

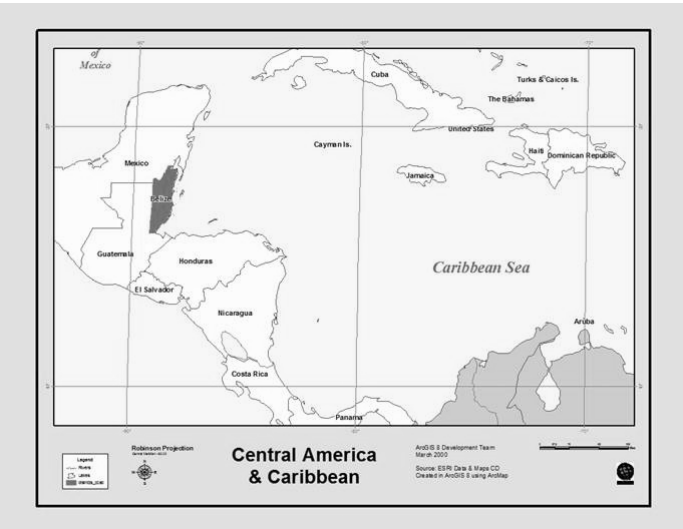
Use of Economic Analysis to inform SPS decision-making

Cost Benefit Analysis of the Pink Hibiscus Mealybug Project in Belize

Geneva October 28, 2009

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Belize Information



Central America & Caribbean

Robinson Projection
Scale: 1:1,000,000

Legend
— Land
— Water
— City
— Airport

Source: ESRI Data & Maps CO
Created in ArcGIS 9 using ArcMap

Andri E. Development Team
March 2002

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Antecedent

- The PHMB *Maconellicoccus hirsutus* (Greene) is a polyphagous pest that affects > 250 species of plants
- PHMB first detected in Grenada in 1984
- Damage sustained by the crops can range from 10% to 90 % (IICA)
- Caribbean - Losses ranged from of \$3.5 and \$125 million annually
- The PHMB has the potential to affect > 200 commodities in 17 countries of the region with a value of US \$84.2 billion (IICA)

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Antecedent cont.

- Control measures attempted in the Caribbean were chemical and cultural but were not very effective
- Biological control using parasitic wasp and predatory beetles was successful – 94% control within 2 years
- PHMB would affect agricultural production and trade in Belize - Primary agriculture production in 2007 = \$143 million
- Biological control programme initiated in 1999 in Belize

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Cost Benefit Analysis

Purpose

- Justification for continued financing and support
- Scope
 - PHMB programme cost and resulting benefits

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Management summary

- Assumptions
 - The impact to the agriculture sector in Belize would be similar to the other Caribbean countries
 - The PHMB programme has prevented the pest from affecting commercial production areas in Belize
 - It has prevented the spread of this pest to other Central American countries
- Constraints
 - Estimating intangibles such as environmental and social impact/benefits difficult

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Methodology

- Immediate action by the GOB = \$125,000.
- International agencies assistance
 - IICA - \$50,000
 - USDA - \$125,000
 - CARDI- \$25,000.
- Costs included in the c/b analysis
 - field activities- surveillance, surveys, control (biological and manual)
 - Insectary- personnel, materials, equipments etc.
- Use economic extrapolation from real case scenarios of other regional countries and use data from in-country sources (CSO, MAF)

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Quantifiable benefits

- The operational and capital costs of the PHMB programme subtracted from the quantifiable benefits in a dollar value net benefit
- The quantifiable benefits were calculated by comparing the alternative system of “do nothing”
- Estimated losses to agriculture over the life of the project would be the benefit of having a system in place

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Intangible benefits

- Aesthetic value
 - Landscape, eco resorts, social
- No environmental impact
- Benefits to C.A.- protection of US \$millions in market access.

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Alternatives

Current system

- Monthly surveillance
- Evaluation of study sites
- Parasitoid release if there is resurgence
- Insectary

Alternative system “do nothing”

- Heavy reliance on pesticide
- High impact on the environment
- Economic thresholds overcome
- Plant Health unable to provide adequate service
- Social impact- backyard fruits
- Loss of aesthetic value

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Operational costs

Activities	2000	2001	2002	Total
Initiation/planning (analysis) IICA/GOB	\$175,000	\$175,000		
Design/construction (USDA)	\$125,000	\$125,000	\$54,250	
Implementation (CARDI)	\$25,000	\$25,000		
Operational costs (OIRSA)	\$82,867	\$72,867	\$38617	\$248,603
Total costs	\$407,867	\$72,867	\$92,867	\$573,603

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Benefits

- PHMB population decreased by 93.1% after the release of the parasitic wasp
- Protection of commercial production areas
- Barrier for Central America
- Extrapolating from the Grenada experience we can determine how much it would cost Belize if we adopted the “do nothing” alternative.

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Cost reduction

- Insectary- local production of *A. kamali* decreased the cost of the programme significantly

Source	A. kamali	Cost US \$	
CABI	150,000	1.80	\$270,000
Belize (2002)	150,000	.40	\$60,000
Annual savings			\$210,000

- *A new insectary was established in 2003 in Belmopan City*
- *Present COP is ~ \$0.18*

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Recurring benefits

- To determine the recurring benefits an example is shown below:

Crop	% loss	Value	Net loss
Banana	10	\$31,400,000	\$3.1 million
Beans	40	\$2,521,451	\$1.25 million
citrus	15	\$57,500,000	\$8.5 million
Papaya	40	\$5,141,150.	\$2.1 million
Hot pepper	25	\$331,201.	\$82,500.

- \$17 million/year in losses x 3 years = \$51 million
- Having a programme in place saved \$51 million in agricultural production

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Comparative cost/benefit summary- 2000-2002

- Cost of programme = **\$568,627.94**
- Averted losses by having a PHMB programme=
\$48,795,801.73
- Cost saving by local production of *A. kamali*=
\$624,535.32
- Total present value (net benefit)= **\$49,420,337.05**
- Net present Value= *Net benefits – Cost of programme*
\$49,420,337.05 – \$568,627.94 = \$48,851,709.11

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Benefit/Cost ratio

- Total present value/cost of the programme
 - $\$49,420,337.05 / \$568,627.94 = 86.9$
- For a project to be viable, it must have a benefit/cost ratio > 1
- Payback period
 - Zero discount rate
 - $\$17,000,000/12$ mnts (assuming equal distribution of losses)= \$1.42 million
 - Within one month, averted losses could pay for the project.

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Conclusion

- Demonstrating the benefits in a “dollar value” to policy makers makes investment in SPS related issues easier
- Present the problem in a way that politicians can understand
- Avoid short term benefits over long term gains
- Systematic surveillance allows for the timely detection of problems
- Have an emergency plan
- Dealing with exotic pests is never easy
- The public can be your best ally or worst nightmare. Keep them informed and updated!
- Maintain strong alliances with regional/international partners

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