Institute of Governmental Studies
(University of California, Berkeley)

Year 2005 *Paper WP*2005;32

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UC-BERKELEY

Center on Institutions and Governance Presentation No. 16

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February 2005

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Slide 1

U.S. Agri-Environmental Programs and their Potential Implications for Agricultural Trade

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The Political Economy of Agriculture and the Environment in the US and EU
Grass Valley, CA May 27-28, 2005

*The views presented herein are those of the author and not necessarily of the Economic Research Service nor the U.S. Department of Agriculture.

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Introduction

- Many OECD countries have a strong interest in developing and extending agri-environmental payment programs.
- These programs pay farmers to adopt environmentally sound practices or to retire environmentally sensitive land from production.
- Agri-environmental payment programs can improve the environmental performance of agriculture.
- In addition, they may provide an alternative source of farm income.

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Introduction - Continued

- The WTO does not limit expenditures on agri-environmental programs meeting the design criteria for the WTO's green box.

- However, the inclusion of an agri-environmental payment program into the "green box" could be challenged by WTO member countries.

  - This challenge could be made on the basis that it has more than "minimal" trade-distorting impacts on production.

  - This challenge could be of increased concern given the expiration of the "peace clause" (Article 13 of the Agreement on Agriculture) at the end of 2003.

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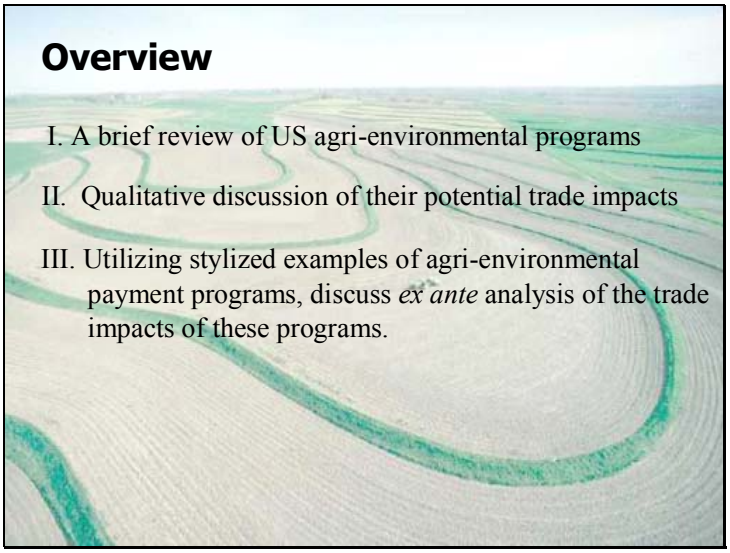
Overview
I. A brief review of US agri-environmental programs
II. Qualitative discussion of their potential trade impacts
III. Utilizing stylized examples of agri-environmental payment programs, discuss *ex ante* analysis of the trade impacts of these programs.

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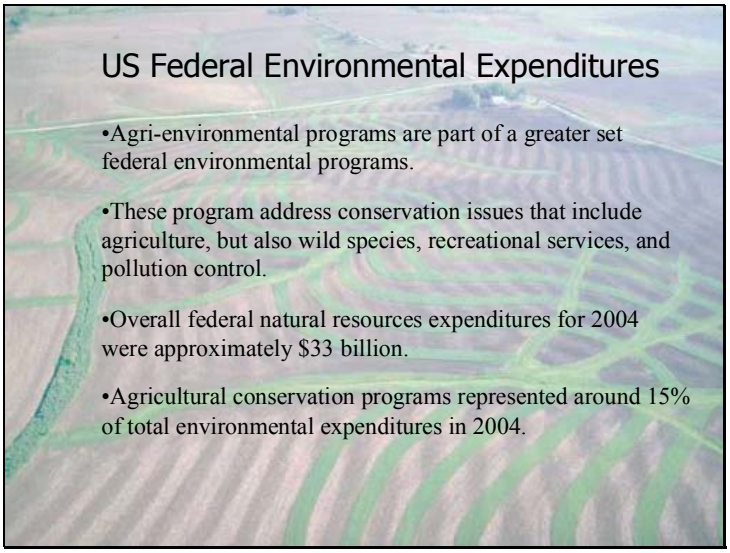
US Federal Environmental Expenditures
•Agri-environmental programs are part of a greater set federal environmental programs.
•These program address conservation issues that include agriculture, but also wild species, recreational services, and pollution control.
•Overall federal natural resources expenditures for 2004 were approximately $33 billion.
•Agricultural conservation programs represented around 15% of total environmental expenditures in 2004.

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U.S agri-environmental policy has wide-ranging objectives

- Improving water quality
- Maintaining soil quality
- Improving air quality
- Increasing wildlife habitat
- Increasing carbon sequestration
- Maintaining open space and other rural amenities

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U.S. policy relies on voluntary subsidies and compliance mechanisms

- Land Retirement
  - Conservation Reserve Program (CRP)
  - Wetland Reserve Program (WRP)
- Working Land
  - Environmental Quality Incentives Program (EQIP)
  - Conservation Security Program (CSP)
- Land Preservation
  - Farm and Ranchland Protection Program (FRPP)
  - Grassland Reserve Program (GRP)
- Compliance Mechanisms

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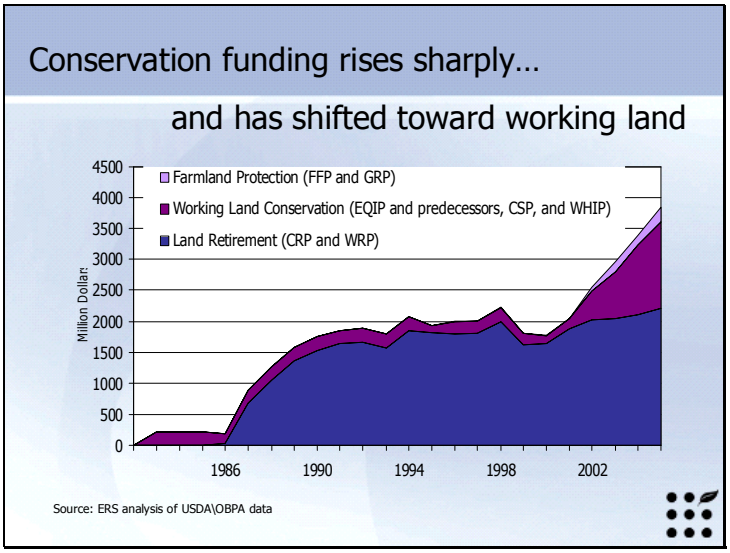
Conservation funding rises sharply…
and has shifted toward working land
Farmland Protection (FFP and GRP)
Working Land Conservation (EQIP and predecessors, CSP, and WHIP)
Land Retirement (CRP and WRP)
Million Dollars
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1986
1990
1994
1998
2002
Source: ERS analysis of USDA\OBPA data

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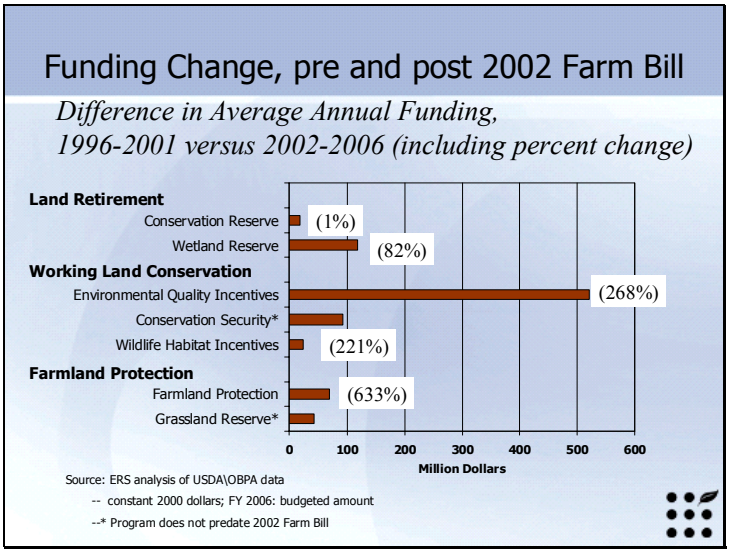
Funding Change, pre and post 2002 Farm Bill
Difference in Average Annual Funding,
1996-2001 versus 2002-2006 (including percent change)
Land Retirement
Conservation Reserve
(1%)
Wetland Reserve
(82%)
Working Land Conservation
Environmental Quality Incentives
(268%)
Conservation Security*
Wildlife Habitat Incentives
(221%)
Farmland Protection
Farmland Protection
(633%)
Grassland Reserve*
0
100
200
300
400
500
600
Million Dollars
Source: ERS analysis of USDA\OBPA data
-- constant 2000 dollars; FY 2006: budgeted amount
--* Program does not predate 2002 Farm Bill

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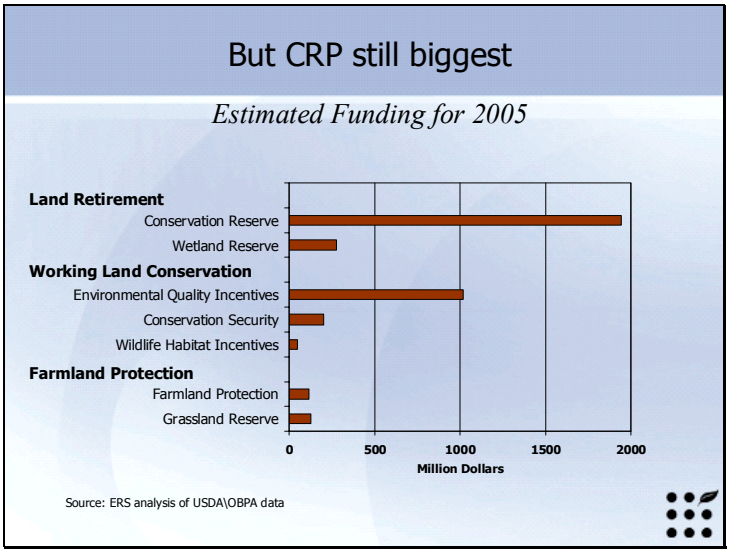
But CRP still biggest
Estimated Funding for 2005
Land Retirement
Conservation Reserve
Wetland Reserve
Working Land Conservation
Environmental Quality Incentives
Conservation Security
Wildlife Habitat Incentives
Farmland Protection
Farmland Protection
Grassland Reserve
0
500
1000
1500
2000
Million Dollars
Source: ERS analysis of USDA\OBPA data

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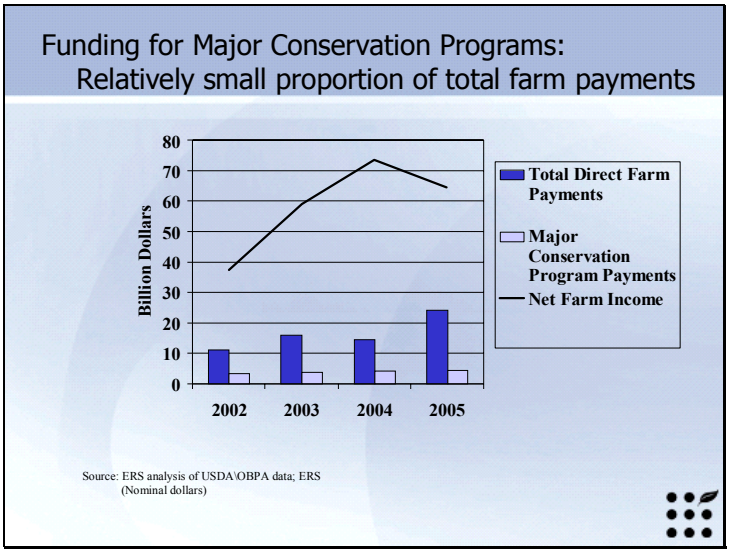
Funding for Major Conservation Programs:
Relatively small proportion of total farm payments
Billion Dollars
80
70
60
50
40
30
20
10
0
2002
2003
2004
2005
Total Direct Farm Payments
Major Conservation Program Payments
Net Farm Income
Source: ERS analysis of USDA\OBPA data; ERS
(Nominal dollars)

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Land Retirement: Mostly CRP

- Conservation Reserve Program (CRP)
  - -35 million acres enrolled,
  - - 10-15 year enrollment
  - - Average rental payment of about $45/acre
  - - Vast majority of acres are in "general signup" (farmers compete for acceptance based on their EBI score).
- Wetland Reserve Program (WRP)
  - -1.6 million acres enrolled
  - -Average cost of about $1,400/acre
  - -Mostly permanent, but also 30 year easements

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EQIP: Emphasis on livestock

- 60 percent of funding is earmarked for livestock producers; up from 50 percent in 1996 Act.
- Livestock operation size limit of 1,000 animal units is eliminated.
- Single operation limited to a total of $450,000 for 2002-07.
- Participating livestock operations to develop comprehensive nutrient management plans.

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EQIP: More money...less targeting?

Some details of EQIP changed with the 2002 Farm Bill:

- Priority areas are eliminated
- Maximization of environmental benefits per dollar of program expenditure is no longer required
- "Bidding down" is eliminated
- Priority can be given to producers who:
  - use cost-effective conservation practices
  - address national conservation priorities
- Money earmarked for water conservation

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Conservation Security Program: Conservation for everyone?

- Wide ranging objectives; focus on land-based practices, livestock waste management facilities excluded
- Entitlement funding (but funding is limited)
- Existing practices can be enrolled
- Three "tiers" for participation; higher tiers require greater conservation effort and offer larger payments
- Must use practices that meet standard at least cost
- No environmental benefit-cost targeting
- Cropland eligible only if farmed 4 of 6 years prior to 2002

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Increased emphasis on farmland protection

- Farm and Ranchland Protection Program (FRPP)
  - 10-fold increase in funding: $597 million is mandated for 2002-07
  - Acreage cap removed
  - Land with historical or archaeological resources is eligible
- Grassland Reserve Program (GRP)
  - Up to 2 million acres of grassland will be protected from conversion to other uses
  - Up to $254 million available for 2002-07
  - Long term (10 years or more) rental agreements and both 30 year and permanent easements are offered.

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Compliance mechanisms

- Basic environmental compliance required to receive farm program payments
  - Sodbuster/Conservation Compliance: Apply conservation systems on highly erodible cropland
  - Swampbuster: Refrain from draining wetland
- Only minor, technical changes in the 2002 farm bill over 1996 farm bill

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Trade Implications of
U.S. Agri-Environmental Programs
Little empirical evidence to date on commodity production implications of U.S. agri-environmental programs,
but a qualitative examination of the domestic production implications can provide insights about the magnitude of the potential trade impacts.

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CRP: biggest production impacts

Of course, direct impact of land retirement is to decrease production, *but:*

- "Slippage", or the reallocation of non-cropland outside CRP to crop use may occur.
  - Wu (2000) argues that 21 acres of land are brought into production for every 100 acres retired into CRP.
  - Roberts and Bucholtz (2004), using the same data, found no evidence of slippage in the CRP.
- Some land enrolled in CRP might have left production even if not enrolled in CRP (8% according to Lubowski *et al*.)

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EQIP: small production impacts

No quantitative assessment available, but

- Only newly installed practices can be funded, suggesting limited impacts on production *if* the farmer has no intention to adopt practice otherwise.
- However, emphasis is on assisting livestock operators to comply with the new Clean Water Act regulation.
  - ✓ Hence, exits of livestock operators could fall relative to a situation without EQIP payments but with CWA.
- EQIP would be more likely to reduce potential declines in production rather than increase production.

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CSP: small production impacts

Eligibility of existing practices for stewardship payments could promote expansion of production, *but*:

- CSP is available in a limited number of watersheds (for now).
- Annual payment limitations per tier.
- Cropland must have been cropped in 4 of last 6 years to be eligible for any cropland payment component of CSP.
- Except perhaps for Tier 3 payments, per acre payments may not be high enough to sway decision between producing and not producing.
- CSP funding limitations

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Farmland Preservation Programs: small production impacts

- *Farm and Ranch Lands Protection Program (FRPP)*
- *Grasslands Reserve Program (GRP)*

In principle, programs that help to keep land in farming could maintain production relative to a state without these programs.

- Through 2003, around 300,000 acres have been protected through FRPP.
- But the US has around 450 million acres of cropland, of which 340 million acres are harvested.
- Even including State preservation programs, production impacts are small.

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Empirical Analysis of Potential Trade Impacts

Claassen, Cooper, and Peters (2005) utilize stylized examples of agri-environmental payment programs to conduct:

- *Ex ante* analysis of the trade impacts of these programs
- Sensitivity analysis of production to changes in agri-environmental payments

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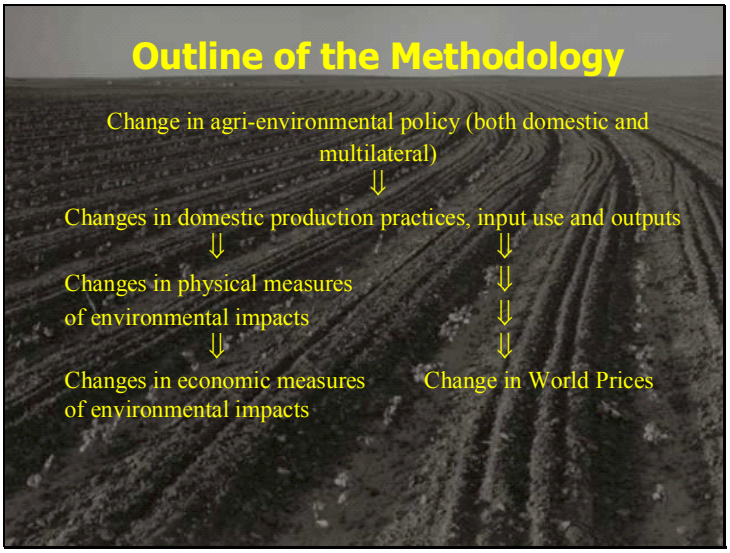
Outline of the Methodology
Change in agri-environmental policy (both domestic and multilateral)
⇓
Changes in domestic production practices, input use and outputs
⇓
Changes in physical measures of environmental impacts
⇓
Changes in economic measures of environmental impacts
⇓
Change in World Prices

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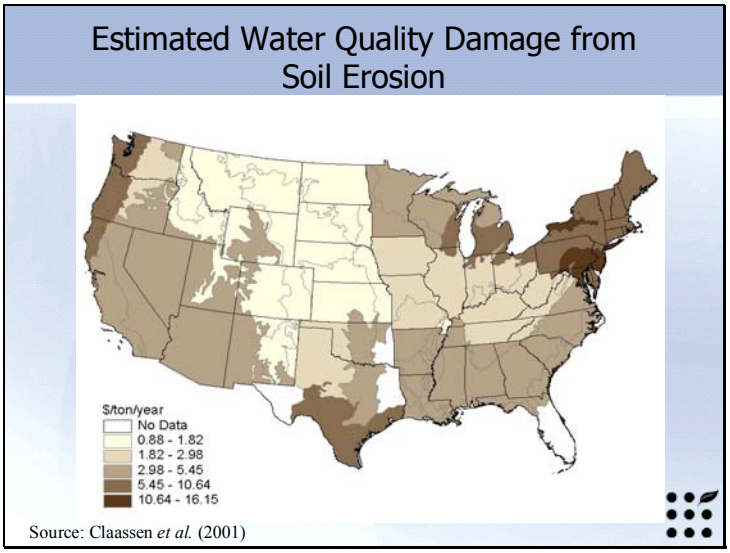
Estimated Water Quality Damage from Soil Erosion
$/ton/year
No Data
0.88 - 1.82
1.82 - 2.98
2.98 - 5.45
5.45 - 10.64
10.64 - 16.15
Source: Claassen *et al.* (2001)

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Program Scenarios - Good Performance

•**The *good performance* base requires the farmer to use a "low rainfall erosion" production system.**

•**Payment per acre is soil conserved (tons per acre) times a payment rate ($1 to $4) per ton of soil conserved.**

•**Soil conserved is the *difference* between:**
(a) maximum erosion rate observed for any production system for a given soil in a given region; *and*
(b) the estimated rate of erosion for the "low rainfall erosion" system in use on the same soil in the same region.

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Program Scenarios - Good Performance

The *good performance* base is further broken down into two policy scenarios – *sodbuster* and *no sodbuster*

- **with the *sodbuster* scenario: farmers in the program who bring previously uncropped HEL into production lose other farm program benefits.**
- **with the *no sodbuster* scenario, farmers in the program who bring previously uncropped HEL into production do not lose other farm program benefits.**

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Program Scenarios - Improved Performance

- **The *improved performance* base requires the farmer to reduce erosion from pre-program levels.**

- **Payments are based on "ACTUAL" erosion reduction from pre-program levels (rather than erosion relative to a reference level.)**

- **Payments per acre are equal to erosion reduction (tons per acre) multiplied by payment rate per ton of erosion reduction.**

- **Payment rates used in the analysis range from $4 to $14 per ton of erosion reduction**

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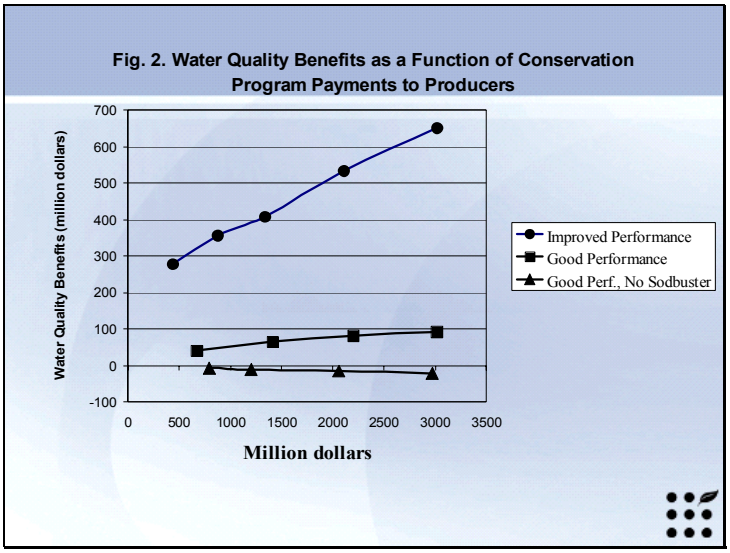
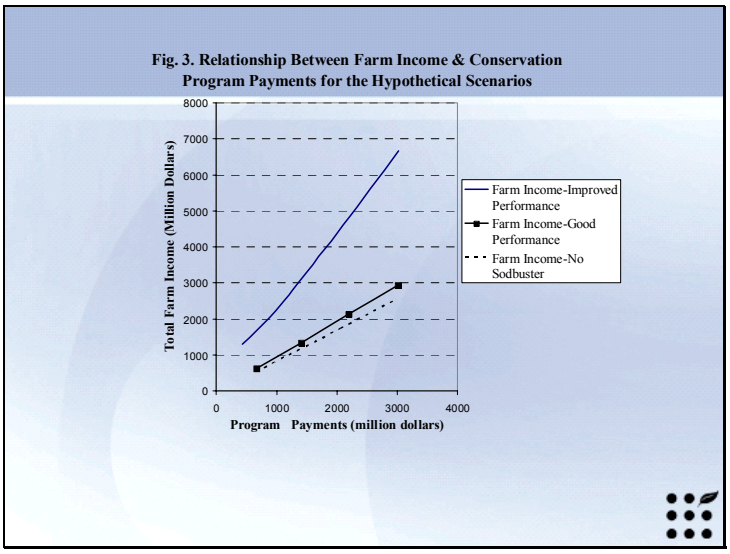


Slide 30



Slide 31

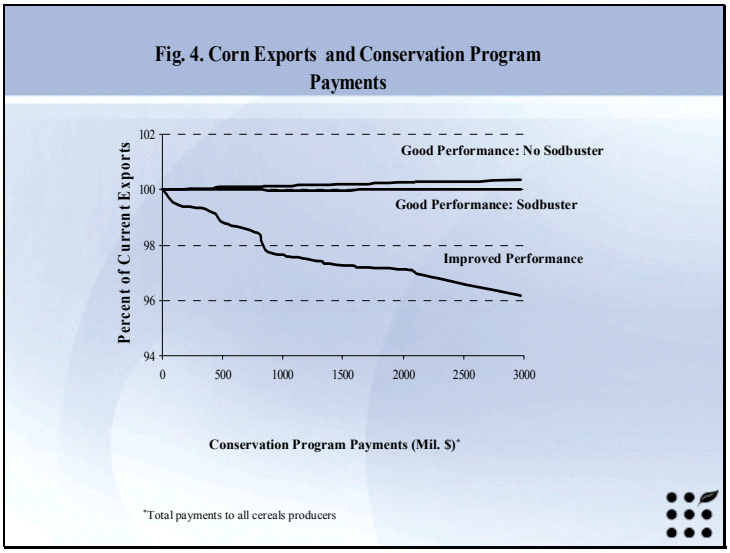


Fig. 4. Corn Exports and Conservation Program Payments
Percent of Current Exports
102
100
98
96
94
0
500
1000
1500
2000
2500
3000
Good Performance: No Sodbuster
Good Performance: Sodbuster
Improved Performance
Conservation Program Payments (Mil. $)+
+Total payments to all cereals producers

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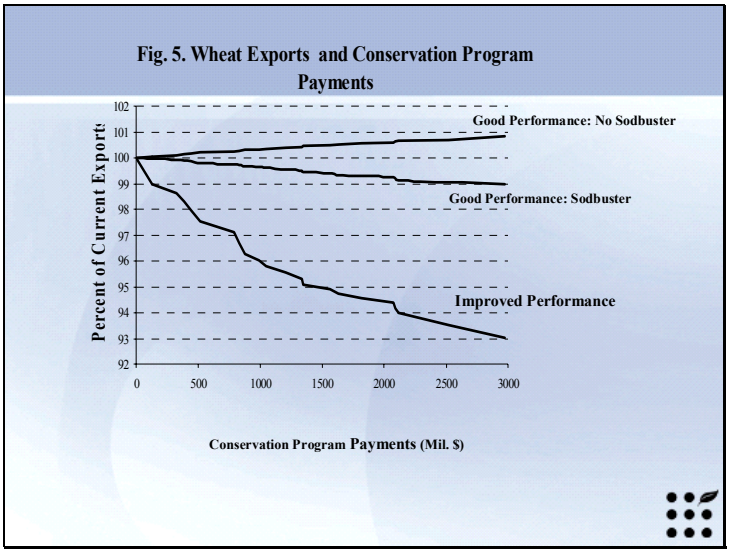
Fig. 5. Wheat Exports and Conservation Program Payments
Percent of Current Exports
102
101
100
99
98
97
96
95
94
93
92
0
500
1000
1500
2000
2500
3000
Good Performance: No Sodbuster
Good Performance: Sodbuster
Improved Performance
Conservation Program Payments (Mil. $)

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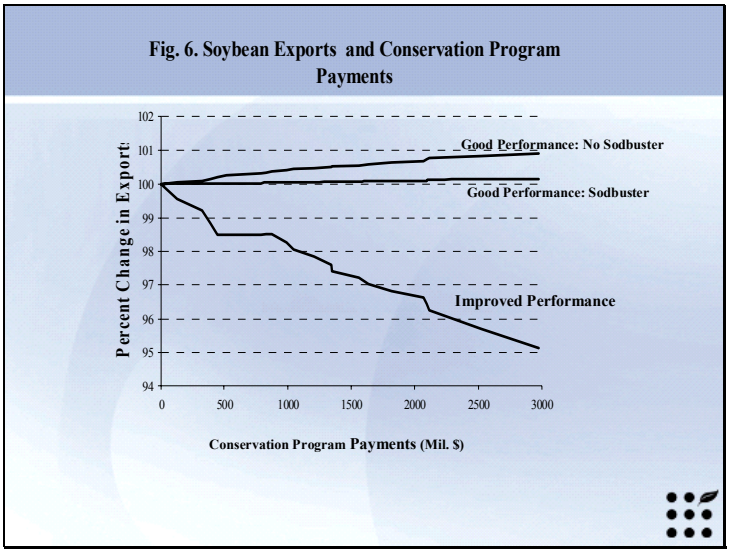
Fig. 6. Soybean Exports and Conservation Program Payments
Percent Change in Exports
102
101
100
99
98
97
96
95
94
0
500
1000
1500
2000
2500
3000
Good Performance: No Sodbuster
Good Performance: Sodbuster
Improved Performance
Conservation Program Payments (Mil. $)

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Discussion and Conclusions

- **Expiration of the "peace clause" at the end of 2003 provides one motivation for this study.**

- **In any case, the concept of the "green box" is an economic concept, and policy instruments that fall into this category are supposed to be minimally trade-distorting (Josling, 2000).**

- **Stewardship payments that have the potential to increase farm income could increase production.**

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Discussion and Conclusions

- Current USDA conservation programs do not appear to have much potential to increase production.
- However, some of them could have the potential to slow decreases in production, ceteris paribus.
- Production decreasing impacts of land retirement programs are most likely greater than potential increases associated with working lands programs.
- The net impact of U.S. agri-environmental programs on production is likely negative.

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Discussion and Conclusions

- **For the three agri-environmental payment scenarios evaluated, the maximum change in exports ranges from a**
  - **7 percent *decrease* (wheat) to a**
  - **1 percent *increase* (soybeans).**

- **Programs that decrease U.S. production are unlikely to be challenged before the WTO.**

- **While "minimal" is not defined and is open to interpretation, 1 percent is probably small.**

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