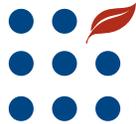


The logo for the United States Department of Agriculture (USDA), featuring the letters "USDA" in a white serif font above a stylized white wave graphic.

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The word "Outlook" in a red, italicized serif font, set within a white oval shape on a dark blue background.

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Regulatory Barriers in International Horticultural Markets

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Abstract

Sanitary and phytosanitary measures adopted by countries to protect plant or human health can affect patterns of trade in horticultural products by increasing the costs of imports or prohibiting them entirely. To prevent the protectionist use of such measures to shield domestic producers from competition—rather than to avert genuine hazards—countries participating in the Uruguay Round trade negotiations agreed to multilateral rules to govern their use. These rules have lowered many unnecessary barriers to horticultural trade, primarily through requirements that regulations be transparent and based on science. To quantify the benefits of continued regulatory reform, further research is needed to assess the trade and welfare effects of sanitary and phytosanitary measures in horticulture markets.

Keywords: Sanitary and Phytosanitary measures, horticulture, trade.

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Introduction

Sanitary and phytosanitary (SPS) measures adopted by countries to protect plant or human health can affect patterns of trade in horticultural products by increasing the costs of imports or prohibiting them entirely. Plant health (phytosanitary) measures are generally more trade restrictive than food safety (sanitary) measures for this group of commodities. To reduce the risk of introducing exotic plant diseases or pests, countries frequently ban imports altogether or adopt import protocols that require substantial public and private investments in the exporting country. For example, an import protocol to decrease the likelihood of a destructive fruit fly entering the importing country could require the government to conduct frequent field surveys and producers to build special packinghouses. In contrast, food safety measures are more often in the form of product or process standards that may increase foreign producers' costs relative to domestic producers' costs, but do not further restrict imports. Examples include a maximum residue level for a pesticide (product standard) or the required use of filters for irrigation water (process standard).

When SPS measures restrict imports, they insulate an importing country's domestic market from the world market. In these instances, domestic consumer and producer prices rise relative to world market prices, affording the domestic industry a measure of import protection. During the last round of multilateral trade negotiations, exporters voiced concerns that SPS measures were sometimes used to shield domestic industry from foreign competition rather than from genuine hazards, and that such protectionist pressures would increase as other trade barriers, such as tariffs, were reduced. Countries therefore adopted the Agreement

on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) under the auspices of the World Trade Organization (WTO) in 1995. The SPS Agreement provides a set of multilateral rules that would recognize the legitimate need for countries to adopt SPS regulations while establishing a framework to reduce the regulations' trade-distorting aspects.

The SPS Agreement reiterates earlier commitments under the General Agreement on Tariffs and Trade (GATT) and the Tokyo Round Agreement on Technical Barriers to Trade to apply technical restrictions only to the extent necessary and to avoid unjustifiable discrimination among members where identical or similar conditions prevail. Beyond these general requirements, the SPS Agreement sets out more specific obligations. These rules require countries to (1) provide notification through the WTO of proposed regulations that affect trade (transparency); (2) use scientific risk assessment to inform regulatory decisions (science-based risk management) while allowing national determination of the level of SPS protection (national sovereignty); (3) recognize that different measures can achieve equivalent safety outcomes (equivalence); and (4) allow imports from regions that are free or nearly free of pests or diseases (regionalization). Adoption of international standards (multilateral harmonization) is encouraged, but not required. Dispute settlement is available when WTO countries are unable to resolve differences through bilateral negotiations. If countries are unable to resolve differences in formal consultations, the first step of the WTO dispute-settlement process, the exporting country may request a panel to hear its complaint. Either party to the dispute may appeal the panel's ruling to the WTO's Appellate Body.

Implementation of the SPS Agreement

The evidence indicates that the SPS Agreement spawned a broad-based "regulatory review" when it came into effect in 1995, as major agricultural importers and exporters began to assess whether they and their trading partners were complying with the new rules (Roberts, 1998). As a result of this review, several measures restricting trade in fruits and vegetables were unilaterally revised following technical consultations. For example, Japan agreed to rescind its 46-year-old ban on several varieties of tomatoes grown in the United States based on scientific research indicating that the tomatoes were not afflicted with tobacco blue mold disease (USDA). New Zealand authorities officially recognized the equivalence of hot forced air treatments to treatment with a prohibited fumigant, thereby allowing several South Pacific countries to resume exporting mangos, papaya, and eggplant to their market (WTOb). Chile's decision to allow imports of fresh melons and watermelons from all production areas in the United States except Hawaii provides an example of the trade effect of the regionalization approach to mitigating pest risks (WTOa).

In many cases, a change in an SPS import regime was attributable to more than one provision of the SPS Agreement. For example, the United States agreed to lift a longstanding ban on Mexican avocados following a risk assessment indicating that produce imported from specified regions and subject to a series of other quarantine measures would pose negligible phytosanitary risks to U.S. production areas (Roberts, 1997).

More systematic information about member countries' regulations is now available because the SPS Agreement requires notification of regulatory changes affecting trade to the WTO. Fewer than one-fourth of WTO member countries (34 of 141) notified the WTO of changes in horticultural SPS measures between 1995 and 2000, but these countries included some of the largest importers and exporters of fruits and vegetables, including the United States, the European Union, Mexico, and Chile. Over these 6 years, 291 (of nearly 1,800) SPS notifications were related to trade in horticultural products. More than 90 percent of the notifications indicated changes in measures affecting fresh rather than processed products (table 1).

Slightly more than half of the horticultural notifications cited "food safety" as the objective of the

changes, with the United States and Canada accounting for most of the food safety-related measures. Generally, these notifications proposed changes in the maximum residue level (MRL or tolerance) for a particular pesticide, herbicide, or fungicide on individual fruits and vegetables. In most cases, the U.S. notifications stated that regulators proposed to approve new uses of existing inputs or the use of new inputs. However, in some instances, the U.S. notifications indicated that the Environmental Protection Agency (EPA) was reviewing tolerances to comply with the 1996 Food Quality Protection Act (FQPA), which required the agency to re-examine the health effects of residues. Of the remaining food safety notifications, 17 were related to measures to reduce microbial contamination in processed and dried products, 3 were related to the use of additives in juices, and 2 proposed approval for imports of food processed from potatoes that had been altered using gene technology.

The trade effect of these regulatory changes is difficult to ascertain. In most instances, the measure expanded, rather than restricted, production technologies available to producers. However, one cannot therefore conclude that such measures increased imports because, even if they permitted entry of products previously excluded from the domestic market, they might also improve the competitiveness of domestic producers relative to foreign producers. Moreover, it is difficult to know what the net effect of different regulations is without further study. For example, even though the United States may allow a greater number of pre- and post-harvest treatments on produce, as of January 2002, it requires fruit and vegetable juices to be processed using a Hazard Analysis and Critical Control Points (HACCP) system to reduce microbial contamination. Exporters in countries that do not require HACCP for domestic production must either invest in risk reduction technology to maintain access to the U.S. market or divert their products to countries without HACCP requirements. Only the latter option may be viable for exporters in some developing countries currently lacking adequate laboratory, inspection, and certification infrastructure. Without more detailed information about the relative cost structure of domestic and foreign industries, it is difficult to determine the net effect of food safety measures on horticultural trade patterns or even to ascertain the qualitative impact on the total volume of imports.

The notifications on plant health measures provide a clearer picture of the SPS Agreement's impact on produce trade. To mitigate pest risks, regulators generally use a bilateral "positive list" approach, excluding all commodities from all sources except for individual products from specific sources approved for import. Notified changes in phytosanitary policies generally indicate increased market access for a product from a specific country or region under certain conditions. There are exceptions. An importing country may temporarily suspend market access following a disease or pest outbreak in an exporting country. Nonetheless, most of the 128 notifications for phytosanitary measures for horticultural products between 1995 and 2000 expanded trade opportunities for exporters.

The number of phytosanitary notifications is likely a conservative indicator of the Agreement's effects on produce trade. Accomplishment reports from USDA's Animal and Plant Health Inspection Service (APHIS) cite regulatory changes in 49 instances that increased market access for U.S. produce during 1996-99. The

WTO was not notified about many of these changes. For example, when Japan lifted its aforementioned ban on several varieties of tomatoes from California and Florida in 1999, it did not notify to the WTO. Since then, U.S. tomato exports to Japan have steadily increased, expanding in value from under \$10, 000 in 1993 to over \$4 million in 2000, mostly to the food-service sector.

There appear to be two reasons for the underreporting of trade-expanding changes in phytosanitary policies. First, some countries have interpreted the mandate to notify the WTO of all SPS measures affecting trade as an obligation to notify only those that restrict trade. Second, many countries consider it unnecessary to notify the WTO of a regulation that affects the exports of only one trading partner who already knows of the measure through official bilateral channels. Members are more likely to notify the WTO when measures resolve prominent disagreements or signal a broad shift in phytosanitary policy.

Table 1—Regulatory objective of measures notified to WTO, by product

	Fresh			Processed			Fresh and processed			Total
	Fruit	Vegetables	Both	Fruit	Vegetables	Both	Fruit	Vegetable	Both	
<i>Number of SPS Notifications</i>										
Food safety	37	40	60	10	5	4	2	1	4	163
Plant health	61	38	26	--	--	--	2	--	1	128
Total	98	78	86	10	5	4	4	1	5	291

-- = Not applicable.

Sources: WTO(a) and authors' calculations.

Impact of International Standards on International Horticultural Markets

The SPS Agreement urges the widest possible harmonization of countries' SPS measures based on internationally recognized standards. The agreement identifies three organizations to promote this objective: the Codex Alimentarius Commission (Codex) for food safety measures, the International Plant Protection Convention (IPPC) for plant health measures, and the International Office of Epizootics (OIE) for animal health measures. The Agreement's endorsement of harmonization stems from repeated complaints by exporters that complying with divergent SPS measures substantially increases the transaction costs of trade, particularly for fresh produce and animal products.

The net benefits of harmonization to exporters will be positive if the revenues from additional market access exceed the costs of complying with the international standard. These net benefits are usually considered large compared with those of regionalization or equivalence, as the former usually permit greater economies of scale in both production and certification. Consumers may also benefit from harmonization if eliminating regulatory heterogeneity among countries lowers prices and expands product choice by allowing more products into the domestic market.

Despite the potential advantages of harmonization, its impact on horticultural trade appears to be constrained by both the insufficient number and infrequent adoption of international standards, particularly Codex standards. Between 1995 and 2000, more than 70 percent of the food safety notifications reported that no international standards existed for the referenced measures (table 2). The character of international stan-

dards as a public good has traditionally led to underinvestment in their creation. This underinvestment leads not only to too few international standards, but to too many outmoded standards, which may account, in part, for the low adoption rate for those international standards that do exist. Fewer than half (18 of 41) of the fruit and vegetable notifications indicating that Codex standards existed reported full or partial adoption of these standards.

The nature of international standards is also important in assessing their impact on trade. Although more plant health notifications than food safety notifications reported the existence and adoption of international standards, one cannot conclude that IPPC's standards have necessarily expedited horticultural trade more than Codex standards since the Agreement came into effect. Most of the IPPC's resources have historically been allocated to the development of metastandards—which identify common approaches to risk identification, assessment, and management—rather than to international standards per se. In fact, the IPPC has not yet produced one commodity-specific standard, although some are under development. Anticipated gains to exporters from international metastandards may be smaller than from international standards because, even if an importing country has used the IPPC's endorsed methodology to determine the pest status of an exporting country, for example, its measures may vary from those of other importers. International plant health standards have, therefore, contributed to the trading system by setting out scientific approaches to regulation, not by establishing measures that are the same across countries.

Table 2—Harmonization of measures regulating fresh and processed fruits and vegetables, 1995-2000

Regulatory goal	Adopted international standard or less restrictive measure	Did not adopt international standard	Partially adopted international standard	International standard does not exist	Unknown ¹	Total notifications
Food safety	7	23	11	116	6	163
Plant health	40	1	2	77	8	128
Total	47	24	13	193	14	291

¹The member did not respond to the question regarding adoption of an international standard, guideline, or recommendation.

Sources: WTO(a) and authors' calculations.

Disputes Over SPS Measures

When technical exchanges between regulatory officials in the importing and exporting countries reach an impasse, a country may choose to raise the matter for discussion in the WTO SPS Committee as an interim step before pursuing its rights in the WTO's formal dispute settlement process. Countries registered 33 complaints related to SPS restrictions on horticultural products in the Committee during 1995-2002 (table 3). The origin and number of the complaints in the first years of the Agreement's implementation are starkly different from those of more recent years. The United States and the EC initiated the only 3 complaints made in 1995-96, while developing countries in Asia, Latin America, and Africa account for 11 of the 16 complaints that were registered in 2001-2002. Most of the complaints (20 of 33) target the measures of developed countries, primarily the EC (8), Australia (4), and Japan (4). The United States has brought more complaints (7) to the SPS Committee than any other country.

The distribution of complaints across product categories is similar to the distribution of notifications across product categories. The number of complaints against measures regulating imports of fresh produce (30) far outnumber those that reference processed products (2).¹ Within the fresh produce category, complaints against measures that regulate fruit imports (18) outnumber measures governing the entry of vegetables (6) or both fruits and vegetables (6). However, the similarity between the distribution of notification and complaint data does not extend to the distribution of measures across regulatory objectives. Food safety measures accounted for more than half of the notifications but only 5 of the 33 complaints (or 15 percent), providing evidence in support of the view that plant health measures are more significant impediments to trade in horticultural products than food safety measures.

Since 1995, countries have reported the resolution or partial resolution of six trade complaints raised in the SPS Committee before these complaints advanced to formal dispute settlement (table 3). Negotiated settlements increased access for exports of (1) New Zealand fresh fruit to Indonesia; (2) Hungarian apples, pears, and quinces to the Slovak Republic; (3) EC and Polish potatoes to the Slovak Republic; (4) U.S. fruit

to Chile; (5) Argentine citrus to the EC; and (6) EC potatoes to the Czech Republic.

Five cases related to horticultural products have advanced to formal dispute settlement since 1995. The United States was the complainant in the first three cases. The U.S. complaint against Korea's import clearance measures, which included fruit fumigation, testing, and sorting requirements, was resolved at the first stage of dispute proceedings, in bilateral consultations. The U.S. complaints against Japanese testing regulations and Japanese quarantine regulations for apples both advanced to WTO panels and the WTO Appellate Body.

In the U.S.-Japan Testing dispute, the United States challenged the scientific basis of compulsory testing of treatment effectiveness on several horticultural products, primarily stone fruit and walnuts. Japan required exporters to test whether methyl bromide treatments effectively exterminated codling moths on each new variety of fruit or nuts before allowing import. The significant costs of the tests discouraged U.S. exporters from marketing new hybrids in Japan. The WTO concurred with U.S. arguments that the requirement of new data for each new plant variety was not supported by science because there is no evidence that the effect of fumigation varies with plant variety. Hence, the WTO ruled that there was no scientific basis for Japan's requirement and that Japan had not fulfilled its obligation to base its SPS measures on a risk assessment. It also ruled that the measures were not transparent as Japan failed to meet the conditions for publication set out in Annex B of the Agreement. Japan's argument that the measure was temporary was not accepted, as it had been in effect for 48 years. Even if the measure had been accepted as temporary, the WTO ruled that requiring exporters to supply data did not fulfill an importer's obligation under the Agreement to seek additional information to complete a risk assessment. The Appellate Body issued its ruling in the case in February 1999, and the parties to the dispute finally settled the case in August 2001.

The U.S. brought its complaint against Japanese requirements (chlorine dip, cold treatment, and orchard inspections by Japanese phytosanitary authorities) for imported apples to a WTO panel for resolution in 2002. A WTO panel concurred with the United

¹Brazil's complaint against the EU's proposed MRLs for the pesticide dimethoate references both fresh fruit and fruit juices.

States that these measures violated the SPS Agreement, primarily because there was no scientific basis for the requirements. The WTO Appellate Body upheld the panel's findings in November 2003. Most other countries accept the U.S. systems approach (which includes good commercial production practices, grading and sorting, and visual inspection for pests) as adequate for mitigating the risk of diseases and pests affecting apples, such as fire blight and

codling moth. One risk assessment estimated that there was a likelihood of one fire blight outbreak every 11,364 years under the U.S. protocol. If Japan were to accept U.S. quarantine measures, Japanese apple imports would increase by an estimated 22,000 to 88,000 metric tons, or as much as 14 percent of U.S. apple exports, under different assumptions about demand and supply elasticities (Calvin and Krissoff, 1998).

Table 3—Complaints in the WTO SPS Committee against measures regulating imports of fresh and processed fruits and vegetables, 1995-2000

Respondent	Complaint	Raised by	Supported by	Issue first raised	Status (if reported)
US	Detention of cantaloupe due to salmonella contamination	Mexico		Nov. 2002	
EC	MRLs for the pesticide dimethoate on fruits and in fruit juices	Brazil	Argentina, Uruguay, Bolivia, Dominican Republic, Jamaica, Mexico, and Cuba	Nov. 2002	
Japan	Required fumigation for non-quarantine pests on citrus and other fresh fruits and vegetables	New Zealand	U.S., EC, Australia	June 2002	
Brazil	Import requirements for seed potatoes	EC	Canada	June 2002	
Venezuela	Import requirements for fresh potatoes, mushrooms, and tomatoes	Argentina	Chile, United States, Canada	Mar. 2002	
China	Import requirements for apples, pears and citrus	Argentina		Mar. 2002	
US	Import conditions for clementines	EC		Mar. 2002	
Cuba	Restrictions on apples and pears	Argentina		Oct. 2001	
EC (Canary Islands)	Restrictions on apples and pears	Argentina		Oct. 2001	
EC	MRLs for pesticides on fruits and, vegetables, especially pineapples	Cote d'Ivoire		July 2001	
EC	MRL for the thiabendazole in fruit juices	Israel		July 2001	
EC	Measures that severely restrict imports of potatoes	Egypt		July 2001	
Turkey	Restrictions on banana imports	Ecuador		Mar. 2001	Resolved following consultations under formal dispute settlement procedures
Australia	Access of California table grapes	United States	ASEAN	Mar. 2001	
EC	Sampling methods for aflatoxins in dried fruits (as well as other products)	Argentina	Bolivia, India	Mar. 2001	
Venezuela	Venezuela's phytosanitary requirements for garlic and potato imports	Argentina		Mar. 2001	
Indonesia	Restrictions on importation of fresh fruit	New Zealand		Nov. 2000	Resolved
Australia	New temperature requirements for methyl bromide treatments for fresh produce (as well as other products)	EC		Nov. 2000	
Australia	Import restrictions on durian	Thailand	EC, India, Philippines	Nov. 2000	

See notes at end of table.

Table 3—Complaints in the WTO SPS Committee against measures regulating imports of fresh and processed fruits and vegetables, 1995-2000—Continued

Respondent	Complaint	Raised by	Supported by	Issue first raised	Status (if reported)
Australia	Restrictions on imports of tropical fresh fruit, (including mangoes, bananas, and pineapples)	Philippines, ASEAN	Brazil, EC, India, Korea, Malaysia, Thailand, U.S.	Mar. 2000	Panel established in Aug. 2003
United States	Imports of citrus fruit	Argentina		Nov. 1999	
Japan	Import measures to control non-quarantine pests	United States	Australia, Canada, ASEAN, Uruguay, Chile, EC, New Zealand	Nov. 1998	Unresolved
Slovak Republic	Restrictions on imports of apples, pears, and quinces	Hungary	EC, Bulgaria	Mar. 1998	Partially resolved
Slovak Republic	Import restrictions on potatoes	EC, Poland	Argentina, Chile, Hungary	Mar. 1998	Resolved
Brazil	Import prohibition of desiccated coconut	Philippines	Malaysia, Sri Lanka	June 1998	
Japan	Plant quarantine regulations, including fire blight measures for imported apples	United States	New Zealand, Chile	Mar. 1997	The WTO panel and Appellate Body ruled against Japan's measures
Chile	Restrictions on imports of fruit from areas designated as free of fruit flies (<i>anastrepha fraterculus</i> and <i>ceratitis capitata</i>)	United States		Mar. 1997	Partially resolved ¹
EC	New restrictive measures for imports of citrus from third countries where citrus canker is present (because restrictions on intra-EC movement of produce were liberalized)	Argentina	Brazil, Chile, South Africa, Uruguay	July 1997	Partially resolved
EC	Elimination of protected zones within EC leading to more restrictive phytosanitary requirements for citrus Imports	Uruguay	Chile, Mexico, South Africa	Mar. 1997	
Indonesia	Fresh fruit and vegetables	Australia, United States		Mar. 1997	
Czech Republic	Imports of potatoes	EC	Argentina	Oct. 1996	Resolved
Japan	Requirements for testing each variety of apples, cherries, and nectarines for efficacy of methyl bromide in eliminating codling moth	United States		Oct. 1996	Negotiated solution in Aug. 2001 following panel and Appellate Body rulings against Japan's measures
Korea	Import clearance procedures, including fruit fumigation, testing, and sorting requirements	United States	Several delegations	June 1995	Resolved following consultations under formal dispute settlement proceedings

¹Chile now allows imports of U.S. raspberries; grapes, kiwis, avocados, and lemons from California; and apples and pears from Washington. New measures that would allow imports of other U.S. fruits, including citrus from California and Arizona and apples and pears from Oregon, are under consideration.

Sources: WTO(b) and WTO(c).

Conclusions

An assessment of the SPS Agreement's impact on horticultural trade should first recognize what has not occurred since the Agreement went into effect in 1995—a flood of protectionist SPS measures supplanting traditional trade barriers as they are phased out over time. The Agreement's intended deterrence of regulatory protectionism, therefore, can be credited with protecting the potential gains from trade liberalization that were negotiated during the Uruguay Round.

The SPS Agreement's requirements for science-based SPS regulation, recognition of equivalence, and regionalization have demonstrably increased export opportunities for producers in some instances. The SPS disciplines have not only increased market access for countries that have internationally recognized biosecurity regimes, but have also helped poorer countries, such as Argentina and Mexico, that rely on agricultural exports to generate foreign exchange. Quantitative estimates of the gains from trade for cases of SPS regulatory reform are rare. But if the estimates of the effects of changes in Japan's fire blight measures are indicative of potential gains, continuing modification of SPS policies will lead to sizable global benefits for both exporters and consumers, although domestic producers will suffer losses. The early examples of regulatory reform will also likely have important multiplier effects over time, spurring additional research on time/temperature regimes, seasonal variation in insect populations, and water treatments, which will lead to further expansion in horticultural trade.

The impact of international standards on horticultural trade since the Agreement came into effect appears to be limited. One clear impediment to harmonization has been the lack of relevant standards. The Codex Commission has proposed to remedy this shortcoming by increasing the frequency of its meetings, increasing

the number of working groups to address new issues, and adopting a "fast track" approval procedure for some standards. If adoption rates for the new standards are high, the impact of harmonization on horticultural trade will be greater than it has been in the past. Yet such assessments must be moderated by the recognition that the most significant barriers to produce trade—plant health regulations which stipulate multiple process standards to mitigate risks that vary by destination as well as by source—are generally less amenable to harmonization than food safety measures such as MRLs for pesticides and additives.

The procedural obligations of notification and dispute settlement have clearly reduced the degrees of freedom for the disingenuous use of SPS measures to restrict imports in response to pressure by interest groups. The contribution of these obligations to the integrity of world horticultural markets should not be underestimated. The requirements for transparency of regulatory regimes have made it easier to identify and track contentious regulations, the discussion among trading partners in the SPS Committee pressures countries to weigh the benefits and costs of regulation more carefully than they otherwise would, and the demonstration effect of dispute rulings engenders reform of other regulations.

Scientific developments, new technologies, and evolving consumer preferences will continue to push SPS measures to the center of the trade policy debate. To inform this debate, more research is needed to quantify the trade and welfare effects of alternative SPS measures in horticultural markets. Progress on this research agenda lags far behind similar efforts to assess the impacts of traditional trade barriers. But if the SPS Agreement is to fulfill its potential in serving the goal of welfare enhancement through trade, this research challenge must be met.

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