Global Economic Impact of Missing and Low Pesticide Maximum Residue Levels Volume 2

2021 MRL Harmonization Workshop

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MRLs Volume 1 – July 2020

- Chapter 1: Introduction
- Chapter 2: MRL Policy Approaches
- Chapter 3: MRL Practices in Major U.S. Export Markets
- Chapter 4: Challenges Associated with MRLs
- Chapter 5: Costs and Effects of Missing and Low MRLs
- Chapter 6: Effects of MRL Policies from the Economic Literature

MRLs Volume 2

- Chapter 1: Introduction
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- Chapter 3: Economic effects of MRLs (gravity models)
- Chapter 4: Effects of MRL policies on production, income, and individual farms

Costs and Effects of Missing or Low MRLs U.S. Producer Case Studies

U.S. Producer Case Studies

- Through case studies, describe the **costs and effects of MRL compliance and noncompliance for U.S. producers**, such as uncertainty in planting decisions, segregation of products, crop protection costs, yield implications, storage issues, product losses, and consequences of MRL violations.
- Include information on costs of adopting new plant protection products or those related to establishing, modifying, or testing for new or existing MRLs in export markets.
- To the extent possible, include effects on **U.S. producers of specialty crops**.

U.S. Case Study List

Primary Producing Regions	Crops
Pacific Northwest	Apples, Pears, Hops, Sweet Cherries
California	Nuts, Celery, Sweet Cherries
Upper Midwest	Tart Cherries, Cranberries
Southeast	Sweet potatoes
Mountain West	Peas and lentils
Mid-atlantic/New England	Cranberries

Main theme: Case studies reflect geographical diversity of U.S. specialty crop production.

Key Takeaways

- Emerging pest pressures create new challenges for growers where solutions may be limited by existing MRLs.
- The costs and effects of MRL changes depend heavily on the pest pressures naturally present in a growing region.
- The most important factor determining how a growing sector will be affected by changing MRLs is the extent to which pesticide alternatives are available. The risk of an MRL violation can be significant in some instances.

Key Takeaways … continued

- MRL violations represent a key problem for some crop sectors, with reductions in revenue and increased logistics costs. Violations and testing can be particularly challenging for exports of perishable crops.
- The reduction or elimination of important MRLs in key export markets can contribute to U.S. growers shifting exports to other markets.
- For crops with longer shelf life, changing MRLs can disrupt grower programs, with growers sometimes altering their pest management strategies even before the MRL reduction or elimination goes into effect.
- Growers in a variety of crop sectors noted disruption to their integrated pest management (IPM) programs when MRLs in key export markets are lowered or eliminated.

Economic Effects of MRLs

Global Effects of MRLs

Two types of effects estimated:

1. **Heterogeneity**: Do differences in MRLs between specific importers and exporters impact trade?
2. **Stringency**: Do MRLs in a country affect its imports from foreign sources generally?

Chapter looks at MRLs from two perspectives

- Direct impacts on bilateral trade between two affected countries
  - 101 individual crops
- Global impacts on both directly and indirectly affected countries
  - 3 crop groups: tropical fruit, temperate fruit, and beans and peas

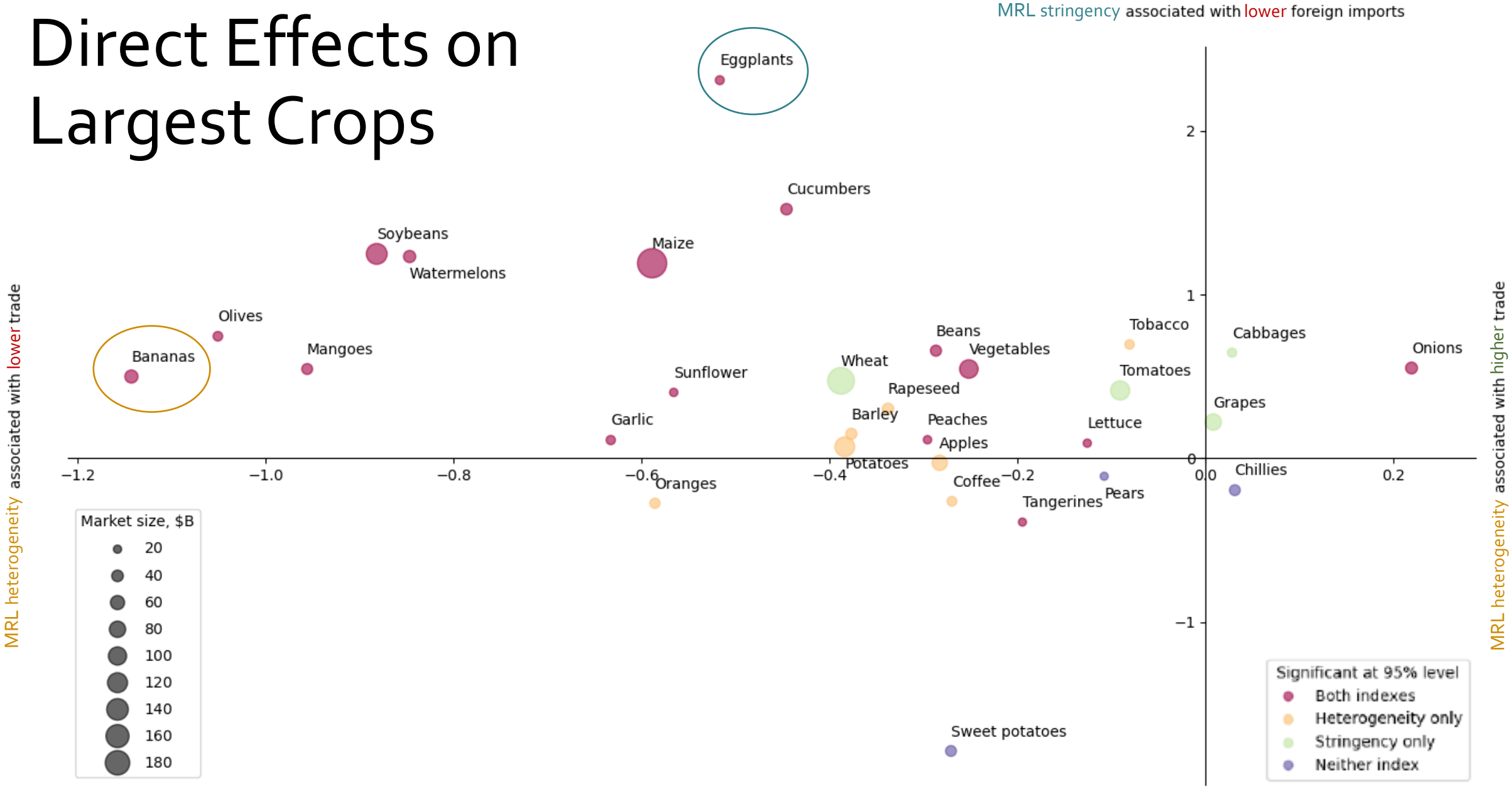
Historical Trade Effects of MRLs

- MRL Heterogeneity
  - Greater heterogeneity has **reduced bilateral trade for most crops**
  - Largest trade-decreasing effects were for bananas, olives, and mangos

- MRL Stringency
  - Importer stringency has **reduced imports for most crops**
  - Largest import-decreasing effects for eggplants, cucumbers, and soybeans
  - Import-increasing effects for tangerines and other citrus

- No strong impact of MRLs in one or both categories for many crops
  - For example, sweet potatoes, pears, and chilies

Direct Effects on Largest Crops



Estimating Global Impacts

- What impacts do the bilateral trade effects of MRLs have on prices, total trade, and wealth?

- We estimate the total effects of a hypothetical 90% reduction in EU MRLs
  - The EU is a major export destination for agriculture and has been highlighted throughout volumes 1 and 2 as being a source of numerous MRL-related challenges
  - 3 crop groups: Tropical fruit, temperate fruit, and beans and peas.

Global Effects of MRL Reductions

Direct trade effects

MRL Estimates	Heterogeneity	Stringency
Tropical fruit	Trade decreasing	Import Increasing
Temperate fruit	Trade decreasing	Import decreasing
Beans and peas	Trade decreasing	Import decreasing

Global effects (direct + indirect)

- EU countries experience the largest effects of changes to EU MRLs
- Countries with close trading relationships or that follow EU MRLs have some significant impacts
- Most other countries face limited impacts
  - Countries shift trade to/from other sources or destinations
- MRLs have compounding and offsetting effects

Result Highlights: Temperate Fruit

- Lower purchasing power throughout EU
  - Consumer prices rose more than producer prices
- Most EU countries redirected trade inwards (domestically or within EU)
  - 0.46% increase in within-EU trade
- Most other countries faced small negative effects due to increased trade costs with EU and its shifting inward
  - Switzerland experienced particularly large effects due to its ties with the EU
  - Effects on U.S. were small but mostly negative

Effects of MRL Policies on Production, Income, and Individual Farms

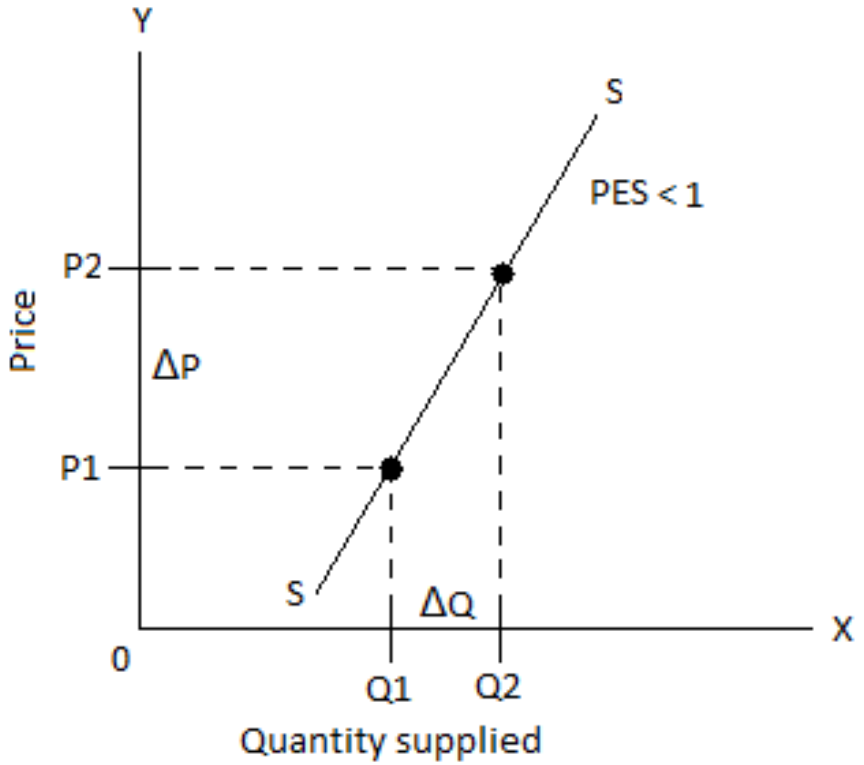
Farm Level Effects of MRLs

- Diverse effects of MRLs in specific sectors
  - Supply responses to price changes
  - Income effects
  - Yield and cost effects of switching production practices
  - Compliance costs
  - Increases in sales due to MRL compliance
- Expands on two case studies described in Volumes 1 and 2
  - **Bananas** from Costa Rica (small country, medium income)
  - **Tart cherries** from United States (large country, high income)

Supply Response Analysis - Approach

- How does agricultural production react to price changes caused by MRLs?
  1. **Estimated**: Price changes derived from the previous model
  2. **Severe**: Larger alternative price changes illustrating a greater, negative effect of MRLs

- Agricultural industries frequently have inelastic supply, particularly tree crops
  - 0.95 for bananas
  - 0.48 for tart cherries



Estimated Supply Responses

- Price changes dictated by market access and demand
  - Lower demand ⇨ lower prices
- Because of low supply elasticities result in muted responses
- Many other supply factors are not incorporated into this analysis, such as yield impacts

	Bananas (Costa Rica)		Tart Cherries (United States)	
Scenario	Estimated	Severe	Estimated	Severe
Price Change (%)	0.2	-5.0	-0.17	-5.0
Production change (%)	0.19	-4.75	-0.08	-2.4
Production change (mt)	4,805	-120,117	-110	-3,247

Farm Income Statement Analysis - Approach

- What are the potential effects of MRL changes on specific hypothetical farms' production and income?
- Approach:
  - Create hypothetical farm income statement
  - Develop assumptions about how that farm would react to various changes in MRLs in the EU market
  - Run various scenarios related to MRL reduction/removal
- Examined Michigan tart cherry and Costa Rica Banana farms

Income Analysis of Michigan Tart Cherry Farm

Farm Characteristics:

- Small orchard
- Exports are often higher-value markets, focusing on the EU
- Uses fenpropathrin to manage SWD (invasive fruit fly)
- Can choose whether to adhere to changes in EU MRLs

What are the effects of removing the MRL for fenpropathrin in EU?

Scenario 1

- Alternative Pesticides
- Exports to EU unchanged
- Alt. pesticides increase variable costs

Scenario 2

- Alternative pesticides
- No exports to EU due to accidental violations
- Increase in variable costs

Scenario 3

- Maintain pesticides
- No exports to EU
- Lower variable costs due to removing testing requirement

Scenario 4

- Alternate pesticides
- Exports to EU increase due to competitive advantage
- Increase in variable costs

Impacts on Michigan Tart Cherry Farm

Percent changes in economic indicators for each scenario

Scenario	1	2	3	4
Exports to EU	0	-100	-100	400
Exports to Rest of World	0	+	0	0
Domestic shipments	0.0	0.0	11.1	-44.4
Producer price	0.0	-29.2	-8.3	29.2
Revenue	0.0	-29.5	-7.2	28.7
Operating income	-1629	-9398	-1642	5188
Operating income margin	-1700	-13975	-1850	4225

Questions ?

Thank you for listening.

Report link

https://www.usitc.gov/publications/332/pub5160.pdf