

# Economic Forces and Progress with Preplant Methyl Bromide Alternatives

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Alternatives and Emmissions Reductions

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# OVERVIEW

- Define Economics
- What Economics Says about Research
- Economic Feasibility and Critical Uses
- Economic Perspective on Adoption of New Technology
- Economics and Other Policy Issues

# Economics

DEFINITION: Economics studies the problems of the allocation of scarce resources between alternative and competing ends.

MICRO VS MACRO

CONSUMER/FIRM



INDUSTRY



SECTOR



NATIONAL ECONOMY



GLOBAL ECONOMY

# Economics

- Economic Research, Theory, and Models
- Equity and Efficiency
- Institutions and Law
- Policy

# Economics and Research

- Research should be publicly funded when
  - Private sector provides too little
    - Risk high / Rewards low
    - Scale is too big
    - Intellectual property rights limited
  - Large externalities benefiting society
  - Essential to National Security
  - Statutory mandate or Treaty obligation

# Economics and Research

- Strong property rights enforcement encourages private research
- Theories of competition and efficiency suggests public resources be allocated by competition
- Equity side of economics suggests allocation to achieve a distribution goal
- Economics of Public Choice notes roles for political process, citizen preferences, ...

# Feasibility

<b>Technical</b>	<b>Economic</b>
Physical measures	Monetary measures
Published research on efficacy, e.g., yield, percent survival	Proprietary business data; Forecast costs, prices, quality; Representative firm
Experimental plots and field trials; experiments and site evaluations	User assessments; Observed market outcomes--adoption
Tends to focus on single production period or trial	Sustainability is critical
Unclear how variable performance affects technical feasibility	Even small negative deviations could be catastrophic

# Feasibility

- If an alternative is not technically feasible, it cannot be economically feasible.
- Thus, CUN's that claim lack of technically feasible alternative, frequently do not report economic data.
- Both technical and economic feasibility may have large situational aspect.
- Thus, must determine on case by case basis.

# Approaches to Economic Feasibility

- Partial Budgeting
- Net Revenue Analysis
- Transferability/Adoption Models
- False or Pseudo-economic Reasoning

## Alternative results in

	Lower costs	Higher costs
Lower gross revenue	<p><b>Ambiguous.</b></p> <p><b>Alternative is economically feasible if costs decrease more than revenues.</b> If revenues decrease more than costs, the alternative may or may not be economically feasible</p>	<p><b>Alternative may be marginally or significantly inferior.</b> May be cases where alternative is deemed economically feasible</p>
Higher gross revenue	<p><b>Alternative is superior.</b> Maybe a little, maybe a lot.</p>	<p><b>Ambiguous.</b></p> <p><b>Alternative is economically feasible if revenues increase more than costs.</b> If costs increase more than revenues, the alternative may or may not be economically feasible.</p>

# CRITICAL USE NOMINATIONS

- The United States 2004 Critical Use Nominations are posted on the EPA website
- [www.epa.gov/spdpublic/mbr/2004\\_nomination.html](http://www.epa.gov/spdpublic/mbr/2004_nomination.html)
- I am not reporting any MBTOC findings regarding the U.S. nominations.

# EGGPLANT

Alternative	Yield*	Cost in year 1 (U.S.\$/ha)	Cost in year 2 (U.S.\$/ha)	Cost in year 3 (U.S.\$/ha)
Florida				
Methyl Bromide	100%	\$3,010	\$3,010	\$3,010
1,3-D + Chloropicrin	71%	\$3,719	\$3,719	\$3,719
Metam-Sodium	56%	\$3,519	\$3,519	\$3,519
Georgia				
Methyl Bromide	100%	\$3,642	\$3,642	\$3,642
1,3-D + Chloropicrin	71%	\$3,242	\$3,242	\$3,242
Metam-Sodium	56%	\$3,027	\$3,027	\$3,027
Michigan				
Methyl Bromide	100%	\$1,475	\$1,475	\$1,475
1,3-D + Chloropicrin	94%	\$1,772	\$1,772	\$1,772

<b>MICHIGAN EGGPLANT</b>	<b>Methyl Bromide</b>	<b>1,3-D + Chloropicrin</b>
<b>Yield Loss (%)</b>	0%	6%
<b>Yield per Hectare</b>	3,665	3,445
<b>* Price per Unit (us\$)</b>	\$9.30	\$8.60
<b>= Gross Revenue per Hectare (us\$)</b>	\$34,074	\$29,627
<b>- Operating Costs per Hectare (us\$)</b>	\$24,730	\$24,359
<b>= Net Revenue per Hectare (us\$)</b>	\$9,344	\$5,268
<b>Loss Measures</b>		
<b>1. Loss per Hectare (us\$)</b>	\$0	\$4,076
<b>2. Loss per Kilogram of Methyl Bromide (us\$)</b>	\$0	\$84
<b>3. Loss as a Percentage of Gross Revenue (%)</b>	0%	12%
<b>4. Loss as a Percentage of Net Revenue (%)</b>	0%	44%

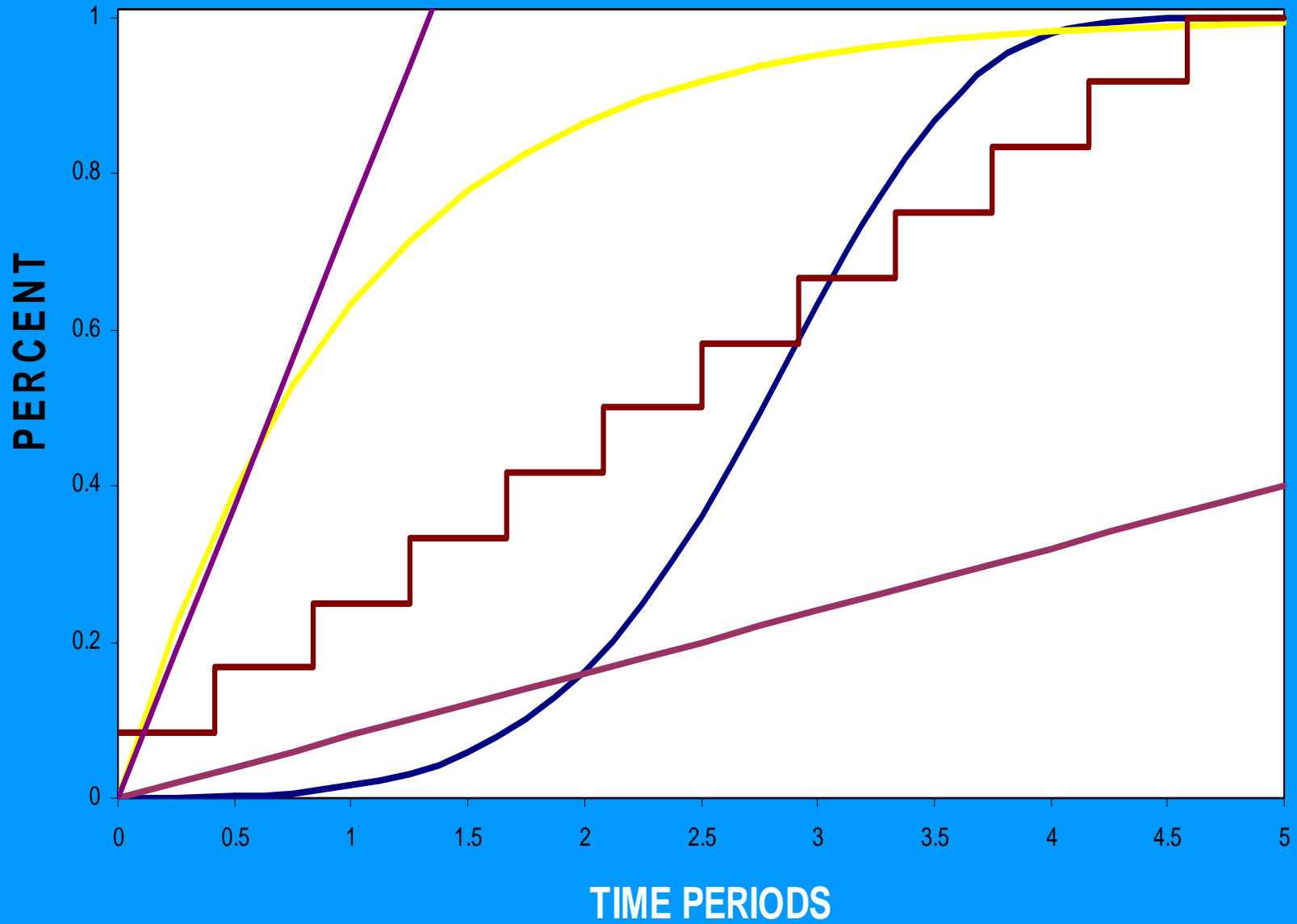
## Florida

No technically (and thus economically) feasible alternatives to MB are presently available to the affected eggplant growers. As such, the U.S. concludes that use of MB is critical in Florida eggplant production.

## Michigan

The U.S. concludes that, at present, no economically feasible alternatives to MB exist for use in Michigan eggplant production. Two factors have proven most important in this conclusion. These are yield loss and missed market windows, which are discussed individually below.

# Adoption of Methyl Bromide Alternatives



# ADOPTION

- Market Forces Only
  - What time path?
- Government Involvement
  - Training, Extension
  - Regulation
  - Taxes and Subsidies
  - Insurance

# Policy Issues with Economic Content

- Is there a bright line to define economic feasibility? What is sufficient evidence?
- Approving CUN's reduces economic incentives for research and commercialization of alternatives. How can Parties maintain economic incentives?
- What rates of commercialization and adoption should Parties look for? No longer a phase out of MB; now a phase in of alternatives.
- How should Parties value risk tradeoff of alternatives for MB? Human and environmental consequences compared to destruction of zone.

# Policy Issues with Economic Content

- How should Parties value risk tradeoff of alternatives for MB? Human and environmental consequences compared to destruction of zone.
- How should Parties ensure equity across users?
  - New entrants
  - New owners
  - Growing or expanding enterprises
  - Old facilities versus new facilities

THANK YOU

THE END