Regulatory Approaches to Address Agricultural Water Quality

Catherine L. Kling
Department of Economics
Center for Agricultural and Rural Development
Iowa State University

Iowa Water Conference
March 5, 2013
Topics

1. Economics, externalities and market failure
2. Types of Environmental Regulations
3. Examples from outside of Agriculture
4. Examples in Agriculture
Nutrients leaving fields and entering waterways are classic example of an “externality,” --- a form of market failure.

Externality = unintended side effect of production that imposes costs on others.

Market outcomes are not efficient when externalities are not accounted for.
Economics: Policy Goals

1. Achieve environmental improvement goals

2. Do so at lowest cost possible

Generally agnostic about final incidence (who ultimately pays the cost)

Consumers, Producers, Taxpayers?
Economics: Corrective Measure for Externalities

- Taxes (or subsidies)
- Voluntary Approaches (may be with financial incentives)
- Regulations
  - Technology requirements
  - Standards (permits)
  - Permit trading, “cap-and-trade,” “offsets”
  - Other (compliance requirements, labeling requirements)
Some Regulation types

- Technology Requirements: required to adopt specific method of production or technology
e.g., catalytic converters, scrubbers, ban DDT, etc.
- Standards: required to have permits to cover their emissions and/or to meet limits
e.g., vehicle emission standards, TSP standards, zoning requirements, etc.
- Cap and trade: aka marketable permits
- Cross Compliance: conservation compliance
- Labeling requirements
Example Regulation: Point Sources and the Clean Water Act

- 1972: Federal Water Pollution Control Act Amendments, Permits required to discharge
- Permits are based on
  - technology requirement and
  - water quality based limits
- Permit requirements apply to
  - 5 conventional pollutants,
  - 126 toxic and priority pollutants, and
  - non-conventional pollutants (includes N and P)
Example Regulation: Point Sources and the Clean Water Act

- 48,000 NPDES permits issued to industrial facilities, plus general permits

- Enforcement, permits stipulate sampling and monitoring methods, EPA and state agencies can inspect and issue fines for noncompliance

- Major water quality improvement across U.S. attributed to the permits requirements
Example Regulation: Air Quality and the Clean Air Act

- **SO2 market in Clean Air Act**
  - 1990 Clean Air Act Amendments
  - Regulated SO2 discharges from power plants
- **Made them tradable: cap-and-trade**
  - Producer could meet cap themselves or could buy credits from those who exceeded their clean up
  - SO2 emissions from have fallen from 17.3 million tons in 1980 to about 7.6 million tons in 2008, a decrease in emissions of 56 percent (EPA)
Environmental Regulations in Agriculture

- Nonpoint Sources largely exempted from Federal Clean Water Act, but states can regulate
- Winter bans on manure spreading: Vermont and Maine
- Vegetative buffer requirements: Minnesota, agricultural areas near waterways require 50’ buffer strips
- Chesapeake Bay states discussion
BMPs: Everglades Agricultural Area

- 718,000 acres (40 acre fields)

- Everglades Regulatory Program
  - goal 25% P reduction overall
  - mandatory BMPs, 1995
  - Implemented via points
    - flexibility in BMPs, 25 points/farm
    - expert judgment set point values
    - must implement and monitor WQ
EAA Regulatory Program

- EAA = 283,000 ha (~700,000 acres)
- Mainly sugarcane, some sod, vegetables and rice
- First 3 years: 55% P load reduction (SFWMD, 1998)
Results of Program: Phosphorus Loads

Thanks for your attention, questions welcome