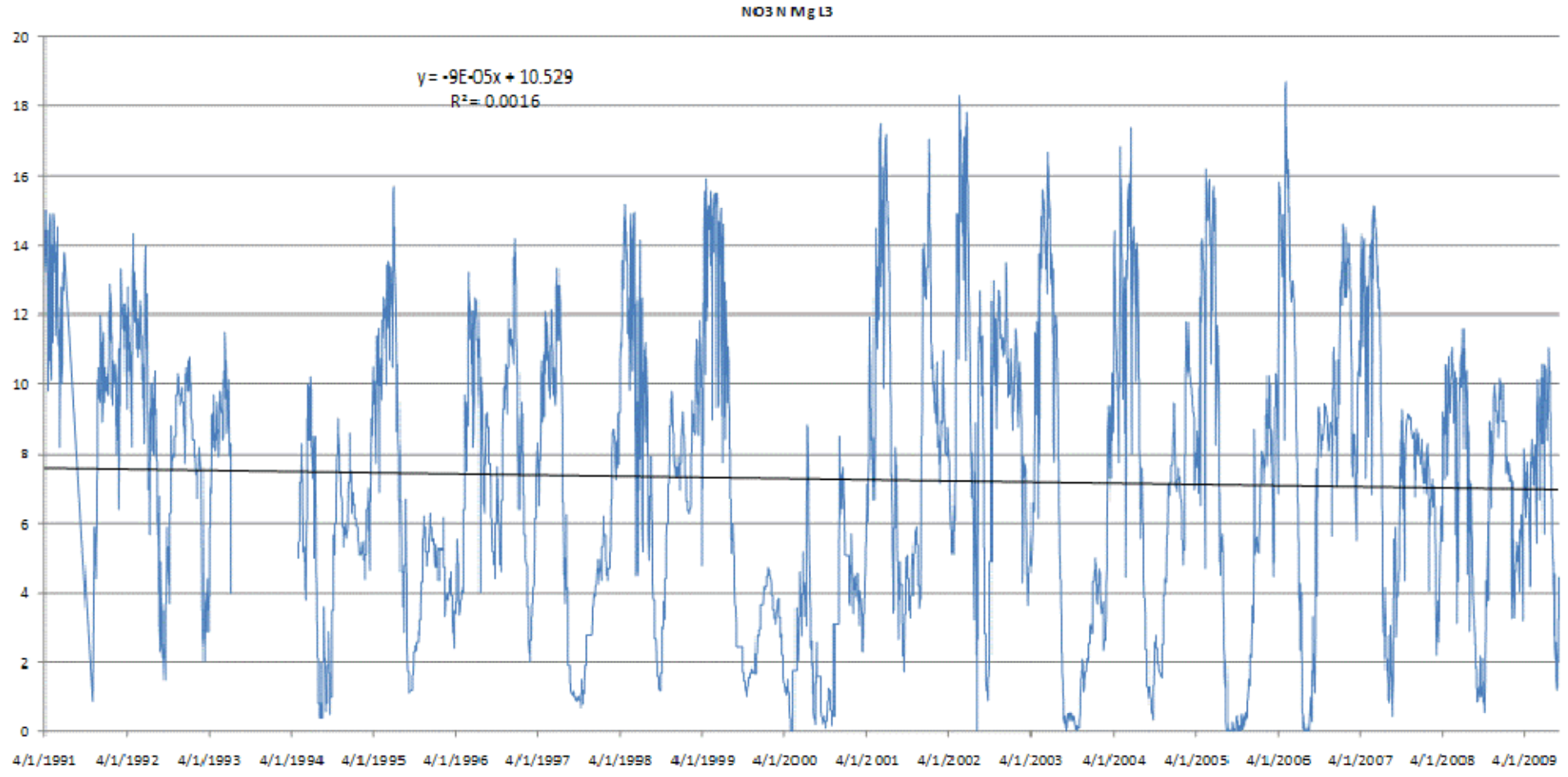
Raccoon River N concentration

Since 1991



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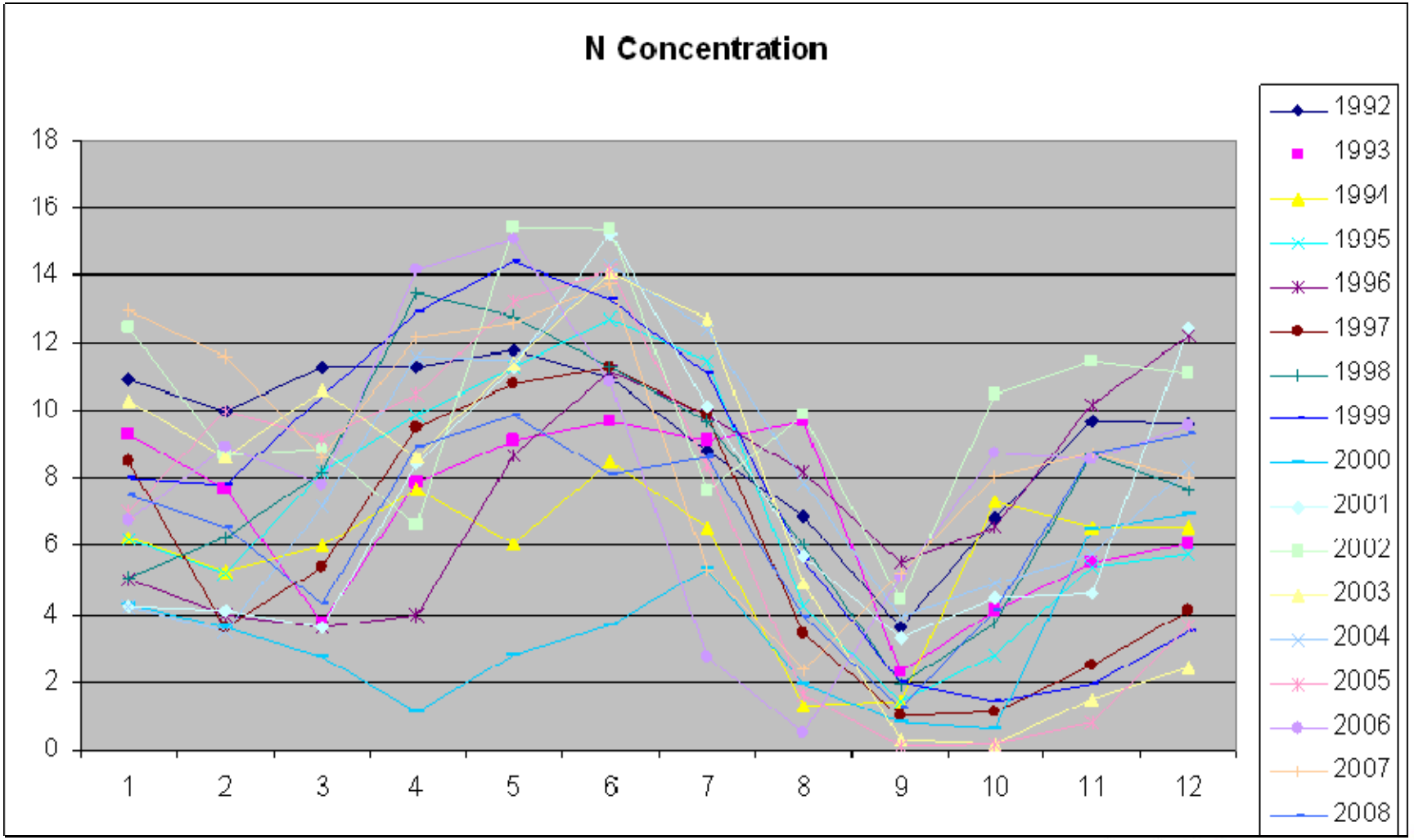
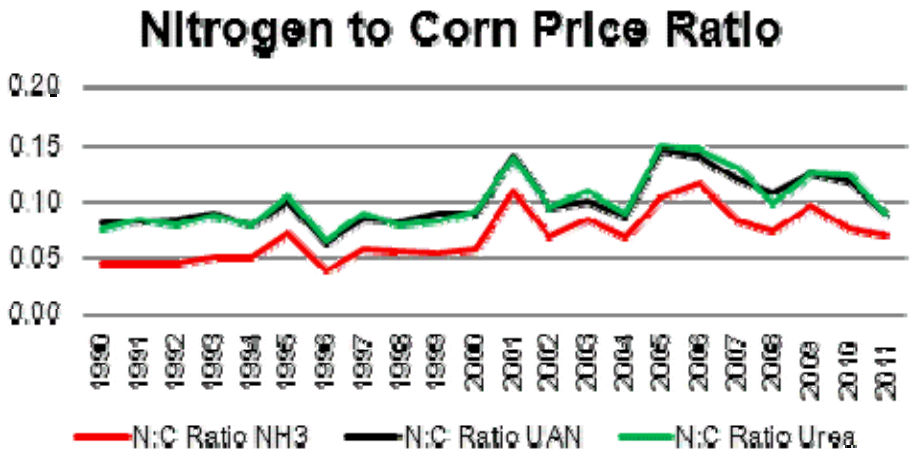
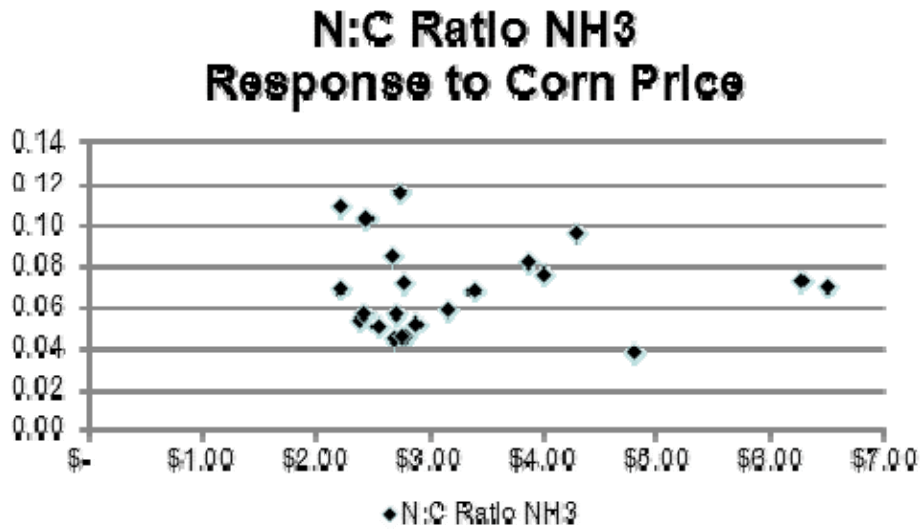
Raccoon River N concentration Seasonal Pattern

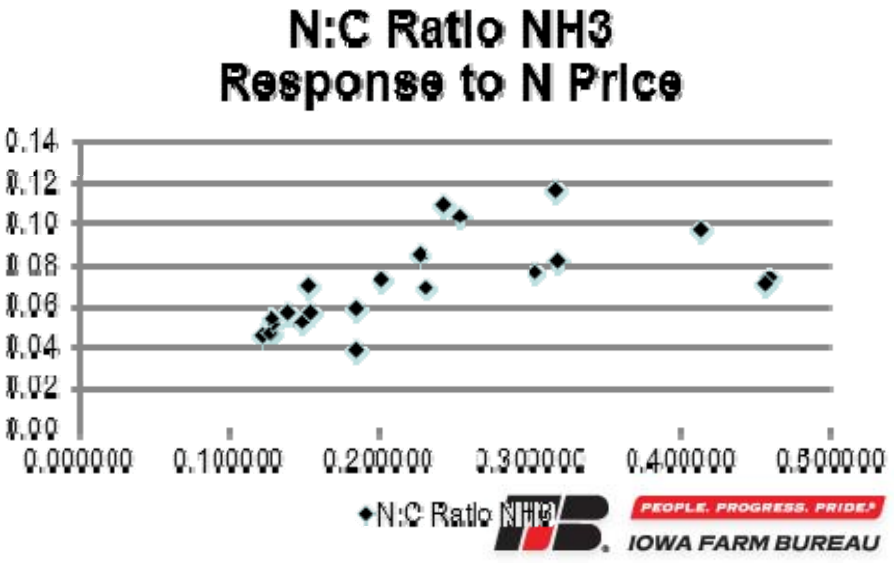


Nitrogen to Corn Price Ratio



- The ratio of the price of nitrogen to the price of corn is somewhat stable over time, but has been slightly increasing over time making N fertilizer more expensive on a relative basis compared to corn.





Is it worth It?

In Franklin County Iowa, a 20% reduction in N application (167 lbs/acre to 133 lbs/ac) only generates 0.16 mt of CO_2 eq per year.

On a 1,000 acre farm with 500 acres of corn, this is 80 credits per year.

At $20 Carbon & $5 corn, if average corn yield declines by 2.64 bu/ac, then there is no net value to the farmer even if administrative costs are zero and accounting for reduced N costs.

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Aggregation Issues

- Verifiable records & audits
  - N inputs; Production;
    - Farm versus field records
    - Tax & Crop Insurance records
    - Cash accounting versus accrual records
- Carbon market stability
- Aggregation model
  - Build it & they will come?
  - Forward contracts?

Thank You

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