BMP CHALLENGE ™ :
Yield and income risk protection for corn farmers who adopt water quality BMPs

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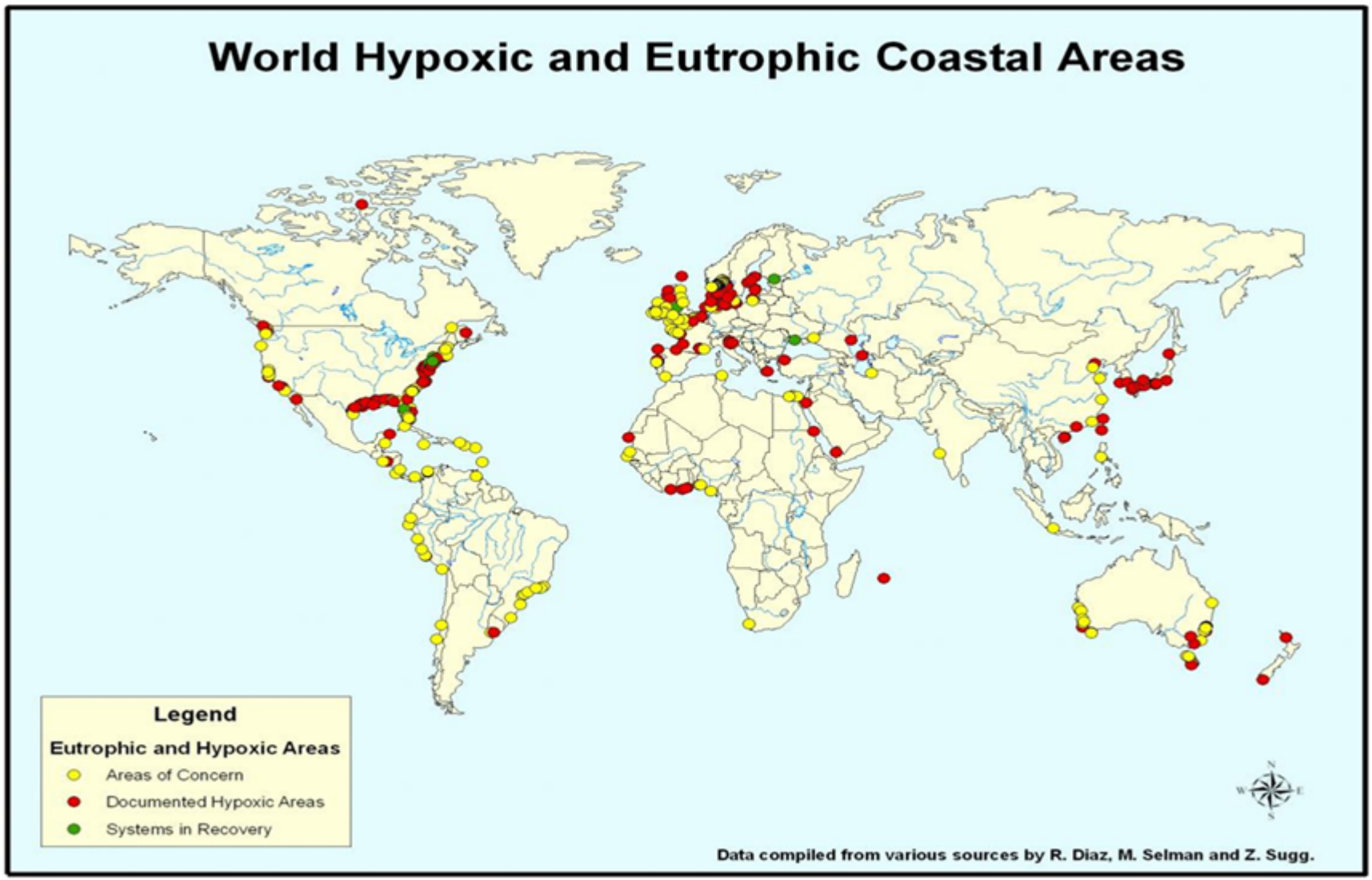
Presentation Objectives

- *Water Quality: Global & Local*
- *The INPUT PARADOX*
- *What is BMP CHALLENGE?*
- *BMP CHALLENGE in PA*
- *Results from the field*
- *Next steps to SCALE UP*

Water Quality Stewardship…



Mill Creek

PA's Nutrient Reduction Commitments

- A lot has been done
  - Through 2006, PA reduced nitrogen loadings to the bay by 25.8 M lbs. (45 % of goal)
  - PA farmers responsible for more than half of all N reductions in the multi-state watershed
- A lot more to go
  - 32 M lbs left to go
  - 25 M lbs from farmlands
  - With more than 40,000 farms, that averages to about 600 lbs of reduction per farm.

Best management practices that work for production agriculture are a necessary part of the answer!

Barriers to adopting BMPs

- High initial capital cost
  - **State and Federal cost share $**
- Technical knowledge of practice, installation and maintenance
  - **Technical Assistance (state, federal, county, non-profit)**
- Potentially lower income from production loss.
  - **?????**

Input paradox?

EPA, National Academy of Sciences and more than 20 other studies identify ECONOMIC RISK as a major barrier.

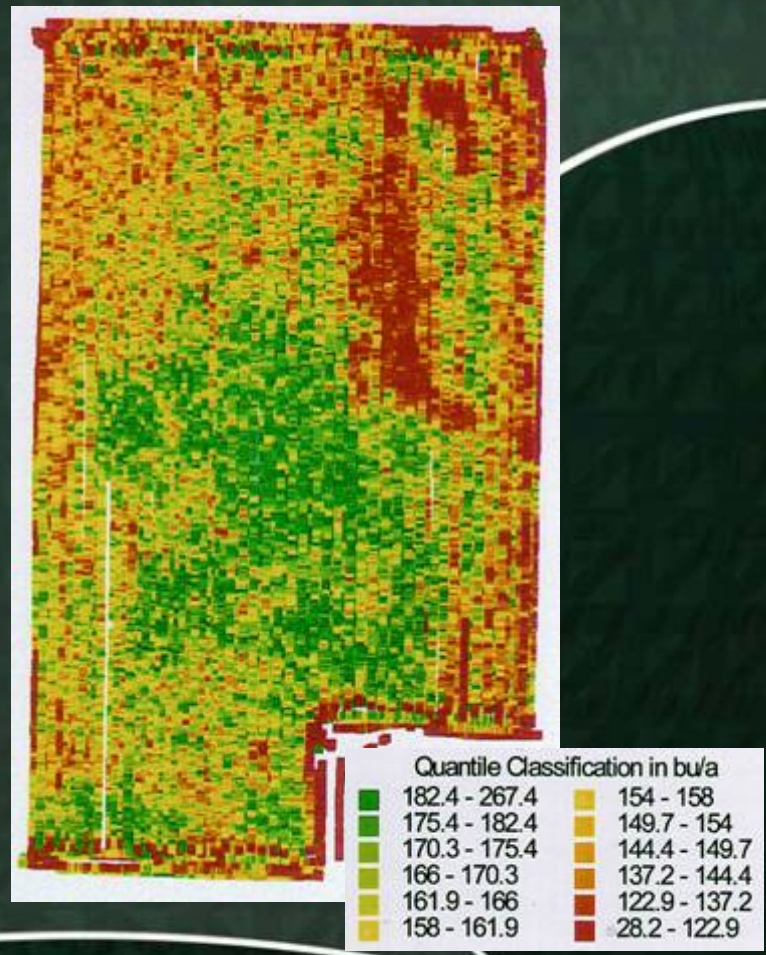
"We've used a crop consultant in the past…

…if he's wrong, the cost of him being wrong is much more than the cost of that additional insecticide or herbicide."

“EXTRA” is a RATIONAL DEFENSE

Against economic uncertainty

- ***Nutrient mgt is an uncertain science - 1.2# N/bu no longer***
- ***Nutrients may be lost if heavy spring rains occur or unavailable during droughts***
- ***Bumper crop conditions may call for more nutrients***



2005 corn farmer survey

- 700 farmers, each planting 850 acres of crops per year on average
- Some progress
  - 54% have reduced fertilizer over past five years, 18% by 15% or more
- Enormous potential for basic and advanced practice adoption
  - 16% do not credit N from soybeans
  - 25% do not credit nutrients in manure
  - 67% do not use variable rate
  - 88% do not use in-season testing/application

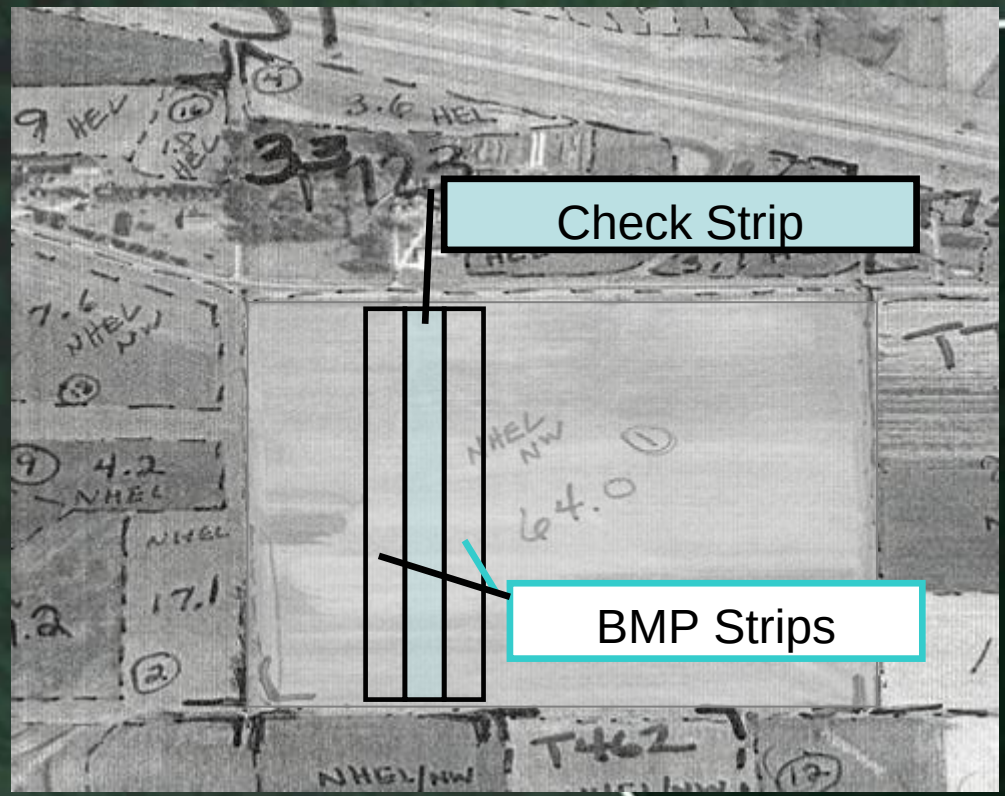
2005 corn farmer survey

- 46% want to see proof before changing practices
- 80% would be interested in reducing fertilizer rates if income were guaranteed

ENTER THE…

BMP CHALLENGE: Mechanics

- Farmer enrolls field(s)
- Crop advisor prepares recommendation (nutrient, tillage)
- Farmer applies traditional practice to check strip. New practice on rest of field
- Farmer and crop advisor assess yield v. adjacent
- Farmer paid if loss in profit based on Net Returns Analysis



Net Returns Analysis

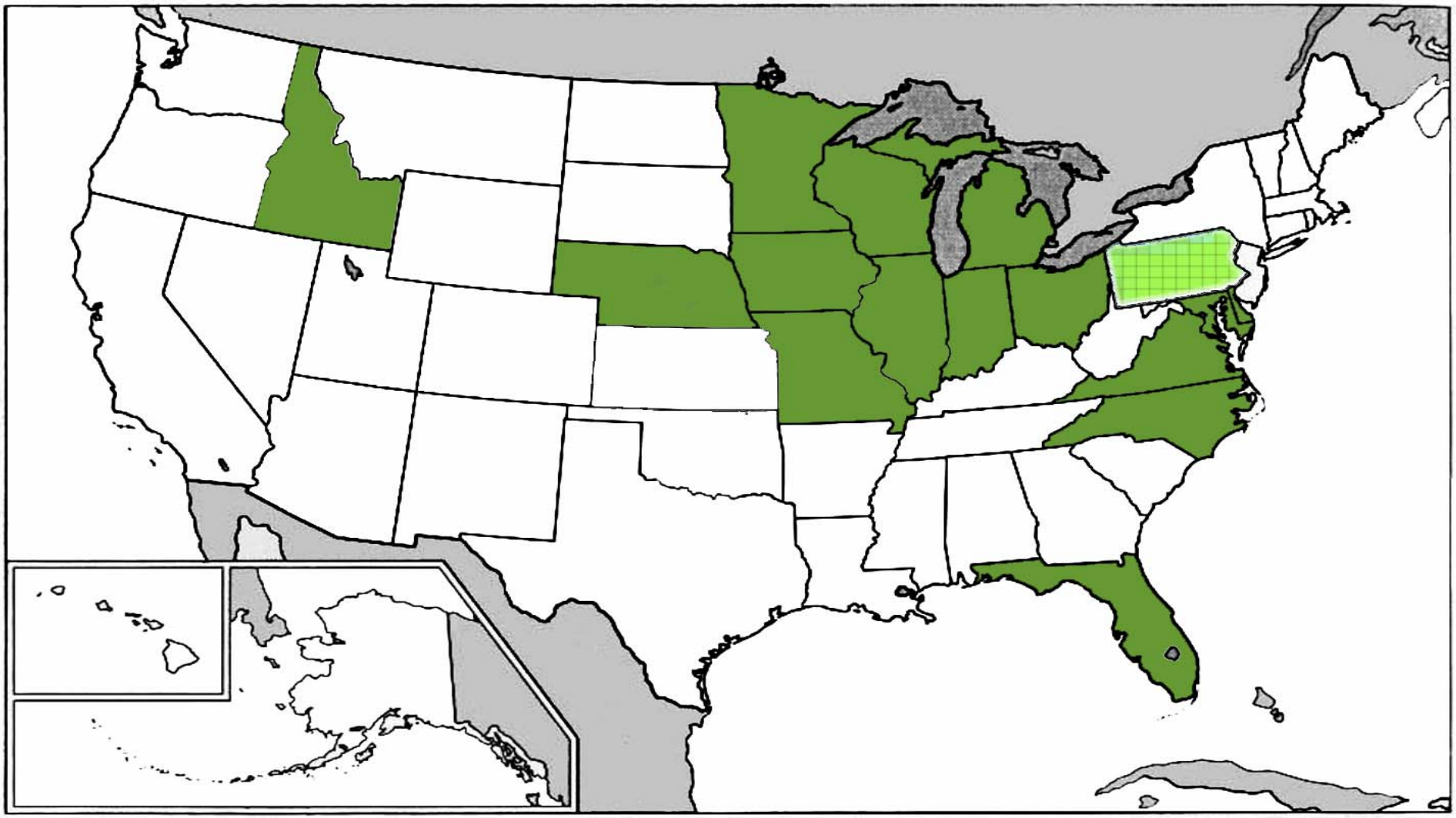
- Calculate gross returns for check strip and BMP strips using RMA-APH corn price
- Subtract fertilizer or tillage costs from gross returns to calculate net returns
- If net returns to BMP are negative, farmer receives guarantee payment equal to the difference
- If net returns to BMP are positive, farmer contributes 1/3 of savings back to BMP Challenge program

BMP Challenge Participating States

Conservation Tillage and Nutrient Reduction

= BMP Reccomendations

< BMP Reccomendations



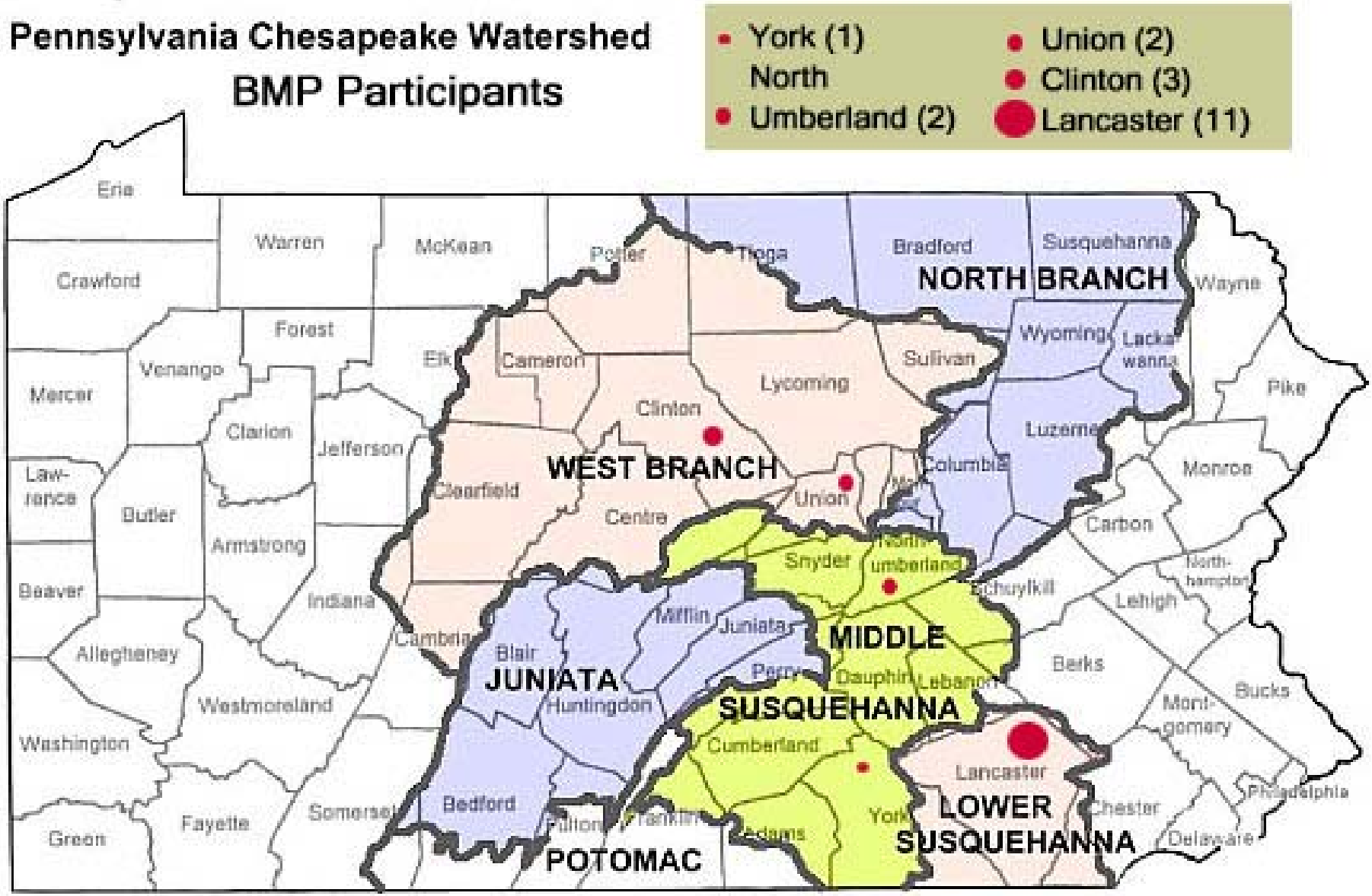
Enhanced Nutrient Management

- 2008 CIG funded project initiated in 2005 to work with corn farmers in the Chesapeake Bay Watershed (PA, MD and VA) to test methods to reduce nutrient applications without negatively affecting the economics of farming.

- The project provides a **yield guarantee** and **incentive payment** for farmers reducing fertilizer applications 5% – 15% below current recommendations
  - Meets baseline requirements for trading

Pennsylvania Chesapeake Watershed

BMP Participants



Enhanced Nutrient Management Results 2006
CORN FOR GRAIN

Check strip yield (bu/acre)	BMP strip yield (bu/acre)	Net return	Fertilizer Savings per acre	Payout per acre	Total payment	N # check strip	N # BMP strip
95	75.9	($35.02)	$7.00	$35.02	$2,594.98	160	140
196.9	184	($17.88)	$10.50	$17.88	$1,966.80	200	170
178	173	($2.60)	$8.40	$2.60	$65.00	160	136
153.4	142.6	($15.01)	$8.75	$15.01	$750.50	165	140
230	220.9	($9.87)	$10.15	$9.87	$611.94	193	164
113.6	113.3	$8.09	$8.75	$0.00	$0.00	165	140
79.4	71.2	($9.29)	$8.75	$9.29	$315.86	165	140
132.5	99.3	($64.29)	$8.75	$64.29	$5,593.23	150	125
113.5	108.2	($2.91)	$8.75	$2.91	$436.50	150	125
175.8	168.5	($7.66)	$8.40	$7.66	$532.75	160	136
120.1	105.5	($21.62)	$10.50	$21.62	$2,726.28	180	150
114	77	($72.30)	$9.10	$72.30	$4,779.03	176	150
237.6	197	($78.82)	$10.50	$78.82	$11,823.00	200	170
149	134	($25.32)	$9.10	$29.87	$32,195.88	171	145

Enhanced Nutrient Management Results 2007
CORN FOR GRAIN

Check strip yield (bu/acre)	BMP strip yield (bu/acre)	Net return	Fertilizer Savings per acre	Payout per acre	Total payment	N # check strip	N # BMP strip
101.0	67.1	($108.23)	$10.35	$108.23	$16,235.15	150	128
222.0	217.0	($4.00)	$13.50	$4.00	$428.00	180	153
217.7	209.4	($15.55)	$13.50	$15.55	$2,332.50	210	180
182.3	187.0	$27.62	$11.25	$0.00	$0.00	198	168
187.5	181.0	($10.20)	$12.60	$10.20	$974.34	198	168
174.0	200.2	$104.75	$13.16	$0.00	$0.00	192	164
197.4	202.9	$31.55	$12.40	$0.00	$0.00	209	178
186.9	181.9	($6.41)	$11.20	$6.41	$474.47	182	154
168.3	170.6	$21.49	$13.50	$0.00	$0.00	180	150
185.7	177.9	($14.87)	$12.15	$14.87	$982.91	182	155
188.1	178.2	($22.46)	$12.30	$22.46	$3,368.66	200	170
162.9	144.3	($54.43)	$10.65	$54.43	$8,164.77	150	128
159.5	126.5	($104.94)	$10.65	$104.94	$15,741.32	150	128
181.9	171.0	($32.41)	$5.76	$32.41	$3,597.17	150	128
179.7	172.6	($11.98)	$12.09	$38.13	$48,702.11	183	156

Enhanced Nutrient Management Results 2006
CORN FOR SILAGE

Check strip yield (bu/acre)	BMP strip yield (bu/acre)	Net return	Fertilizer Savings per acre	Payout per acre ($/a)	Total payment	N # Check Strip	N # BMP Strip
19.4	13.4	($110.55)	$9.45	$110.55	$12,005.73	180	153
25.01	23.24	($24.20)	$11.20	$24.20	$3,702.60	210	178
22.65	22.43	$4.70	$9.10	$0.00	$0.00	175	149
26.88	23.89	($50.00)	$9.80	$50.00	$6,655.00	187	159
27.86	27.28	($2.85)	$8.75	$2.85	$427.50	175	150
24	22	($36.58)	$9.66	$37.52	$22,790.83	185	158

Enhanced Nutrient Management Results 2007
CORN FOR SILAGE

Check strip yield (tons/acre)	BMP strip yield (tons/acre)	Net return	Fertilizer Savings per acre	Payout per acre	Total payment	N # Check Strip	N # BMP Strip
23.93	21.67	($56.78)	$12.15	$56.78	$8,517.00	180	153
26.32	25.20	($20.86)	$13.30	$20.86	$3,129.00	210	178
24.95	24.34	($7.09)	$11.40	$7.09	$207.12	203	173
10.52	9.28	($26.40)	$11.34	$26.40	$3,960.56	196	167
21.4	20.1	($27.78)	$12.05	$33.00	$15,813.69	197	168

Enhanced BMP Challenge Results

- *Yield Results for PA Enhanced Nutrient BMP (15% below BMP)*
  - *Average for below BMP area*
    - *Grain = 154 bushels per acre*
    - *Silage = 21.2 tons per acre*
  - *Average for Check Strip (BMP rate)*
    - *Grain = 164 bushels per acre*
    - *Silage = 23.1 tons per acre*
- *Average fertilizer savings*
  - *15% or 27# N/acre*
  - *Average of nearly $11 in N savings*
- *Net Returns to BMP*
  - *Average net return = $(20.75)*
- **Guarantee Payouts**
  - **Guarantee payments for 30 of 36 fields**
  - **Total payment amount = $123,099.67**
  - **Average payment amount = $34.63/acre**

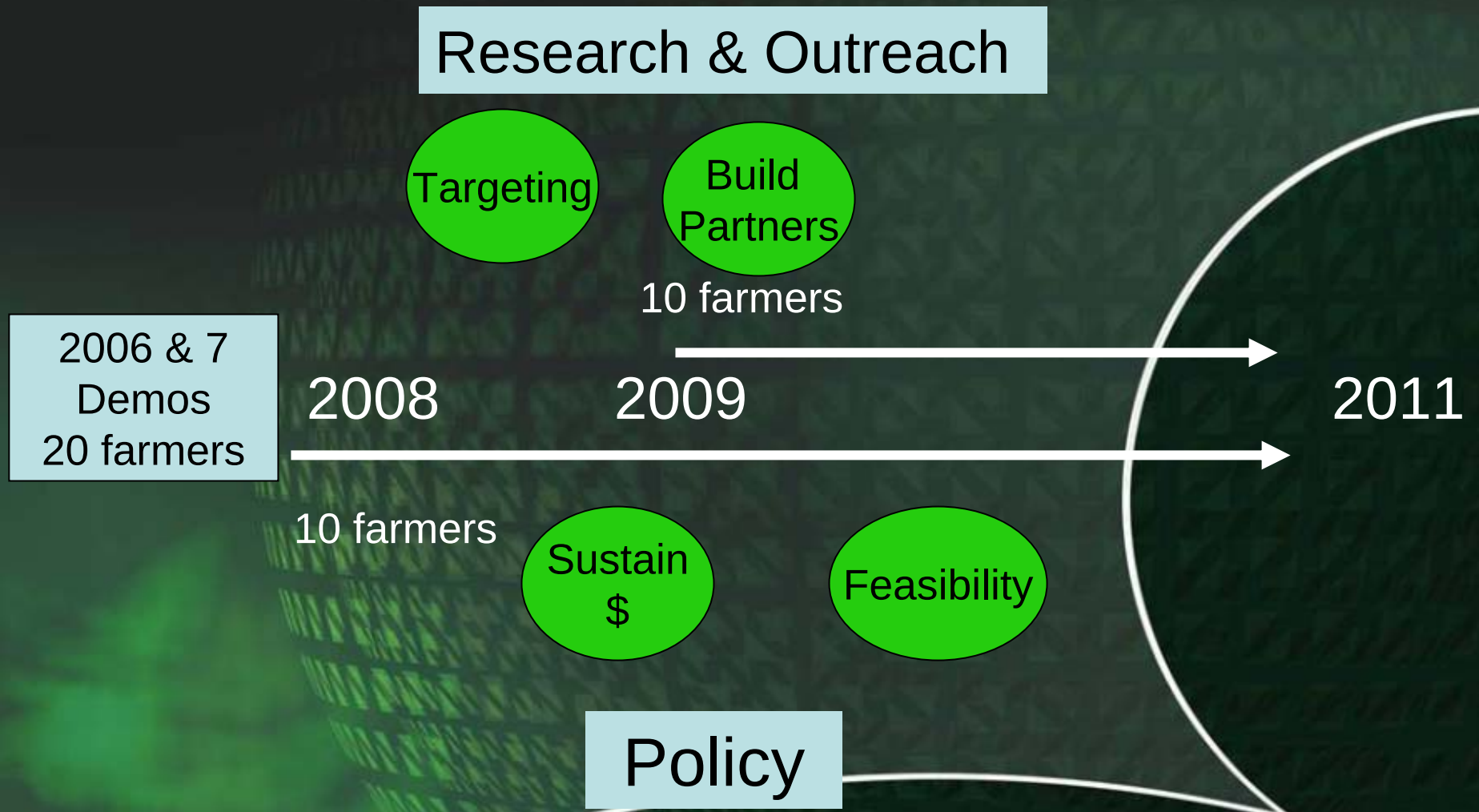
Enhanced BMP Challenge N Reduction Results

- Total lbs reduced over 2 years 96,227
- Ave. N reduction per acre 27 lbs
- Cost per pound of N reduction at field edge $ 2.98
- Cost per pound estimated by Chesapeake Bay Commission $ 4.41

Scaling Up

If the program expanded statewide to all 1.4+ million acres of corn, **Pennsylvania could meet one third of its nitrogen reduction commitment** under the Chesapeake 2000 agreement at a cost effective price.

Next Steps to Scale Up



Funding

NRCS Conservation Innovation Grant	**$650,000**
Growing Greener (2008)	**$50,000**
Growing Greener (2009)	$300,000
PA Ag Research Grants	$100,000
NY Community Trust	$25,000

AFT's Project Partners