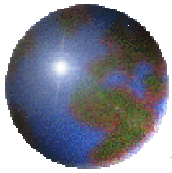


*Analyzing Economic Feasibility for Methyl
Bromide Critical Use Exemptions*

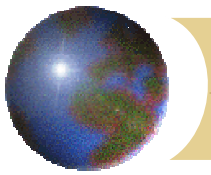
*2003 Annual International Research Conference on
Methyl Bromide Alternatives and Emissions Reduction
San Diego, California Nov. 3-6, 2003*

David Widawsky, Ph.D
Office of Pesticide Programs
U.S. EPA



Outline

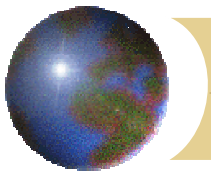
- Protocol requirements for economic considerations for CUEs.
- Concepts of economic feasibility
- Description of economic feasibility measures
- Analytical process in EPA
- Variations on the themes
- Examples: pre-plant, post-harvest
- Designing research to support bio-economic analyses of feasibility



Protocol Language on Economic Feasibility

- (a) That a use of methyl bromide should qualify as 'critical' only if the nominating Party determines that:
 - (i) The specific use is critical because the lack of availability of methyl bromide for that use would result in a **significant market disruption**; and
 - (ii) There are no **technically and economically feasible** alternatives or substitutes available to the user that are acceptable from the standpoint of environment and health and are suitable to the crops and circumstances of the nomination . . .

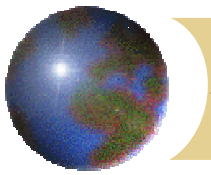
[Decision IX/6, the Parties to the Protocol]



Protocol Language on Economic Feasibility

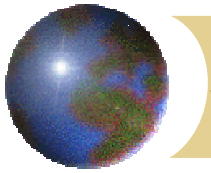
- That production and consumption, if any, of methyl bromide for a critical use should be permitted only if:
 - (i) All technically and economically feasible steps have been taken to minimize the critical use and any associated emission of methyl bromide;
 - (ii) Methyl bromide is not available in sufficient quantity and quality from existing stocks...
 - (iii) It is demonstrated that an appropriate effort is being made to evaluate, commercialize and secure national regulatory approval of alternatives and substitutes...

- Economic analysis becomes very important when alternatives are technically feasible – research studies provide key data for economic analyses.



How do we define “significant market disruption?”

- ⊕ Protocol allows individual Parties to define for themselves.
- ⊕ U.S. Position: markets are defined (in part) by the interaction between supply and demand, which determines the price and quantity of a good traded in a market.
- ⊕ A disruption to either side of a commodity market (supply or demand) would constitute market disruption.
- ⊕ Evaluate whether disruption would occur to the supply side of a market, which is another way of saying disruptions in production.
- ⊕ Disruptions to domestic supply, even if replace by imports, would be a disruption to the market.



Concepts of Economic Feasibility

⊕ Efficiency versus Equity

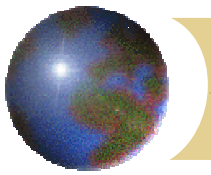
- ⊞ Where is methyl bromide most or least valuable?
- ⊞ For whom is methyl bromide valuable and/or necessary?

⊕ Efficiency

- ⊞ Describes the marginal contribution of methyl bromide.
- ⊞ What are largest or least nominal differences between methyl bromide and alternatives?

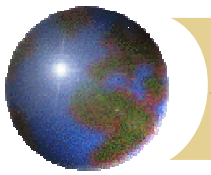
⊕ Equity

- ⊞ Describes how use of methyl bromide or alternative affects viability of firm.
- ⊞ What is the impact of methyl bromide (alternative) on profitability?



Measures of Economic Feasibility

- Basis of economic feasibility is economic loss, which describes the financial impact of using methyl bromide alternatives (relative to MeBr):
 - Yield loss → revenue loss
 - Lower price (from quality or timing) → revenue loss
 - Increased down time → lost revenue (or lower price)
 - Higher equipment costs → higher production costs
 - Longer production cycle → increased production costs, lower revenue
 - Increased fumigation costs → higher production costs
 - Not meeting phytosanitary standards → revenue loss



Measures of Efficiency and Equity: a Portfolio Approach (for Pre-Plant)

Efficiency

Loss per acre

Loss per pound

Loss as % gross
revenues

Equity

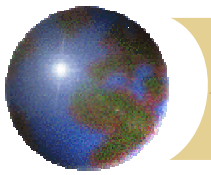
Loss as % net
cash revenue

Loss as % profit

What does the measure tell us?

What data are needed?

What is “significant”?



Measures of Efficiency and Equity: a Portfolio Approach (for Post-Harvest)

Efficiency

Loss per facility

Loss per pound

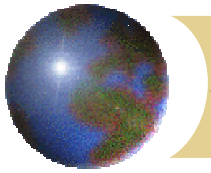
Equity

Loss as % net
cash revenue

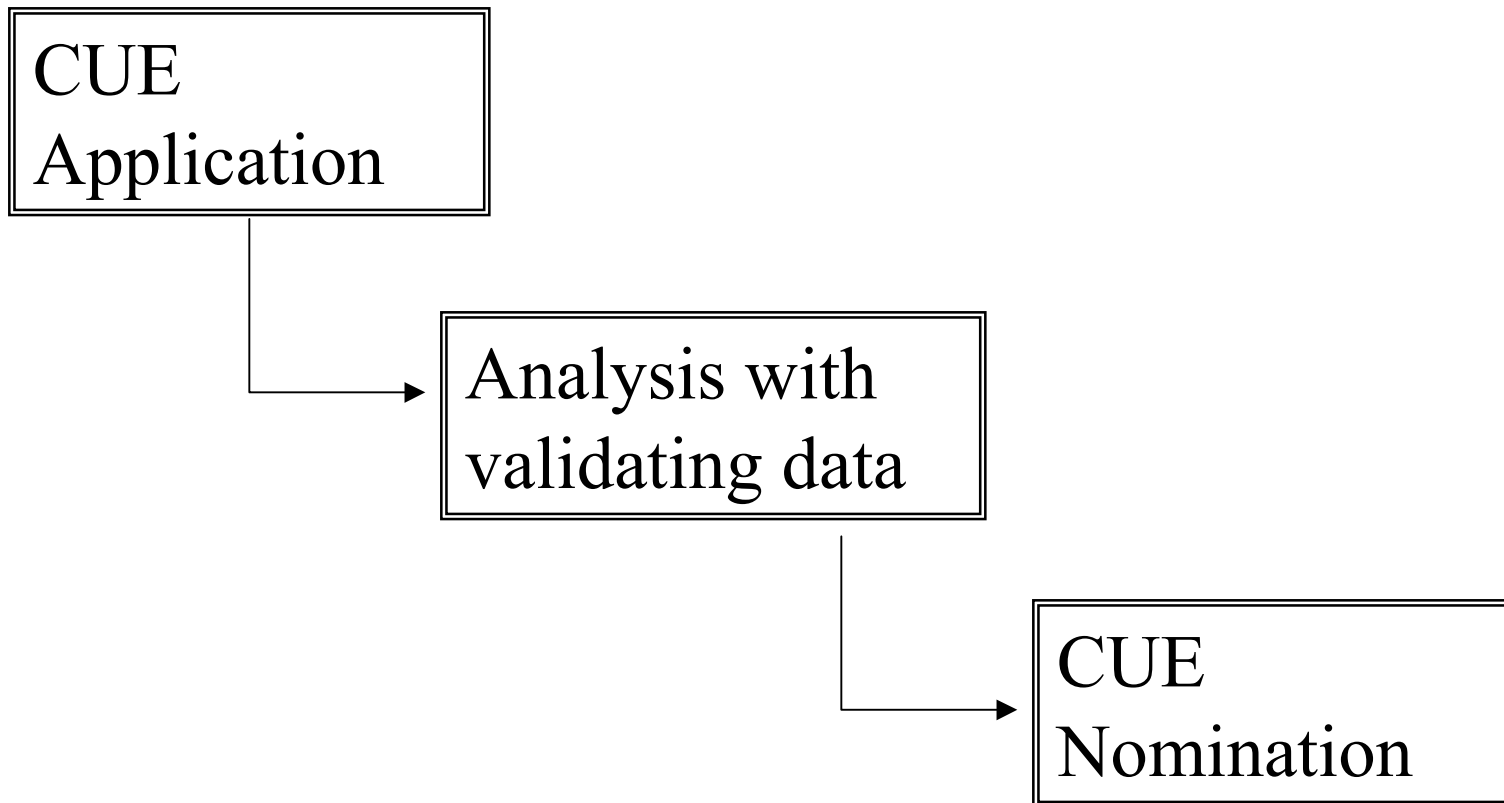
What does the measure tell us?

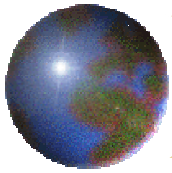
What data are needed?

What is “significant”?



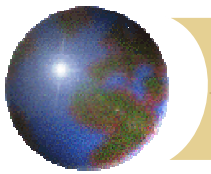
Analytical Process in EPA





Variations on the Themes

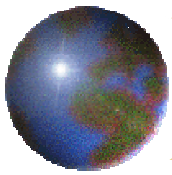
- A number of issues complicate the analyses
 - Multi-year rotations or fumigation cycles (e.g., forest seedlings)
 - Perennial crops: effects occur over lifetime of plant(s)
 - Orchard seedling market may be different from crop market
 - Market timing: crop yields may be steady, but timing affects price received for commodity.



Pre-plant Example: CA Strawberries

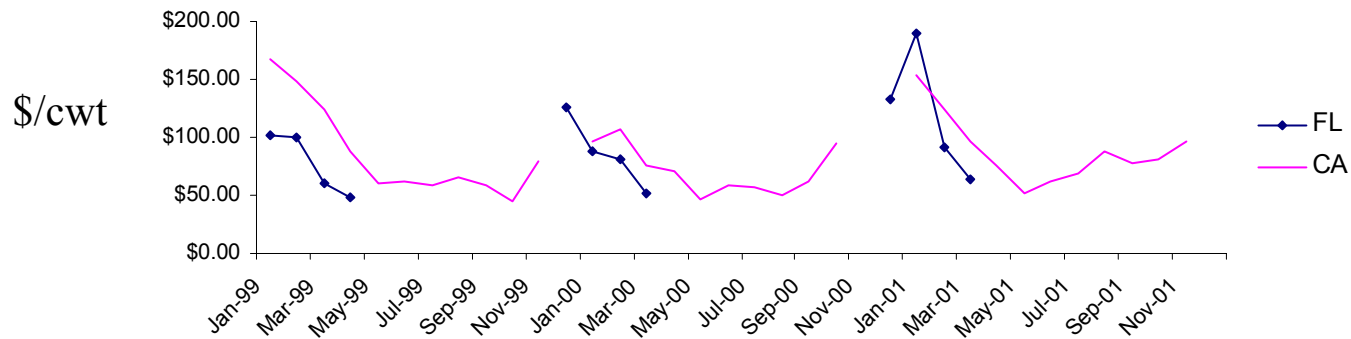
Economic Impact of (1,3-D + Chloropicrin) Use in Place of (Methyl Bromide + Chloropicrin) on Strawberries in the U.S. In Areas of Moderate To Severe Pest Pressure

Loss Measure	California (CUE 02-0024) + Metam-Sodium
% Yield Losses	likely* 14%
Loss* Per Hectare	US\$ 4,901-5,952
Loss* Per Kg MB	US\$ 33-74
Loss* as a % of Gross Revenue	16-20%
Loss* as a % of Net Cash Returns	Not Available



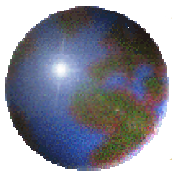
Critical Data Supported Analysis

Price data



Marketing data

- Product performance data: yield, timing, fumigation method issues and costs



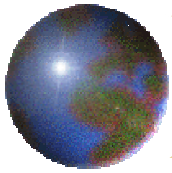
Post-harvest Example: Food Manufacturer

Summary of Financial and Economic Impacts for Food Processing Sector for Heat Treatment.

Economic Loss Measure¹	Rice Milling (representative size: 10 million cf²)	Flour milling (representative size: 1.2 million cf)
Absolute loss per representative facility (Total = a+b+c)	\$683,000	\$386,000
<i>a) Direct pest control costs</i>	\$20,000	\$45,000
<i>b) Capital expenditures</i>	\$250,000	\$175,000
<i>c) Production delays</i>	\$413,000	\$166,000
Economic loss as a percentage of net revenue	41%	25%
Economic loss as per pound of Methyl bromide requested	\$32	\$273

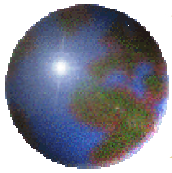
1 Heat treatment is assumed to provide the same level of product protection as methyl bromide and thus, economic impacts are computed as the cost change of switching to the alternatives.

² cubic feet



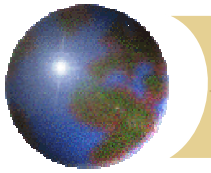
Critical Data Supported Analysis

- ⊕ Manufacturing volume: per day, value
- ⊕ Fumigation pattern: down time, frequency, cost
- ⊕ Fumigation effects: capital expenditure, equipment replacement, sanitary standards
- ⊕ Age of facility
- ⊕ Total costs, revenues



Designing Studies to Evaluate Feasibility

- ❖ Biological data are foundation for loss estimates
 - ❖ Yield is only one piece of the puzzle
 - ❖ Timing: of output/marketing, of production disruptions, of fumigation cycle
 - ❖ Quality: grade (size, color, taste, etc), marketing standards, sorting
 - ❖ Equipment used/replaced
 - ❖ Disposal issues (e.g., tarps, mulch)
 - ❖ Level of pest infestation (for key pests)
 - ❖ Baseline: comparison with methyl bromide



Take Home Points

- Economic feasibility rests on definition of loss.
- Measuring loss requires may require substantial biological data, in addition to the economic data.
- Study design and data collection determine whether study can be used to determine economic feasibility.