

Performance-based Incentives for Agricultural Pollution Control 2007 National Water Conference



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Can we improve water quality, farm viability, and the cost-effectiveness of agricultural pollution control?

- How can we assist farmers to take the most cost-effective actions for water quality?
- Can we pay farmers to meet specific performance targets?
- Will this increase farm profitability while reducing nonpoint source pollution?

Overall Goals:

- Reduce nonpoint source pollution from agriculture
- Provide greater flexibility for farmers
- Induce innovation for pollution control
- Improve the cost-effectiveness of government spending

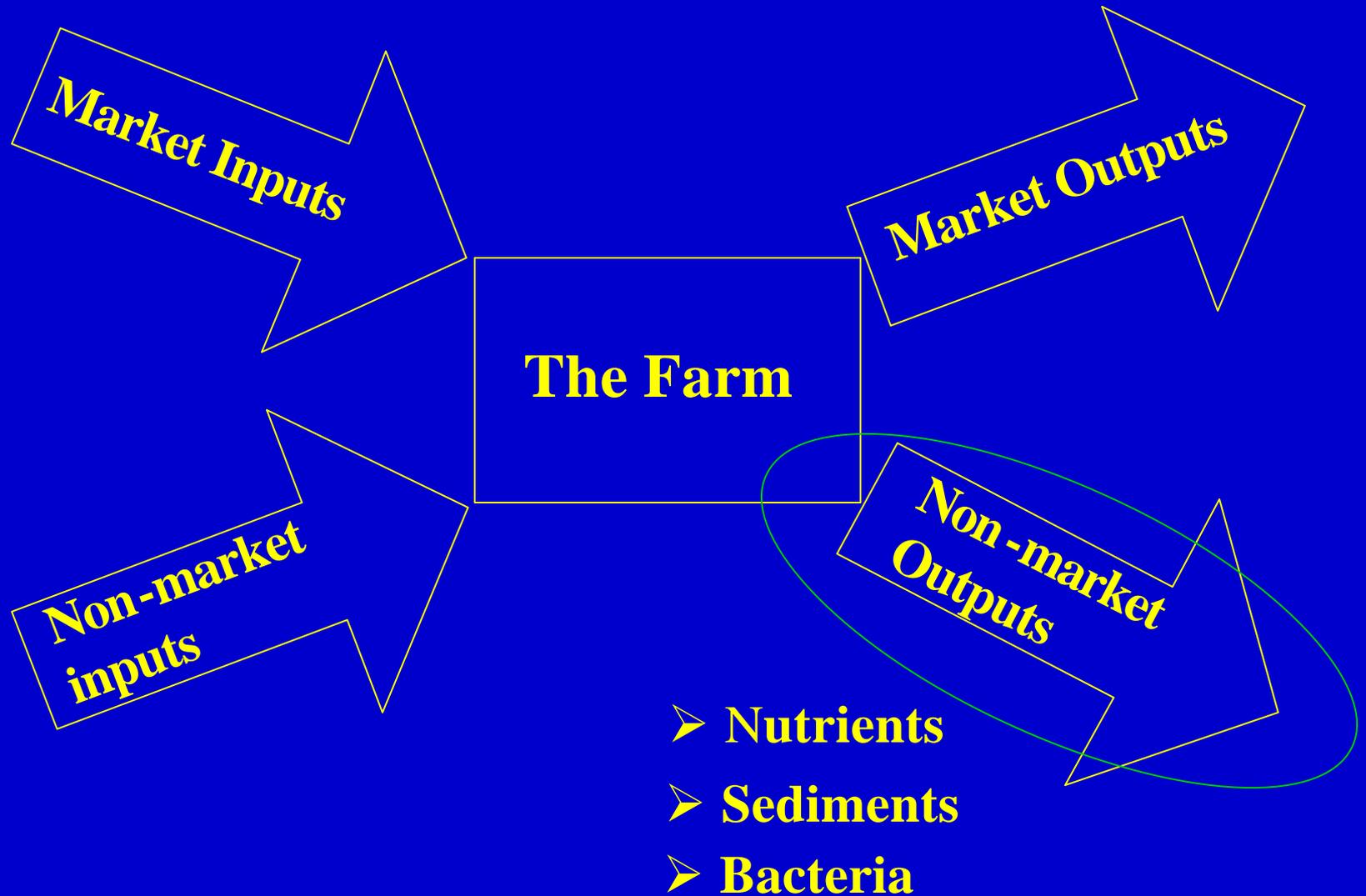
How Do We Get There?

- Link farm management decision-making to environmental outcomes through appropriately designed incentives
- “Internalize the externalities” of agricultural pollution

The Economic Justification

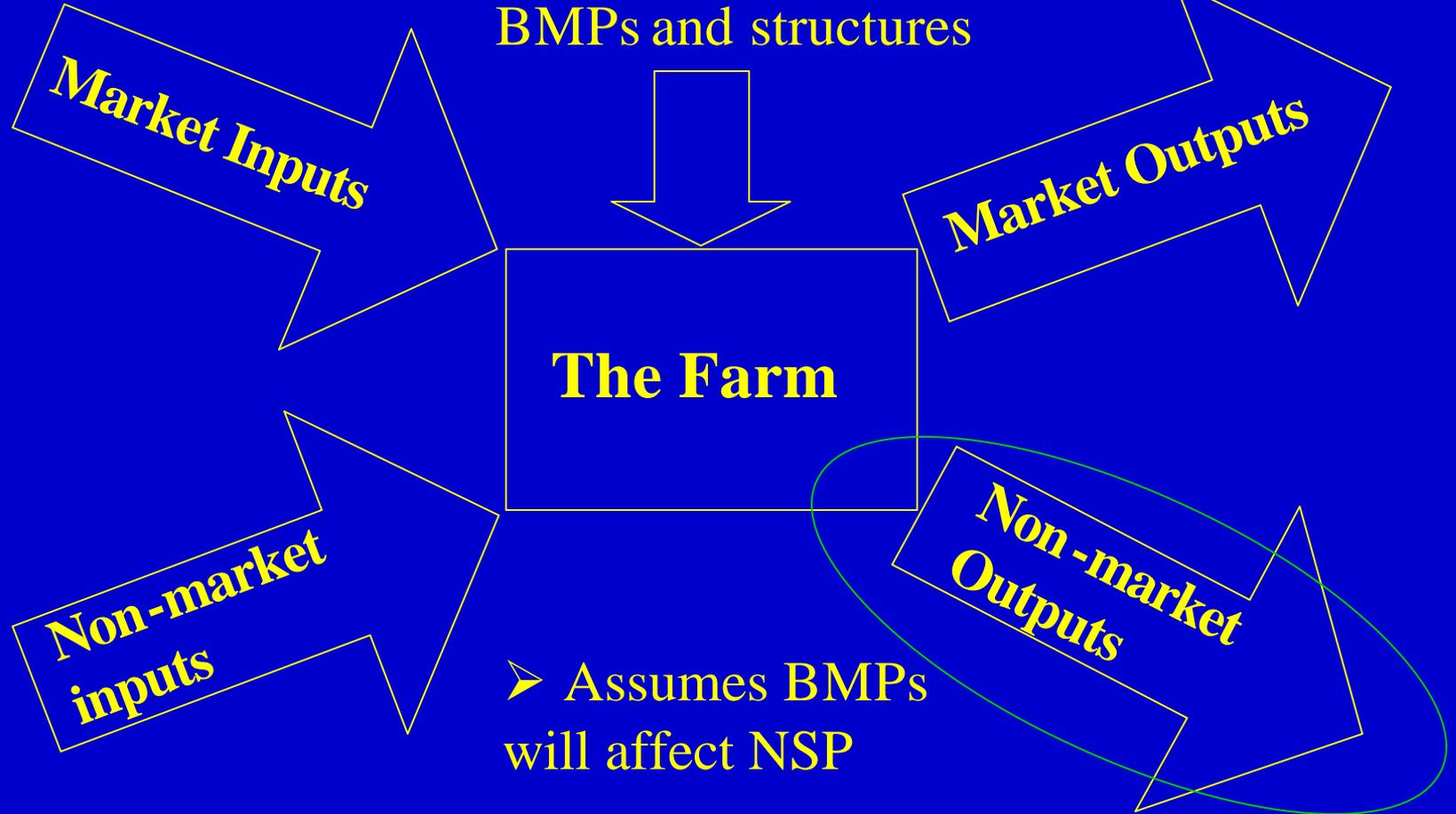
- There is no “market” for agricultural pollution control
- There is no real financial incentive for farmers to control NSP
- A financial incentive from policy can serve as a “price” for pollution control
- Environmental performance becomes incorporated into farm business planning

Farming and the Environment



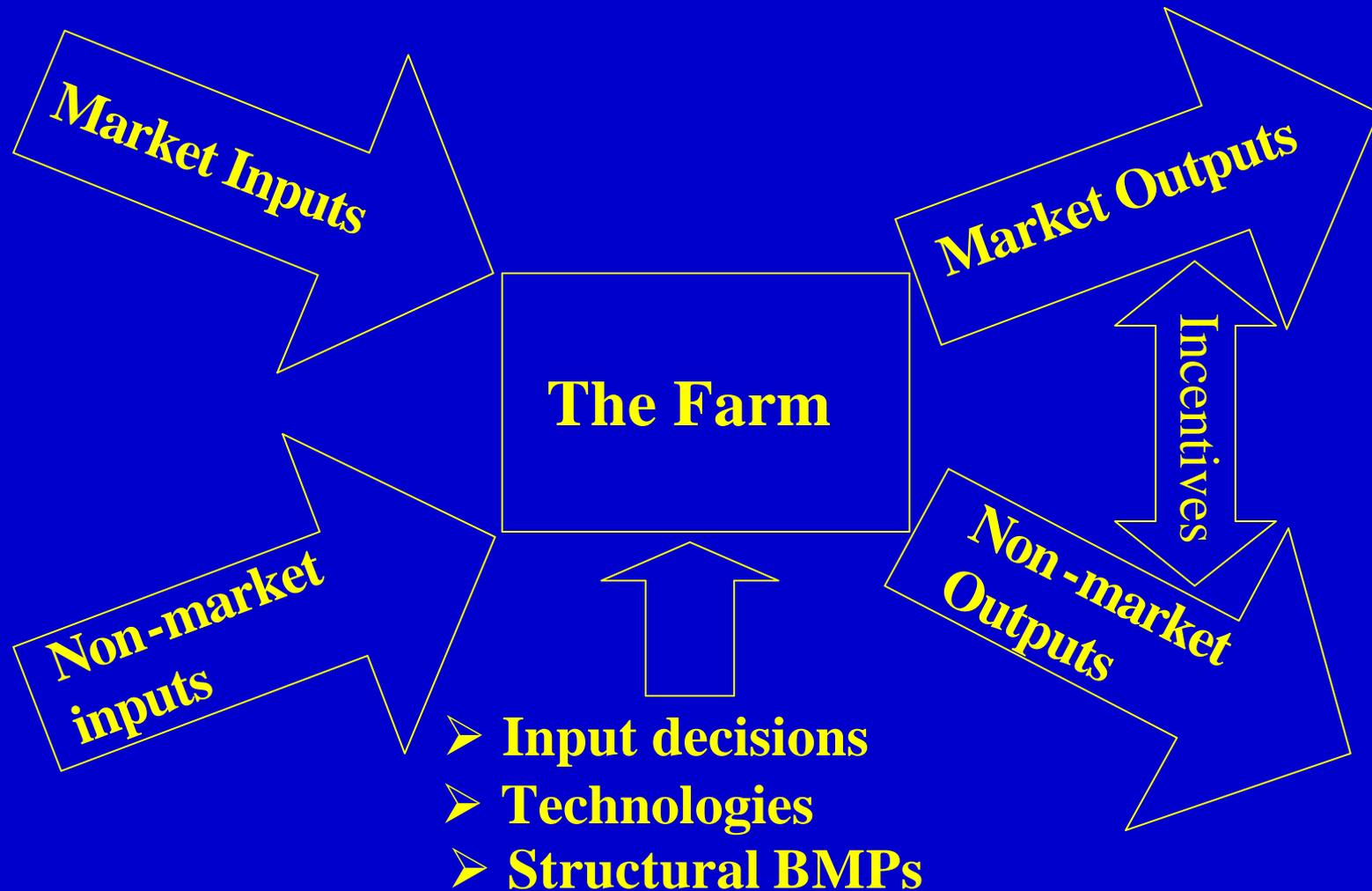
Current Policy Approach

Govt. cost-share of
BMPs and structures



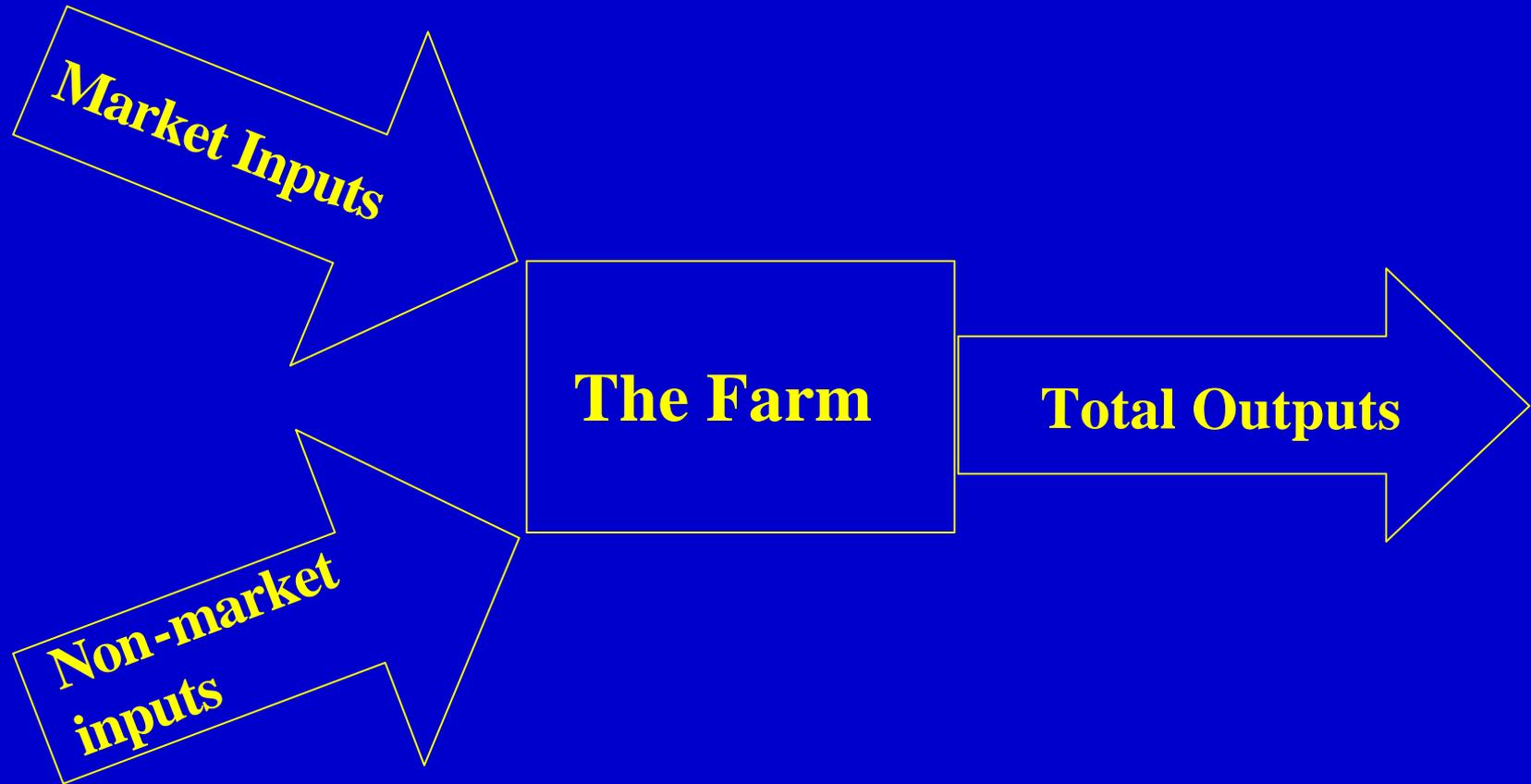
- Assumes BMPs will affect NSP
- Does not use farmer's knowledge as business manager

Incentives for Performance



More Options = Lower Cost

Environmental Management Becomes Part of Farm Business Management



Potential Benefits

- Flexibility
- Induced innovation
- Lower-cost solutions
- Enhanced farm income
 - Not market distorting
 - WTO compatibility

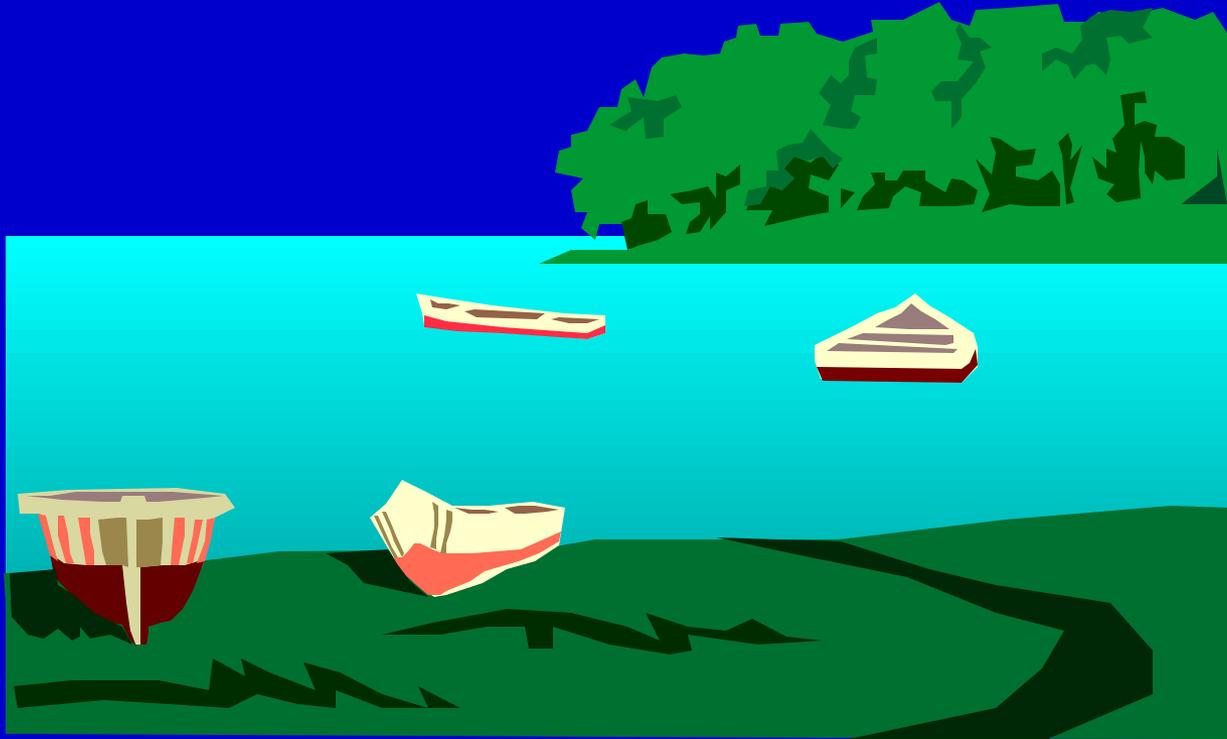
Challenges and Constraints

- Measuring performance
- Information-intensive
 - Farmer information needs
 - Agency information needs
- Appropriately designed incentives
- Shifting gears

Performance Measures

- Where, how, and when environmental performance is measured and monitored
- Need measures that are closely related to ultimate water quality concern AND directly influenced by farm management decisions

Performance Measures – In the Lake, Bay, or Ocean



Performance Measures – In the River



Performance Measures – On the Farm



Examples of Farm-level Performance Measures

Resource Concern: Phosphorus Control

Example: Whole-farm P Index Score

Resource Concern: Nitrogen

Example: Cornstalk Nitrate Test

Resource Concern: Sediment

Example: Soil Conditioning Index

The Performance-based Environmental Policies for Agriculture (PEPA) Initiative

Consists of two related projects:

- National Facilitation Project (NIWQP)

- Providing information and guidance to stakeholder groups around the U.S.

- Pilot-Testing Project (NRCS-CIG)

- Providing incentives in Iowa and Vermont watersheds

www.flexincentives.com

For More Information:

Visit the project website:

www.flexincentives.com

(Please provide feedback - select “*Outreach Session Evaluation*” link)

Contact the Project Director:

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Farm-level Performance Measure

Resource Concern: Phosphorus Control

Example: Whole-farm P Index Score

- P index calculated for every field used by the farm
- Field scores weighted based on area (and on risk category)
- Incentive payments result from minimizing risk of P loss from the entire farm
- Farmers have:
 - great flexibility in ways to reduce farm score
 - Incentive to find the most cost-effective solutions

Weighted Whole-farm P Index Score

Measuring Performance - A Simplified Example

Fields	Acres	Area Weight	IPI Score	IPI Category	Risk Weight	Weighted Score
Field 1	100	0.20	17	Very High	25	85
Field 2	100	0.20	8	High	16	25.6
Field 3	100	0.20	3	Medium	9	5.4
Field 4	100	0.20	2	Low	4	1.6
Field 5	100	0.20	1	Very Low	1	0.2
Total	500	1.00				117.8

Weighted Whole-farm P Index Score

Calculating Incentives - A Simplified Example

Weighted Farm Score	Incentive Payment per Acre
<50	\$5.00
<100	\$4.00
<150	\$3.00
<200	\$2.00

Total Farm Acres	Weighted Farm Score	Payment per Acre	Total Annual Payment
500	117.8	\$3.00	\$1,500

To estimate cost-effective payment levels, the cost of achieving performance targets needs to be understood.

Watershed-level Performance Measure

Resource Concern: Phosphorus Control

Example: P Level at Mouth of Watershed

- Triggers bonus payment for participating farmers
- Provides a reality check on WQ improvement from farm-level performance
- May induce some peer pressure for participation

Farm-level Performance Measure

Resource Concern: Nitrogen Loss

Example: Cornstalk Nitrate Test

- Residual nitrate at harvest shows if excess N was present during growing season
- Optimum range is from 700-2,000 ppm N
- Incentive paid for average farm score below 2,000 ppm (increases below 1,500 and 1,000)

Farm-level Performance Measure

Resource Concern: Erosion/Sedimentation

Example: Soil Conditioning Index

- Predicts soil organic matter and quality via:
 - OM returned to the soil
 - Field operations that affect OM
 - Erosion (RUSLE II)
- Farmers receive per acre payment for a weighted average SCI score of 0.1 or greater
 - Payments can increase for each increase of 0.1 in SCI score
- Improves long-term soil productivity, while minimizing soil erosion