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Global Economic Impacts of Missing and Low Pesticide Maximum Residue Levels

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Selected Paper prepared for presentation at the International Agricultural Trade Research Consortium's (IATRC's) 2019 Annual Meeting: Recent Advances in Applied General Equilibrium Modeling: Relevance and Application to Agricultural Trade Analysis, December 8-10, 2019, Washington, DC.

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Global Economic Impact of Missing and Low Pesticide Maximum Residue Levels

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U.S. International Trade Commission



Disclaimer:

The views expressed here are those of the presenters, and do not necessarily represent those of any individual Commissioner or of the Commission as a whole.

Outline



Who is the USITC?

Overview of request from USTR

Key concepts and issues

Examination of the economic literature on MRLs

Methodological considerations

Q&A



U.S. International Trade Commission

- Established in 1916 as the U.S. Tariff Commission.
- Independent, nonpartisan, quasi-judicial agency.
- Serve both executive and legislative branches with economic analysis.
- Six commissioners serve 9 year terms.



What we do

- Administer U.S. trade remedy laws within our mandate in a fair and objective manner.
- Maintain the Harmonized Tariff Schedule of the United States.
- **Provide the President (USTR) and Congress with independent research and analysis on international trade – most also available to the public.**
- The USITC does NOT make policy and does NOT negotiate trade agreements.



USITC fact-finding studies (332s)

- How studies get requested
 - *USTR, House Ways & Means, Senate Finance Committees*
- What studies contain
 - *Request letter*
- How studies are conducted
 - *Desk research*
 - *Domestic and international fieldwork*
 - *Public hearing*
 - *Written submissions*
 - *Economic literature review*
 - *Quantitative analysis*



Global Economic Impact of Missing and Low Pesticide Maximum Residue Levels

- Requested by USTR on August 30, 2019
- Completed in two volumes
 - Volume 1 (bullets 1 through 6) due on **April 30, 2020**
 - Volume 2 (bullets 7 and 8) due on **October 30, 2020**
- These public reports will be posted on USITC website.



Pesticides & MRLs

- Pesticides are important tools in crop production
- Pesticide residues impact food safety
- MRL = highest legal level of pesticide residue permitted on food
- Commodity & pesticide pair (cranberries & chlorothalonil)
- MRLs may be set by countries, trade blocs (e.g. EU), by international bodies (Codex)
- MRLs can impact agricultural trade, particularly when they are low or missing



Global Economic Impact of Missing and Low Pesticide Maximum Residue Levels

- Provide an **overview of MRLs** and their role in global agricultural production and trade.
- Describe **how MRLs are set** by countries, regions, and international bodies.
- Describe **how MRL policies are developed and administered** in major markets for U.S. exports. Identify trade facilitative practices.
- Describe **challenges and concerns of exporting countries** in meeting importing country MRLs. Explain why MRLs are missing or low.
- Describe **costs and effects of MRL compliance and noncompliance** for producers through case studies.
- Provide a **review of the economic literature** related to MRLs.
- **Assess how missing and low MRLs affect production, exports, farmer income, and prices** - qualitatively and quantitatively.



Missing and low MRLs

Missing

- Pesticide for use on certain product not permitted
- A product is not produced in importing market (no domestic standard/MRL)
- Newly developed pesticide not yet registered
- Established pesticide MRL withdrawn

Low

Apple – Pesticide X	Domestic Market	Market A	Market B
MRL	5 ppm	2 ppm	0.01 ppm



Missing and low MRLs: barriers to trade

If a commodity is shipped but does not meet the importing country MRL, trade may be interrupted.

- shipments may be seized, delayed, rejected, or destroyed at the port of arrival
- increased sampling for residue analysis may be required
- regulatory enforcement actions /penalties possible
- shipper may suffer reputational risk

Missing and low MRLs: costs and effects



- Producers face loss of preferred crop protection tools
- Crop impacts – yield, product quality, increased pest/disease resistance
- Exporters locked out of certain lucrative markets
- Disproportionate impact on specialty crops (high cost of establishing MRLs prohibitive for small industries)
- High cost & timeline for developing alternative pesticides

USTR's request letter



Volume I contains a literature review...

*(6) A review of the economic literature that assesses both **qualitatively and quantitatively** how **missing and low** MRLs affect **countries representing the range of income classifications, particularly low income countries**, with regard to **production, exports, farmer income, and prices**.*

...which informs the modeling for Volume II

(8) To the extent possible, quantitatively and qualitatively assess how missing and low MRLs affect production, exports, farmer income, and prices, both on the national level and, to the extent possible, for small and medium size farms.

Economic analysis of MRLs: overview



- Read, summarize, and understand the core MRL literature
- Supplement with other types of economic literature
- Connect findings with policy and cost/effects framework
- Develop modeling approaches for Volume II based on established methodologies and data, other information, agency experience



Core MRL literature

- Part of standards and trade literature
- Fundamental question: what are the trade effects of low/different MRLs?
- Use gravity model to discern the effects of MRLs on observed trade values in past years
- Stringency vs. heterogeneity approach
 - **Stringency** focuses on the level of the importer's MRL (*e.g. Wilson and Otsuki (2004)*)
 - **Heterogeneity** focuses on relative differences in MRLs between countries (*e.g. Drogué and DeMaria (2012)*)

Core MRL literature findings



- Three big outcomes
 - **"Standards as a barrier"**: Stricter importer MRLs cause trade to be lower (*e.g. Ferro et al. (2015)*)
 - **"Standards as a catalyst"**: Stricter importer MRLs cause trade to be higher (*e.g. Xiong and Beghin (2014)*)
 - **Relative differences** in MRLs cause trade to be lower (*e.g. Hejazi et al. (2018)*)
- Country-specific effects
 - Low-income exporters experience greater adverse effects
 - Mixed high-income exporter effects
- Limitations
 - Results: Trade only – no production, price, or income effects
 - Explanation: Do not provide in-depth qualitative analysis
 - Presentation: Results are not always explainable in an intuitive way



Additional literature

- Effects of pesticide use on production
 - Pesticide use has net positive effects on crop yields
 - Diminishing returns
 - Negative effects not inherently borne by farmer
- Low-income country challenges with high standards
 - Stringent SPS measures in high-income countries have an outsized effect on developing countries
 - Compliance costs are relatively steeper in countries with weaker institutions and less developed agricultural and food supply chains
 - Intensive margin effect is greater
 - But it's not clear what actually is driving these trends
- Price effects of policy uncertainty



Methodological takeaways

- Gravity model is useful for assessing trade effects of policies with no obvious tariff equivalent
- Stringency, heterogeneity, or both?
- Missing MRL treatment?
- How to aggregate MRLs by product?
- Trade effects could be negative or positive
 - E.g. Hejazi, Grant, and Peterson (2018) shows different effects of MRLs on U.S. exports depending on their destination market (EU vs. TPP)
- Price, income, production effects need modified methodologies or extensions



Questions?



Thank you