United States General Accounting Office

GAO

Report to the Chairman, Committee on Agriculture, House of Representatives

June 1992

PESTICIDES

Comparison of U.S. and Mexican Pesticide Standards and Enforcement

GAO/RCED-92-140

GAO

United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-247786

June 17, 1992

The Honorable E (Kika) de la Garza
Chairman, Committee on Agriculture
House of Representatives

Dear Mr. Chairman:

This report responds to your request that we examine U.S. and Mexican differences in pesticide registration, tolerance levels for food-use pesticides, and enforcement efforts to ensure that Mexican produce exported to the the United States meets U.S. residue standards.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to the Administrator, Environmental Protection Agency; the Commissioner, Food and Drug Administration; the Mexican Embassy; and other interested parties. We will also make copies available to others upon request.

This report was prepared under the direction of Richard L. Hembra, Director, Environmental Protection Issues, who may be reached at (202) 275-6111 if you or your staff have any questions. Other major contributors to this report are listed in appendix V.

Sincerely yours,

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

Mexico accounts for nearly one-half of all fresh and frozen fruits and vegetables exported to the United States. If current free trade negotiations between the United States and Mexico are completed successfully, the level of imported Mexican produce (fresh fruits and vegetables) may increase significantly. This anticipated rise has heightened concern that pesticide use may increase and residue levels on Mexican produce may exceed U.S. limits if growers attempt to maximize production with these new opportunities for agricultural exports.

To provide information on this issue, the Chairman of the House Committee on Agriculture requested, among other things, that GAO (1) compare U.S. and Mexican requirements for pesticide registration and tolerances (allowable levels of pesticide residues), (2) examine U.S.-Mexican differences in tolerances on produce exported to the United States, and (3) compare the methods Mexico and the Food and Drug Administration (FDA) use to ensure safe levels of pesticide residues on produce entering the United States from Mexico.

Background

The United States, Mexico, and Canada are negotiating a North American Free Trade Agreement (NAFTA). The agreement would phase out tariffs and nontariff trade barriers, such as pesticide residue standards that are not scientifically based. Whether or not an agreement is signed, pesticide standards on produce will most likely play a more important role in trade as food imports from Mexico and other countries continue to increase.

In the United States, the Environmental Protection Agency (EPA), FDA, and the U.S. Department of Agriculture (USDA) share the responsibility of regulating pesticides to ensure that pesticides, when used properly, do not pose an unreasonable risk to human health and the environment. EPA registers and sets tolerances for pesticides on all foods. FDA monitors most food for compliance with the tolerances, except meat, poultry, and eggs, which are the responsibility of USDA. In Mexico, the Commission for the Control of the Production and Use of Pesticides, Fertilizers, and Toxic Substances (CICOPLAFEST) has the same registration and tolerance responsibilities as EPA. Mexico has no government agency responsible for enforcing and monitoring pesticide residues.

Tolerances are the maximum limits of pesticide residues that are allowed in or on foods. They represent a residue level low enough to be safe when the food is consumed and high enough to cover residues that may be

present if the pesticide is properly used. A food-use pesticide can have many tolerances to cover each of the many foods it can be used on.

Results in Brief

The United States and Mexico have developed similar requirements for regulating pesticides. In each country one government body—EPA and CICOPLAFEST—uses an application process that reviews data as the basis for granting or denying a pesticide registration and setting tolerances. However, EPA does not rely on the reviews of data that other developed nations can offer for a particular pesticide, while CICOPLAFEST will use these foreign reviews and data in its review process.

A number of differences in tolerances exist between the United States and Mexico. Officials from both countries have formed a working group to resolve these differences to the extent possible. There are three categories of differences: (1) pesticides that have tolerances in both countries but have Mexican tolerances for some commodities without comparable U.S. tolerances (58); (2) pesticides that have tolerances in Mexico but not in the United States (17); and (3) pesticides that have tolerances in both countries for the same commodities, but the tolerances are set at different levels. The working group plans to address the first two categories but not the third. Also, the working group has no long-term plan for addressing or preventing future tolerance differences that might develop between the two countries. Such a plan could provide a model for future discussions with other nations.

The United States and Mexico differ in the way they monitor for safe levels of pesticide residues on Mexican produce entering the United States. FDA has a sampling program to monitor imports and a special program to test Mexican produce for pesticide residues. In contrast, the Mexican government generally has limited monitoring capabilities for exported produce. Instead, the private sector has assumed responsibility for monitoring exports for safe levels of pesticide residues. However, a new government program to establish a network of residue-testing laboratories may help the government strengthen its role in monitoring residues on exported produce.

Other efforts also help ensure the safety of Mexican produce. FDA communicates regularly with Mexican officials about U.S. import regulations and provides educational and technical assistance on an array of subjects. Some Mexican growers are also employing an alternative

agricultural technique—integrated pest management—that may help reduce pesticide residues through nonpesticidal control programs.

Principal Findings

Pesticide Registration and Tolerance-Setting Requirements Are Similar

In both the United States and Mexico, one body is responsible for registering and setting tolerances. EPA registers and sets tolerances for food-use pesticides. To obtain a registration, an applicant provides EPA with data on, among other things, cancer-causing effects, chemical formulation, toxicity levels, and environmental impact. EPA grants or denies an application only on the basis of the data provided. EPA will not accept another country's registration as a substitute for its own review.

CICOPLAFEST requires similar information for its review process. However, if the pesticide is already registered by EPA and/or certain other developed countries, CICOPLAFEST will generally provide a less intensive review. If these foreign registration data do not account for Mexico's climatic conditions, CICOPLAFEST will request additional data before deciding to register the pesticide and establish its tolerance levels.

Officials Are Working to Resolve Differences in Pesticide Tolerances

U.S. and Mexican officials have formed a working group to address tolerance differences and have set broad priorities for the type of difference to address first. The group is considering various options for resolving the differences, such as (1) identifying other means of pest control or alternative pesticides with EPA tolerances that meet Mexico's needs and (2) extending the crop groupings to cover more commodities. (For example, for pesticides with EPA tolerances for oranges, it may be possible to set a tolerance to cover all citrus fruits.) However, because of the differences in growing conditions, some different needs for pesticide-commodity combinations may always exist.

Fifty-eight pesticides have tolerances for produce in both countries, but not necessarily for the same commodity. For example, the pesticide acephate has tolerances in both countries; however, two of the Mexican tolerances—for broccoli and cabbage—do not have corresponding U.S. tolerances. The working group is addressing these tolerance differences first because they may be easier to resolve since some EPA tolerances already exist. In addition, 17 pesticides with Mexican tolerances have no

U.S. tolerances, such as the pesticide azocyclotin. This pesticide has Mexican tolerances for apples, avocados, beans, and peaches, but no U.S. tolerances. Because EPA has not reviewed the data for these pesticides, resolving differences will be more difficult. The working group is not addressing a third category—those pesticides that have tolerances in both countries for the same commodities but at different tolerance levels. The group has also not developed a long-term strategy for addressing or preventing differences in tolerances that would occur because of continual changes in pesticides and tolerances.

Both Countries Are Working to Ensure the Safety of U.S. Imports

FDA developed a special monitoring program in 1979 in response to the increasing volume of Mexican produce entering the United States. Mexican produce found in violation of U.S. tolerances is to be either sent back to Mexico or destroyed.

The Mexican government, however, has limited monitoring capability. Instead, the private sector—Mexican and multinational companies and state and national growers' associations—monitors pesticide residues. These private entities generally test their food only as needed. To increase its monitoring capabilities, the Mexican government is establishing a national laboratory system to test residue levels. The system will have 11 laboratories; 5 are now functioning, according to Mexican officials. One laboratory is government-owned; the others will all be private. The government-owned laboratory, currently in operation, sets the standard for all the system's laboratories. Other efforts to ensure safe pesticide levels include a memorandum of understanding between FDA and the Mexican government to provide technical and educational assistance to Mexican growers and the use of integrated pest management.

Recommendation

GAO recommends that the Administrator of EPA and the Commissioner of FDA work with Mexican officials to develop a strategy for resolving, where possible, all types of pesticide differences. This strategy should also provide a long-term plan to deal with the changing field of pesticides.

Agency Comments

GAO discussed the facts in this report with EPA, FDA, USDA, and Mexican officials, who generally agreed with the information presented. Their comments were incorporated where appropriate. However, as requested, GAO did not obtain written agency comments on this report.

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Abbreviations

ARS	Agricultural Research Service
CICOPLAFEST	Commission for the Control of the Production and Use of Pesticides, Fertilizers, and Toxic Substances
EPA	Environmental Protection Agency
FDA	Food and Drug Administration
FFDCA	Federal Food, Drug, and Cosmetic Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
GAO	General Accounting Office
GATT	General Agreement on Tariffs and Trade
IPM	Integrated Pest Management
ITC	International Trade Commission
NAFTA	North American Free Trade Agreement
USDA	U.S. Department of Agriculture

Introduction

Pesticides are used all over the world to control and/or kill an enormous variety of unwanted plants or pests. Over the past 30 years, the types and amount of pesticides have dramatically increased. While pesticides are recognized as an important component in meeting the increasing demand for food and in the fight against insect-borne diseases, they also have the potential to create serious problems affecting human health and the environment. In addition, international disputes involving differences in health and safety measures for pesticides have disrupted agricultural trade between countries.

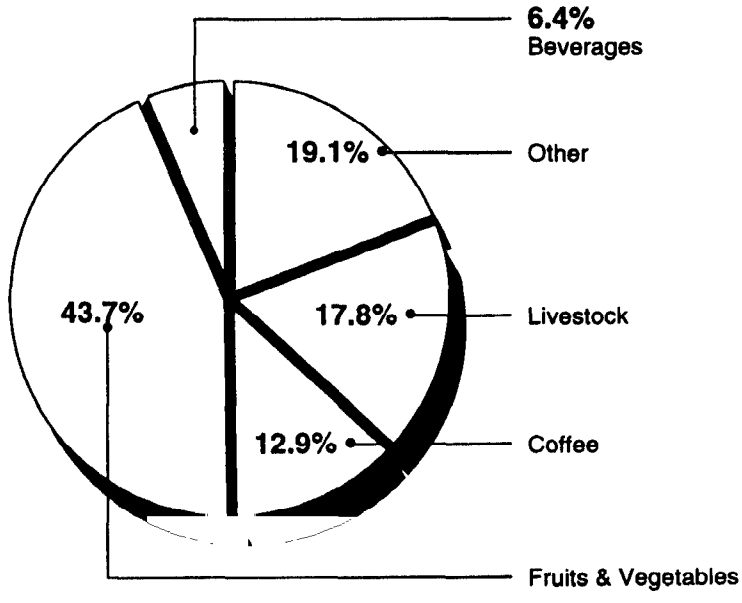
The United States, Mexico, and Canada are now negotiating a North American Free Trade Agreement (NAFTA) to increase trade among the three countries and to compete more effectively in the world market. In 1991, the Congress allowed NAFTA to proceed on "fast track."[1] If formed, this trade bloc will be one of many such regional trade blocs that are currently being proposed throughout the world. According to an official involved in the negotiations, pesticide standards play an important role in free trade discussions. Free trade, by definition, abolishes many traditional barriers to trade, such as tariffs and quotas. Therefore, there is concern that countries will turn to less traditional import barriers, such as pesticide standards that are unnecessarily high and not scientifically based, to block trade.

According to 1990 data from the the U.S. Department of Agriculture (USDA), Mexico supplies the United States with about one-half of its winter fruits and vegetables. According to the U.S. International Trade Commission (ITC), the agreement could generate significant increases in Mexican agricultural exports of fresh and processed fruits and vegetables to the United States. The ITC also predicts increases in U.S. exports of grain and oilseeds to Mexico; however, the expected growth will represent a small share of total U.S. production of grains and oilseeds. Furthermore, the ITC predicts that because Mexican producers are able to supply the U.S. market, at much lower costs, with many of the same products grown in the United States—particularly citrus crops and winter vegetables—U.S. growers (mostly in Florida and California) of these commodities will experience losses. Because the discussion on fruit and vegetable trade under NAFTA has focused on Mexico, not Canada, we have confined our analysis to comparisons between the United States and Mexico. Figure 1.1 shows Mexican exports to the United States; tables 1.1 and 1.2 show the

[1]In granting "fast track," the Congress delegates to the administration the authority to negotiate trade agreements and agrees to consider under expedited procedures (within 60 days) the implementing legislation for any agreements reached. Fast track also allows the Congress to vote only for or against the treaty as it is presented; the language of the treaty cannot be amended in any way.

volume of some competitive agricultural imports from all countries and the percentage received from Mexico.[2]

Figure 1.1: 1990 Mexican Agricultural Exports to the United States



Source: Agriculture in a North American Free Trade Agreement, USDA, April 1991.

[2]Competitive agricultural imports consist of imports similar to agricultural commodities grown commercially in the United States. All other commodities are considered noncompetitive.

Table 1.1: Volume of Some Competitive Fruit Imports and the Percentage Imported From Mexico, 1990

Competitive fruit imports (fresh or frozen)	Amount imported from all countries (in metric tons)	Percentage of these imports from Mexico
Melons	435,505	68.8
Grapes	373,550	7.0
Pineapples	115,583	3.4
Apples	106,142	0
Citrus	101,124	65.0
Mangoes	59,007	86.3
Strawberries	47,292	85.1
Other	221,379	7.6
Total	**1,459,582**	**34.5**

Note: According to a USDA official, these categories of commodities were developed in 1981 and reflect the top competitive imports that year. However, because of changing trade patterns, some commodities that are rolled into the "other" category may actually be imported now in larger quantities than those currently listed separately. The 1992 USDA data will reflect the current top imports.

Source: Foreign Agricultural Trade of the United States, Calendar Year 1990 Supplement, Economic Research Service, USDA.

Table 1.2: Volume of Some Competitive Vegetable Imports and the Percentage Imported From Mexico, 1990

Competitive vegetable imports (fresh or frozen)	Amount imported from all countries (in metric tons)	Percentage of these imports from Mexico
Tomatoes	360,993	97.6
Potatoes	281,715	0
Cucumbers	178,974	92.9
Onions	170,434	84.4
Peppers	135,874	93.1
Squash	78,400	95.3
Carrots	55,690	26.1
Peas	38,305	24.5
Asparagus	20,295	73.1
Beans	20,035	68.2
Garlic	17,829	43.2
Eggplant	16,287	99.8
Lettuce	13,321	72.6
Other	418,584	60.0
Total	**1,806,736**	**66.4**

Note: According to a USDA official, these categories of commodities were developed in 1981 and reflect the top competitive imports that year. However, because of changing trade patterns, some commodities that are rolled into the "other" category may actually be imported now in larger quantities than those currently listed separately. The 1992 USDA data will reflect the current top imports.

Source: Foreign Agricultural Trade of the United States, Calendar Year 1990 Supplement, Economic Research Service, USDA.

Pesticide Issues for the NAFTA Negotiations

The NAFTA negotiations have brought to light many environmental issues as they relate to international trade policy. Environmental groups believe that while NAFTA may offer an opportunity to strengthen environmental protection, it may also dictate the weakening or "harmonization" of environmental standards, including pesticide standards, toward an international lowest common denominator (and thus a reduction in food safety standards) in order to promote trade. They are also concerned that the opportunity for increased exports of Mexican winter fruits and vegetables may tempt Mexican farmers to misuse pesticides in an effort to maximize their production. In response to these concerns, the President issued a statement in May 1991 pledging that the United States would not agree to weaken existing environmental standards in the free trade agreement and would maintain enforcement of them.

Despite their concerns over NAFTA's impact on trade, U.S. growers from Florida and a Florida State official with whom we spoke believe that private Mexican growers and exporters have controls over their operations to minimize the number of pesticide violations on their produce exported to the United States. However, these agricultural officials believe that enforcement of Mexican pesticide standards and regulatory programs should come from either the Mexican state or federal government rather than private industry, which would make enforcement more consistent throughout Mexico. In their opinion, government enforcement of Mexican pesticide regulations would also contribute toward leveling the competitive playing field between the United States and Mexico by having government monitoring for pesticide residues on both sides of the border.

The Standards Working Group Examines Pesticide Standards in NAFTA

To work out the NAFTA details and to draft the language for the agreement, the negotiators have set up 18 working groups with representatives from Canada, Mexico, and the United States, according to U.S. officials involved in the negotiations. The Standards Working Group is composed of three subgroups, one of which discusses pesticide standards as they relate to trade. According to negotiators, the Standards Group is responsible for developing the basic principles concerning the role that standards should play in a free trade environment and for drafting language for the standards portion of the NAFTA agreement.

According to working group officials, the Standards Group agreed to use language developed during the Uruguay Round of talks under the General Agreement on Tariffs and Trade (GATT) as guidelines for its own negotiations.[3] Some of the major principles agreed upon in GATT for the role of pesticide standards in trade included the following:

- Procedures for setting pesticide tolerances should be based on science and that science should be based on internationally agreed-upon scientific principles.

[3]GATT was formed in 1947 as a forum for nations to reduce barriers to world trade and to help settle trade disputes. Its membership has grown; its member nations now account for nearly 90 percent of world trade. The current round of negotiations, the eighth in GATT's history, began in Uruguay in September 1986, and is thus known as "the Uruguay Round." This round was initiated to correct counterproductive and wasteful practices and to create a more effective climate for world trade. Currently, agricultural trade is exempt from many GATT rules. However, in the Uruguay Round, the liberalization of agricultural trade and its inclusion in GATT has been a key discussion point.

- Incorporating transparency[4] of operations provides the openness that is critical for a free trade environment.
- International pesticide standards should be strived for, but a country should have the right to impose more stringent standards if it can show that such stringency is necessary for health reasons and is founded on sound scientific principles. Countries should also have the right to decide what level of risk they are willing to accept from pesticide residues.
- Standards should not be used as disguised barriers to trade.

An Informal Working Group Is Discussing Pesticide Issues Between the United States and Mexico

According to Environmental Protection Agency (EPA), Food and Drug Administration (FDA), and USDA officials, they are holding other discussions with their Mexican counterparts, which are occurring separately from the NAFTA negotiations. These officials are discussing ways to (1) analyze and resolve to the extent possible differences in pesticide residue standards between the two countries and (2) educate Mexican growers on U.S. import regulations. This group was formed because of concerns about the pesticide residues found on Mexican imports that violated U.S. tolerances.

Rising Fruit and Vegetable Imports

Even without a NAFTA, agricultural imports from Mexico and other countries are continuing to increase. We reported in 1988 about the rising amounts of agricultural imports entering the United States from other countries, especially fruits and vegetables.[5] Specifically, the report stated that, from 1980 to 1986, U.S. fruit imports tripled and vegetable imports more than doubled in real value. More recently, according to USDA data, the United States imported over $100 million more fruit in 1990 than in 1989 and over $200 million more vegetables. As these imports continue to rise, pesticide standards, as they relate to both food safety and trade issues, may become increasingly important, especially if the NAFTA negotiations indicate a trend toward global free trade.

EPA and FDA Share Responsibility for Regulating Pesticides in Produce

EPA and FDA share responsibility for regulating the level of pesticide residues in domestic and imported produce. EPA (1) registers pesticides for use in the United States and (2) sets the tolerances for those pesticides. FDA enforces EPA tolerances on sampled foods, except meat, poultry, and eggs, which are the responsibility of the U.S. Department of Agriculture.

[4]According to negotiators, the Standards Group uses "transparency" to mean the willingness to share information and data.

[5]Agricultural Trade: Causes and Impacts of Increased Fruit and Vegetable Imports (GAO/RCED-88-149BR, May 10, 1988).

Tolerances are the maximum limits of pesticide residues that are allowed in or on foods. Tolerances represent a residue level that is low enough to be safe when the commodity is consumed and high enough to cover residues that may be present if the pesticide is used in accordance with good agricultural practices.[6] EPA generally establishes tolerances when a pesticide is registered if the produce will be used in the United States on food. However, in some cases, when a pesticide is used in another country but not in the United States and is therefore not registered in the United States, EPA will establish "import" tolerances for that pesticide on various commodities, which make residues of these pesticides legal, without registering the pesticide.

CICOPLAFEST Regulates Pesticides in Mexico

The Intersecretarial Commission for the Control of the Production and Use of Pesticides, Fertilizers, and Toxic Substances (CICOPLAFEST)—a commission composed of representatives from the four Mexican ministries involved in pesticide policy—is responsible for pesticide registration and tolerance-setting in Mexico. The Commission was created in 1987 as part of the current government's restructuring process. The four ministries represented in CICOPLAFEST are Health, Urban Development and Ecology, Agriculture and Water Resources, and Commerce and Industrial Development. CICOPLAFEST's basic data requirements for pesticide registration are similar to EPA's registration and tolerance-setting data requirements. Mexico has no government agency responsible for monitoring and enforcing pesticide residues.

Objectives, Scope, and Methodology

Because of the potential increase in produce coming from Mexico if the NAFTA is signed and passed, the Chairman of the House Committee on Agriculture asked us to (1) compare U.S. and Mexican requirements for pesticide registration and tolerances, (2) examine U.S.-Mexican differences in tolerances on produce exported to the United States, and (3) compare the methods used by Mexico and FDA to ensure safe levels of pesticide residues on produce entering the United States from Mexico.[7] As subsequently agreed, we also examined the use of the pesticide DDT in Mexico.

Because the pesticide debate under NAFTA has not focused on Canadian produce, and as agreed with the requester, we have confined our analysis

[6]"Good agricultural practices" are the authorized and recognized use of a pesticide, which is presumed to be a safe as well as an effective and reliable means of pest control.

[7]For this report, we use "produce" to mean fresh fruits and vegetables.

to comparisons between the United States and Mexico.[8] We did not incorporate an analysis of the differences between U.S. and Canadian procedures or pesticide tolerances into the scope of our report.

For information on pesticide registration procedures, we referred to our past reports and testimonies.[9] We also reviewed EPA's General Information on Applying for Registration of Pesticides in the United States, published by the Office of Pesticide Programs, Registration Division and interviewed EPA officials. In Mexico, we interviewed CICOPLAFEST officials and obtained CICOPLAFEST documents to learn about registration and tolerance requirements.

To identify pesticides that have tolerances in Mexico but not in the United States, we used USDA-generated data, which were developed from the U.S. Code of Federal Regulations (40 C.F.R. 180), The Pesticide and Toxic Chemical Newsguide, and the Official Catalogue of Registered Chemicals for Mexico (issued by CICOPLAFEST). We also examined a Mexican list describing pesticides that are currently without certain EPA tolerances. The Mexican government believes that these pesticides are critical to Mexican agriculture, and the list cites the food uses for which the pesticides are critical. In addition, we performed work at the following agencies:

- the Office of Pesticide Programs in EPA,
- the Agricultural Research Service at USDA,
- the Office of Regulatory Affairs and the Center For Food Safety and Applied Nutrition at FDA, and
- the Mexican Ministry of Agriculture and Water Resources in Mexico City.

We analyzed the pesticides that have some tolerances in Mexico and not in the United States and broke these into two categories: (1) those pesticides that have tolerances in Mexico but no EPA food-use tolerances and (2) those pesticides that have tolerances in both countries, but Mexico has tolerances for some commodities that the United States does not have. For our analysis of these different categories of pesticides, we used the same

[8]The pesticide debate has not focused on Canada for two major reasons. First, although Canada and Mexico, respectively, are the top two suppliers of agricultural imports to the United States, most of Canada's agricultural exports to the United States come in the form of live animals, meat, grain, and feed. Second, because of Canada's colder climate, Canada has less need for pesticides than the United States and Mexico.

[9]Pesticides: EPA's Formidable Task to Assess and Regulate Their Risks (GAO/RCED-86-125, Apr. 18, 1986); Guidelines Needed for EPA's Tolerance Assessments of Pesticide Residues in Food (GAO/T-RCED-89-35, May 17, 1989); Reregistration and Tolerance Reassessment Remain Incomplete for Most Pesticides (GAO/T-RCED-89-40, May 15, 1989).

USDA-generated data that the U.S.-Mexican group is using as a basis for its discussions.

To learn about Mexico's monitoring and enforcement procedures, we met with Mexican government officials from the ministries represented in CICOPLAFEST: Health, Urban Development and Ecology, Agriculture and Water Resources, and Commerce and Industrial Development. We interviewed officials from state agriculture ministries in the states of Guanajuato and Sinaloa. We also met with representatives from Mexican private agricultural industry, including multinational pesticide manufacturers in Mexico City, and various produce processing plants and large growing operations in the states of Guanajuato and Sinaloa. We met with a state growers' association in Sinaloa and interviewed officials from the Confederation of Mexican Fruit and Vegetable Growers (the Confederation), Mexico's largest national agricultural association. For additional information, we reviewed our past work on other countries' efforts to meet U.S. requirements on imported produce.[10]

We met with a Mexican Confederation official at the U.S.-Mexican border in Nogales, Sonora, to determine the role the Confederation has in facilitating the export of Mexican produce to the United States.

To determine how FDA monitors pesticide residues on Mexican produce, we interviewed FDA border inspectors in Nogales, Arizona, to obtain information on FDA's import monitoring program of Mexican produce. We visited FDA's pesticide residue monitoring laboratories in Dallas, Texas, and Los Angeles, California, to interview FDA chemists about pesticide violations in Mexican produce. In addition, we reviewed FDA's guidance on Pesticides on Mexican Produce and Pesticides and Industrial Chemicals in Imported Foods. We obtained violation data from the Division of Contaminants Chemistry in FDA headquarters. We also analyzed our past work on FDA's import monitoring program.[11]

We met with Florida growers and a California growers' association to obtain their opinions regarding NAFTA's potential impact on their operations and to obtain information on production practices used by these growers.

[10]Food Safety and Quality: Five Countries' Efforts to Meet U.S. Requirements on Imported Produce (GAO/RCED-90-55, Mar. 22, 1990).

[11]Pesticides: Better Sampling and Enforcement Needed on Imported Food (GAO/RCED-86-219, Sept. 26, 1986).

We reviewed position papers from the Natural Resources Defense Council regarding NAFTA to gain the perspective of an environmental group about the agreement and about pesticides on Mexican produce.

To learn about DDT use, we obtained information from FDA on the violation rate of DDT in Mexican and domestic produce and asked FDA and Mexico about the conditions under which DDT is used in Mexico. We used FDA data obtained from FDA's Division of Contaminants Chemistry and interviewed FDA and Mexican officials.

Our report compares different procedures and systems in the United States and Mexico and also analyzes tolerance differences in the two countries. However, we did not evaluate the implementation or effectiveness of the programs in either country.

Our work was performed in accordance with generally accepted government auditing standards from August 1991 to April 1992. We discussed the information presented in this report with EPA, FDA, USDA, and Mexican Embassy officials, who generally agreed with the information presented. Where appropriate, we incorporated their comments. However, as requested, we did not obtain written agency comments on this report.

Pesticide Registration and Tolerance-Setting Requirements Are Similar

The United States and Mexico have similar requirements for regulating pesticides. These procedures, directed by EPA in the United States and CICOPLAFEST in Mexico, entail the registration of pesticides and the establishment of tolerances. Both EPA and CICOPLAFEST register pesticides and assess tolerances by reviewing pesticide registration applications and data. However, EPA does not rely on the results of data reviews generated by other nations in its review of a registration application, while CICOPLAFEST uses such information, especially data generated by the United States, to assist it in its review process.

EPA Is Responsible for Registering Pesticides and Establishing Tolerances

Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended (7 U.S.C. 136 et seq.), EPA is responsible for registering pesticides using risk-benefit balancing to ensure that pesticide use will not result in unreasonable adverse effects on health or the environment. EPA registers a pesticide only if it determines that it will not cause any "unreasonable risk to humans or the environment, taking into account the economic, social, and environmental costs and benefits of the use of [the] pesticide." (FIFRA section 3(c)(5) and section 2(bb).) Basically, registrations are licenses for specific pesticide uses that state the terms, conditions, and cautions of these uses. In other words, a pesticide registered for use only on tomatoes cannot be used on strawberries, unless another registration is obtained to use the pesticide on strawberries.

To register a pesticide, EPA requires the manufacturer to provide health and environmental effects data,[1] product labeling information, a confidential statement of the chemical formula of the pesticide, and child-resistant packaging (if applicable) to EPA's Office of Pesticide Programs, Registration Division. It may take the applicant a few months to several years to gather the necessary data because of the time involved in completing the research required to obtain a registration. The Registration Division decides to approve or deny the registration after reviewing a complete application. This process can take an average of 2 years if all the necessary data have been provided, but much longer if the data are incomplete and additional data are needed.

Separate legislation guides the setting of tolerances for those pesticides registered under FIFRA. The Federal Food, Drug, and Cosmetic Act (FFDCA) requires EPA to establish tolerances—the maximum limits of pesticide residues allowed in or on raw agricultural commodities, processed foods,

[1]These data include acute toxicology data, residue data, environmental fate data, worker exposure data, product chemistry, oncogenicity data, potential birth defects data, efficacy data, and environmental effects data.

or animal feed. Establishing tolerances is a prerequisite to granting registrations for food-use pesticides used in the United States.

In order to establish a tolerance, EPA must determine whether tolerance levels proposed by pesticide registrants will present a health risk to the consumer. Registrants are required to submit toxicology and residue data in their tolerance petitions (applications) to assess possible health and environmental risks, to identify the nature and amount of residue that could occur with proper pesticide use, and to present analytical methods that FDA can use to test the food for residues of the pesticide. EPA scientists (reviewers) use these data to assess the possible health risks of a pesticide's use on food and to determine whether proposed tolerance levels would protect the public health. FDA enforces the EPA tolerances for both domestic and imported produce. (See ch. 4.)

EPA does not accept tolerances from any other country or standards from the Codex Alimentarius Commission[2] (Codex). According to EPA officials, EPA conducts an independent review because it must be able to assure the U.S. public that EPA health and safety standards are the basis for EPA's decision. Thus, EPA will establish a tolerance for a commodity (food) only on the basis of its review of the required safety data contained in the tolerance petition. While tolerances are incorporated into the registration if the pesticide will be used in the United States on food, in some cases tolerances are established without a registration. Such tolerances, referred to by EPA as "import" tolerances, apply only to imported food. These tolerances acknowledge other countries' needs for some pesticides (to control a pest that is not a problem in the United States or for use on a crop that is not grown domestically) that are not registered in the United States. Import tolerances require essentially the same safety data as U.S. tolerances—residue chemistry data and toxicological data— as well as the growing conditions of the country to assess the potential dietary risks posed by the pesticide. However, import tolerances do not need a U.S. registration because the review of the tolerance specifically addresses the pesticide's use on food and the residues it could leave, not applicator risk or the ecological or environmental effects of the use of the pesticide because the pesticide will not be used in the United States.

[2]In 1962, the Codex Alimentarius Commission (Codex) was created under the auspices of the United Nations to establish international standards, codes of practice, and guidelines for different foods and for food quality and safety concerns, including pesticide uses. Codex standards are voluntary and only enforceable if adopted and used as national regulations. Pesticide tolerances are expressed by Codex as a maximum residue limit and are similar in meaning to EPA's definition of a tolerance.

CICOPLAFEST Registers Pesticides and Establishes Tolerances in Mexico

Pesticide registration in Mexico is required under the 1974 Law on Plant and Animal Health of the United Mexican States, chapter 5, articles 41-50. Implementation of the law is carried out by CICOPLAFEST, which is Mexico's single authority for coordinating and making all scientific and regulatory decisions on pesticides, fertilizers, and toxic substances. Composed of high-level officials from the Ministries of Health, Agriculture and Water Resources, Commerce and Industrial Development, and Urban Development and Ecology, CICOPLAFEST reviews data and makes decisions on pesticide registration applications and tolerances.

To obtain a pesticide registration, CICOPLAFEST requires the same types of health and environmental studies as EPA—toxicological data, efficacy data, and long-term environmental effects studies. Like EPA, CICOPLAFEST also requires information such as chemical formulation data, use and application information, and first aid information. If the application is for a pesticide that already is registered by EPA, CICOPLAFEST generally accepts the application with minimum review.

While CICOPLAFEST is not required to readily accept EPA-registered pesticides, CICOPLAFEST officials stated that EPA's requirements and pesticide regulations are more stringent than Codex and for this reason they more readily accept EPA reviews. Other pesticides that are registered in other foreign countries or have Codex standards (tolerances) also receive shorter reviews than pesticide applications that present new data. CICOPLAFEST officials believe these countries' regulating agencies, like EPA, have established a reputation of competence.

If CICOPLAFEST determines that the foreign data do not account for Mexican weather conditions or climate, then it asks for additional data that take these factors into consideration. CICOPLAFEST will decide on registration after receiving this information. Approval of a pesticide registration requires signatures from three of the four ministries represented in the Commission. Reviewing registrants' applications may take anywhere from 1 month to 1 year, depending on the time it takes for research to be finished. After the review of the application is complete, CICOPLAFEST officials said they can make a decision on the application in as few as 10 days.

Both public and private sector officials in Mexico told us that CICOPLAFEST plays a central role in the government's regulation of pesticides. CICOPLAFEST has facilitated the registration process by removing the levels of bureaucracy that previously existed and allowing for direct access to

the relevant decisionmakers. Before CICOPLAFEST, an applicant for pesticide registrations had to visit each ministry to process the necessary paperwork for the registration. Now the registrant has to go only to CICOPLAFEST. In this respect, CICOPLAFEST is similar to EPA's Registration Division because pesticide registration applications are directed to one body in the government.

To set tolerances, Mexican officials told us that limited resources generally make it necessary for them to use existing scientific information from countries that have more resources devoted to scientific endeavors than Mexico. As a result, CICOPLAFEST generally accepts EPA tolerances or Codex standards[3] if the data are provided in the registration application. These data are reviewed by CICOPLAFEST's residue chemists from the Ministry of Health, who make sure the information is complete and the studies scientifically sound. If the residue chemists determine that the data are scientifically sound and that they account for Mexican climatic conditions, CICOPLAFEST will accept the tolerance(s) and grant a registration for the pesticide. However, if the residue chemist determines that these data do not take into account climatic conditions, the residue chemists will ask the registrant to provide additional data that factor in these conditions. After this information has been provided, the residue chemist determines the tolerance on the basis of the complete data package.

Conclusions

The registration and tolerance-setting requirements are similar in both countries. Differences exist, however, in the sources of information that Mexico uses in the registration and tolerance-setting procedures. While Mexico generally will accept data that has been reviewed by EPA, Codex, or other countries, the United States will not accept any data reviews from other countries; instead, all data are independently reviewed by EPA.

[3]EPA tolerances and Codex standards differ in their treatment of technical matters, such as the (1) definition of the components of a pesticide, (2) types of pesticides registered, and (3) interpretation of pesticide data in data packages. While the United States has tolerances for almost twice as many pesticides as Codex, GAO reported that almost two-thirds of U.S. and Codex pesticide standards cannot be compared because of the absence of U.S. tolerances for corresponding Codex standards or differences in the way pesticide residues are defined. Of the one-third that can be compared, less than half are numerically the same. See International Food Safety: Comparison of U.S. and Codex Pesticide Standards (GAO/PEMD-91-22, Aug. 22, 1991).

U.S. and Mexican Officials Are Working to Resolve Differences in Pesticide Tolerances

According to U.S. officials, a working group of U.S. and Mexican officials was established in May 1991 and is discussing options for resolving differences in tolerances between the two countries. While acknowledging that the task will be difficult and time-consuming, the group has broadly set priorities for the pesticide differences it will focus on and expects to resolve identified differences to the extent possible by May 1994. However, the group has not considered certain other tolerance differences that currently exist, nor has it developed a long-term plan for preventing future differences in tolerances for imported produce. This lack of a long-term plan will most directly affect the resolution of differences between the United States and Mexico and could also affect any similar discussions with other countries in the future.

Altogether, 487 pesticides have tolerances in the United States, in Mexico, or in both countries. According to FDA officials, when the tolerances do not have exact pesticide-commodity matches for commodities imported into the United States, the potential for FDA to find violations at the border increases. Thus, it is in the interest of both the United States and Mexico to work together to minimize the number of differences. Difficulties in resolving these differences depend, in part, on whether the pesticides already have some U.S. tolerances and the amount of additional data required to establish further tolerances.

Specifically, there are three categories of pesticide tolerance differences between the United States and Mexico: (1) pesticides that have tolerances in both countries but which have Mexican tolerances for some produce without comparable U.S. tolerances (58); (2) pesticides that have tolerances in Mexico, but not in the United States (17); and (3) pesticides that have tolerances in both countries for the same commodities but the tolerance are set at different levels. The working group plans to address the first two categories, but not the third.

U.S. and Mexican Officials Have Formed an Informal Working Group

According to an official involved, U.S. and Mexican officials convened an informal working group in May 1991 to (1) analyze and resolve to the extent possible differences in pesticide residue standards between the two countries and (2) discuss ways to educate Mexican growers on U.S. import regulations. (The educational efforts, as part of the ongoing communication between the two countries, are discussed in ch. 4.) The United States is represented by officials from FDA, EPA, and USDA. Mexico is represented by officials from CICOPLAFEST, primarily from the Ministry of Agriculture and Water Resources. Thus far, the group has met twice and

has identified tolerance differences and broadly set priorities for which categories of differences it will address first. According to officials from the working group, the group expects to complete its work by May 1994.

While the timing of the working group's discussions coincides with the NAFTA negotiations described in chapter 1, group officials stress that their work is not related to the free trade agreement. They formed the group because of the increasing amounts of Mexican produce coming across the border and related concerns about the violation rates of that produce. Group officials emphasize that their work would have occurred whether or not a free trade agreement was being negotiated. However, the prospect of such an agreement being signed and the increased imports that it could bring elevate the importance of the working group's discussions.

Several Factors Account for Tolerance Differences

According to both U.S. and Mexican officials, there are three primary reasons for differences in tolerances between the two countries. First, climatic differences: Mexico has warmer temperatures, different soil compositions, and different pests and may therefore have different pesticide needs and growing patterns than the United States. Second, each country has different crop productions and therefore different pesticide needs. For example, Mexican farmers grow a higher volume and a wider variety of peppers (e.g., serrano, jalapeño, and chili) than U.S. farmers do. This diversity could account for some tolerance differences. Third, while CICOPLAFEST frequently uses EPA reviews of data for setting tolerances, it may also use reviews from Codex or other developed countries.

A Plan to Minimize Tolerance Differences

According to an official from the working group, the group has determined that it will focus its work on two categories of differences. First, it will analyze which pesticides have tolerances established in both countries but have Mexican tolerances for some commodities that do not have U.S. tolerances. The group believes these differences will be fairly easy to resolve because EPA has already established some tolerances and some data for these pesticides have already been reviewed. However, if there are risk concerns or existing U.S. tolerances already approach or exceed the amount that EPA considers safe in the average diet, EPA may not be able to grant additional tolerances. Second, the group will analyze pesticides that have Mexican but no U.S. tolerances. Reconciling the differences for these pesticides will be more difficult, according to working group officials, because U.S. officials know less about these pesticides. The group has decided not to address a third category of pesticides—that is,

those pesticides that have tolerances for the same commodities in both countries, but at different tolerance levels. The group is not addressing these differences because few violations are cited at the border for residues exceeding tolerances. More frequently, violations are cited for residues that fall into the first two categories, i.e., where there have been no tolerances set. However, working group officials believe that the differences in this third group of pesticides would be the easiest to resolve because both countries already have tolerances for the given commodities.

To resolve differences, officials are considering different options, including (1) identifying other means of pest control or alternative pesticides that meet Mexico's needs and already have EPA tolerances; (2) extending existing commodity-specific EPA tolerances to cover whole crop groupings, e.g., for pesticides that have EPA tolerances for oranges, lemons, and grapefruits but not for limes, it may be possible to set a citrus fruit group tolerance to cover all citrus fruits; (3) establishing EPA import tolerances for certain pesticides that are necessary in Mexico and for which no substitute pesticides can be identified that already have tolerances in the United States; and (4) rearranging Mexican trade patterns to ensure that agricultural commodities with residues of pesticides that have no EPA tolerances are not exported to the United States.

Because of the differences in the growing conditions of the two countries, some differences in pesticide-commodity combination needs between the two countries will always remain, according to a representative of the U.S.-Mexican working group. It should also be noted that the United States actually has many more pesticides registered and tolerances established than does Mexico. However, these differences have not been the focus of discussions because Mexico does not currently test for residues on produce it imports.

According to a working group official, the group has also emphasized finding ways to educate Mexican growers on proper pesticide usage. The official explained that the group launched these educational efforts because many violative residues detected by FDA at the border violate not only U.S. but Mexican tolerances. For example, a residue of a certain pesticide could be found on cabbage, although neither the United States or Mexico has a tolerance for that pesticide on cabbage. When such a violative residue is detected, its presence indicates that the violation resulted from a misapplication of the pesticide, whether intentional or accidental. According to an official from the working group, even if exact pesticide-commodity tolerance matches existed between the two

countries, the same number of violations might occur because of misapplication by growers who were not trained and/or educated in proper pesticide practices or who might deliberately misuse pesticides.

Although many violations occur because of misapplications, the resolution of tolerance differences is still critically important. The American public has long perceived that a wide gap exists in the pesticide standards (tolerances) between the two countries. This first joint effort to analyze and resolve these differences will clarify how big the gap is and show what reductions can be made in these differences. This effort will also enable FDA to better interpret violations that occur and to focus its educational efforts on correcting the cause of the violations.

A Long-Term Plan Has Not Been Developed

Current discussions are not focusing on all regulatory activity that will eventually need to be discussed. According to an official from the working group, the group has not developed a long-term strategy for dealing with tolerances that will be established or revoked in each country in the future. The universe of pesticides is always changing, and without a framework in place to cope with those changes, new tolerance differences between the two countries will continue to develop. Moreover, while the absence of such a plan directly affects the ongoing U.S.-Mexican discussions, it could also affect similar discussions with other countries in the future.

Fifty-Eight Pesticides That Have Tolerances in Both Countries Have Some Mexican Tolerances Without Comparable U.S. Tolerances

The largest group of tolerance differences between the two countries involves those pesticides that have both U.S. and Mexican tolerances as well as tolerances for some fruits and vegetables in Mexico that the United States does not have: 58 pesticides fall into this category. The pesticide acephate, for example, has 41 U.S. tolerances and 12 Mexican tolerances. However, 2 of those 12 are for broccoli and cabbage, which do not have acephate tolerances in the United States. While residues of acephate would be legal if found on celery, for example, similar residues would be in violation if detected by FDA on broccoli.

The U.S.-Mexican working group has focused on this category of 58 pesticides, according to a group official, because it is more optimistic that it will be able to work through the differences. In addition, Mexico is currently evaluating which of these pesticides appear most critical for Mexican agriculture, which will help the working group set priorities within the category. Because the basic toxicity data have been generated

and reviewed and EPA has already established some tolerances for this group of 58 pesticides, EPA is more likely to be able to set new tolerances for additional commodities or to extend certain tolerances to cover crop groupings if necessary additional data are submitted. According to FDA officials, the largest number of violations occur in this group of pesticides. Appendix I lists the 58 pesticides and the commodities that have Mexican tolerances without comparable U.S. tolerances.

Seventeen Pesticides Have Mexican but Not U.S. Tolerances

Mexico also has tolerances for 17 pesticides that have no U.S. tolerances, according to USDA data. Of these 17, 6 have tolerances in Mexico for types of produce that are imported to the United States; the remaining 11 have Mexican tolerances for commodities other than produce or for produce not imported into the United States and therefore have no significant impact on U.S.-Mexican trade at this time. U.S. and Mexican officials believe that working through the differences for the six pesticides that concern imported produce will be difficult and will require much further analysis because the basic data have not been reviewed for them by EPA. Appendix II presents information on the group of 17.

Six Pesticides Have Mexican Tolerances for Produce Imported Into the United States

Six of the 17 pesticides that have no U.S. tolerances have Mexican tolerances for produce that is imported into the United States from Mexico. Of the six pesticides, five have never had a U.S. food-use registration or tolerance. The sixth pesticide had a U.S. registration (and one tolerance), which was voluntarily cancelled by the manufacturer.

The five pesticides that have never had EPA registrations and tolerances for food commodities are azocyclotin, bitertanol, carbendazim, omethoate, and propamocarb hydrochloride. These pesticides have tolerances in Mexico for produce that the United States generally imports in large quantities from Mexico, such as avocados, beans, melons, and strawberries. According to officials from the U.S.-Mexican working group, because these pesticides have never been registered in the United States and therefore have not had data packages collected and reviewed, it will take much further analysis, and in some cases may not be possible, to obtain an EPA registration or tolerance. Two of these pesticides (carbendazim and omethoate), however, are metabolites[1] of pesticides that have current EPA registrations and tolerances. For carbendazim and

[1]A compound derived, in the case of a pesticide, by chemical, biological, or physical action upon the pesticide within a living organism. The metabolite may be more, equally, or less toxic than the original compound. Metabolites can also be produced by the action of environmental factors such as temperature or sunlight.

omethoate, EPA has reviewed the data and granted registrations and tolerances for pesticides with similar chemical formulas. Because EPA is already familiar with data for metabolites of these pesticides, it may be easier for EPA to make decisions regarding these pesticides. (Azocyclotin is a metabolite of cyhexatin, which has EPA tolerances. However, according to an EPA official, cyhexatin's registration was cancelled in 1987, and therefore its tolerances will eventually be revoked.)

In order to make informed decisions on these pesticides, U.S. and Mexican officials believe they need to first determine if Mexican farmers need them. The officials acknowledge that obtaining an EPA registration and tolerance for these pesticides could take years. They also noted, however, that most violations cited at the border are not for pesticides falling into this category but for the pesticides in the group of 58 that have at least some tolerances in both countries, but not for the sampled commodity. Appendix III lists these five pesticides, the commodities that have Mexican tolerances, and their current EPA status.

The sixth pesticide, pirimicarb, was registered with EPA at one time, but the manufacturer voluntarily cancelled its registration in 1981.[2] EPA officials could not identify the concern about the pesticide that prompted the manufacturer to cancel it. EPA had set one tolerance for pirimicarb, on potatoes, which was subsequently revoked in 1988. As of June 1991, Mexico had 13 tolerances for pirimicarb: on apples, two types of beans, citrus fruit, two types of onions, peaches, pecans, three types of peppers, potatoes, and wheat. USDA data show that the United States imports large quantities of beans, citrus fruit, onions, and peppers from Mexico.

Pirimicarb may represent the most difficult situation in their work to resolve tolerance differences, according to officials from the U.S.-Mexican working group. Because this pesticide's registration has been cancelled in the United States, it is unlikely that EPA would reregister it or establish any tolerances for it.

According to an EPA official from the tolerance revocation division, all tolerances of pesticides that have been cancelled will eventually be revoked, even if the pesticide was cancelled for nondietary reasons. However, the time it takes for a cancelled pesticide's tolerances to be revoked depends on the reasons for the cancellation. If a pesticide is cancelled because of significant dietary concerns (found to pose

[2]A registrant may request that its registration be cancelled at any time. The request does not have to include the registrant's reason for the cancellation.

unreasonable risk if consumed on foods), then EPA will try to revoke the pesticide's tolerances as soon as possible. However, EPA officials stated that if a pesticide is cancelled for other reasons (e.g., for economic reasons—the manufacturer does not want to pay to continue its registration or comply with new data requirements), then removing a pesticide's tolerances is considered a lower priority. In many cases, when a pesticide is cancelled, the manufacturer is given a year to sell (and then growers are allowed from 6 months to 1 year to use) their existing stocks of that pesticide. EPA officials estimated that the average time taken to revoke a cancelled pesticide's tolerances is 2 years after its registration has been cancelled. After EPA revokes a pesticide's tolerances, the residues of it, if detected, are a violation. In general, according to EPA, tolerance revocations reflect a "pipeline" period during which legally treated crops pass through the channels of commerce, so that legal use of a pesticide will not result in violative residues.[3]

Eleven Pesticides Do Not Significantly Affect U.S.-Mexican Trade

Eleven other pesticides also have Mexican tolerances but no U.S. tolerances, according to USDA data. However, the differences in these pesticides are not as critical because, for various reasons, they do not have a significant impact on Mexican imports to the United States at this time, according to a working group official.

Of these 11 pesticides, the following 8 have tolerances in Mexico for commodities other than produce: clethodim, copper 8-quinolinalate, edifenphos, haloxyfop-methyl, isazophos, phoxim, tebuconazole, and triflumuron. Most of these pesticides have Mexican tolerances for grain. They do not have a large impact on U.S.-Mexican trade because grain is only a very small portion of Mexican exports to the United States.

Three other pesticides—betacyfluthrin, triazophos, and vamidothion—have Mexican tolerances for produce that the United States does not import from Mexico, such as apples and potatoes. Consequently, the use of these pesticides on these commodities in Mexico is not now an issue for Mexican agricultural exports to the United States.

Conclusions

There are a significant number of pesticides with Mexican tolerances for food commodities that do not have U.S. tolerances. Most of these

[3]Currently, four pesticides with Mexican tolerances—captafol, chlorobenzilate, EPN, and monocrotophos—have had their U.S. registrations cancelled for toxicological reasons but have not had their tolerances revoked. Because their tolerances still exist, residues of them found on produce are not illegal if found within the tolerance levels, according to EPA officials.

pesticides have U.S. tolerances for other foods; that is, the registrant collected, and EPA reviewed, all of the basic data when the other tolerances were established. Consequently, it will probably be feasible to obtain a U.S. tolerance for the Mexican commodity or to find alternative pesticides that already have EPA tolerances, although it will take further analysis to work through the differences.

For those pesticides having Mexican tolerances but no U.S. tolerances for any food commodities, reconciling the differences between the two countries may be more difficult. U.S. and Mexican officials will first have to determine the reason for the need and then explore options, such as finding alternative pesticides or obtaining import tolerances, for resolving differences.

At present, the working group has no plans to discuss the other category of difference—those tolerances that exist in both countries, but at different levels for the same commodity. Moreover, the working group has no long-term plan for addressing or preventing tolerance differences between the United States and Mexico in the future. Because new pesticides and/or tolerances are always being developed or cancelled, new differences will arise and may not be resolved. Such a framework for addressing or preventing new differences would help the resolution of differences with Mexico. Additionally, a long-term plan could provide a model for future pesticide tolerance and trade discussions with other countries.

Recommendation

To help ensure that pesticide tolerance differences between the United States and Mexico are kept at a reasonable minimum, we recommend that the Administrator of EPA and the Commissioner of FDA work with Mexican officials to develop a strategy for resolving, where possible, all types of pesticide differences. This strategy should also provide a long-term plan to deal with the continually changing field of pesticides.

The United States and Mexico Are Working to Ensure the Safety of U.S. Imports

The United States and Mexico differ in their monitoring for safe levels of pesticide residues on Mexican fruits and vegetables entering the United States. In the United States, FDA has both a sampling program to monitor imports and a special program to test Mexican produce for pesticide residues.

In contrast, the Mexican government now has limited abilities to monitor pesticide residues and to enforce its pesticide laws, but, according to Mexican officials, it wants to develop these capabilities. As part of this effort, the government is working with private industry to develop a national laboratory system for testing food for pesticide residues. Currently, however, most monitoring of pesticide residues remains with private industry, through the activities of the National Confederation of Fruit and Vegetable Producers, statewide organizations, and Mexican and multinational companies.

In addition to monitoring, there are other efforts in place between the two countries to help ensure the safety of Mexican produce. FDA has signed a Memorandum of Understanding with Mexico that has helped establish regular communication between the two countries. These exchanges are intended to enhance Mexican understanding of U.S. import regulations and to offer educational and technical assistance. The U.S.-Mexican Working Group (described in ch. 3) is also discussing projects for this assistance. In addition, an agricultural technique, integrated pest management (IPM), is used by some Mexican growers. IPM may help reduce pesticide application through the use and manipulation of insects.

The United States Has a Program to Monitor Pesticide Residues on Produce

FDA is the federal agency that plays the major role in ensuring the safety of produce consumed in the United States, including the large quantities of imported Mexican produce. Through its sampling program, FDA has found that Mexican produce has a higher violation rate, on average, than domestic produce. The high volume of imports prompted FDA to devote more of its resources to testing Mexican produce than produce from other countries. In addition, there has been public concern that Mexican farmers have been treating their produce with the pesticide DDT, which was cancelled by EPA because of potential adverse health and environmental effects. However, FDA data show that DDT violations in both Mexican and domestic produce are infrequent and, according to FDA officials, do not present a public health concern.

FDA Has a Monitoring Program for Mexican Produce

FDA developed a special focus program in 1979 to monitor and enforce pesticide residues on Mexican produce. FDA began this program in response to the increasing volume of imported produce from Mexico and growing concerns about its safety. The program's mission, according to FDA's Compliance Program Guidance Manual, is to

- sample and analyze fresh and processed imported Mexican produce for pesticide residues,
- initiate enforcement action for shipments found to contain illegal residues, and
- gather information on the incidence and levels of pesticide residues on imported Mexican produce.

As with all FDA monitoring of imported food, this special focus program includes sample testing and pesticide residue detection. However, because of the high volume of Mexican produce coming into the United States, FDA has concentrated a greater percentage of its resources on testing fresh Mexican produce rather than other nations' fresh produce.[1]

FDA's Procedures for Sampling Mexican Produce

FDA collects samples of imported Mexican food at all U.S. border checkpoints. FDA uses a sampling plan that is based on prior testing history, experience and knowledge of Mexican pesticide use, and information on Mexican agricultural practices. These factors dictate the type of commodity to be sampled and the relative frequency of the sampling. Depending on where the sample is collected, the sample (surveillance sample[2] or compliance sample)[3] is taken to an FDA pesticide residue-testing laboratory in Los Angeles or Dallas. The sample is analyzed for various pesticide residues and found in violation if the residue (1) has no U.S. tolerances, (2) exceeds a food-use tolerance, or (3) lacks a food-use tolerance for that particular commodity. If the sampled food shipment is found to be in violation, it is to be either returned to Mexico or destroyed, and the grower/shipper from whose shipment the sample was taken may be placed on automatic detention.

[1]FDA also monitors and enforces pesticide residues on food imported from other countries and on domestic food.

[2]Surveillance samples are collected by FDA inspectors without any suspicion that illegal pesticide residues are present.

[3]Compliance samples are collected when FDA finds illegal residues in a surveillance sample or when other information leads inspectors to suspect the presence of illegal residues.

Essentially, automatic detention requires future shipments of the food from this grower/shipper to have a residue analysis certificate that states that the shipment was tested at a private pesticide residue-testing laboratory prior to crossing the border. FDA residue chemists review this analysis to determine if the private laboratory's scientific procedures are comparable to FDA scientific procedures. If there is any question about the methodology used, FDA will then sample this shipment and analyze the sample for violative residues. If the sample is not found in violation, the grower/shipper's shipments will no longer be subject to the certification requirement. However, if the samples are found in violation during this certification period, a grower/shipper is to remain on automatic detention until five samples taken during that growing season are free of violative residues.

Although we did not evaluate the effectiveness of this sampling program, our 1986 report[4] stated that FDA samples less than 1 percent of all imported food shipments, including those from Mexico. This small percentage cannot provide the public with absolute protection against exposure to illegal residues in produce. However, it can provide a gauge of the severity of the residue problem and can, therefore, guide FDA in its monitoring decisions of imports.

Mexico's Violation Rate Is Generally Higher Than the Domestic Rate

The Mexican violation rate is generally higher than the violation rate for domestic produce tested by FDA. Table 4.1 shows the Mexican and domestic violation rates for surveillance and compliance samples and these samples combined, by fiscal year.

[4]Pesticides: Better Sampling and Enforcement Needed on Imported Food (GAO/RCED-86-219, Sept. 26, 1986).

Table 4.1: Percentage of FDA Samples Found With Violations for Mexican and Domestic Produce, Fiscal Years 1979-91

	Mexican produce			Domestic produce		
Fiscal year	Total	Surv.	Comp.	Total	Surv.	Comp.
1979	**6.5**	4.4	18.1	**1.1**	0.8	12.9
1980	**8.2**	5.3	17.1	**2.2**	1.7	14.0
1981	**5.4**	3.3	22.2	**2.3**	1.7	13.8
1982	**6.6**	4.2	25.7	**2.8**	2.3	32.8
1983	**4.3**	2.7	18.2	**2.5**	1.8	19.7
1984	**5.0**	3.1	22.6	**1.8**	1.5	14.9
1985	**4.6**	2.7	20.3	**3.2**	2.1	17.0
1986	**3.7**	2.0	21.8	**4.8**	2.5	25.9
1987	**6.1**	3.8	18.7	**3.1**	1.9	14.8
1988	**5.8**	4.7	15.8	**2.1**	1.1	33.2
1989	**4.4**	3.5	21.4	**2.7**	1.2	39.7
1990	**6.6**	4.8	27.5	**1.9**	1.3	37.2
1991	**3.8**	2.5	16.5	**1.5**	1.0	29.2
Average percentage	**5.3**	3.6	20.0	**2.5**	1.6	22.3

Mexican violation rates are higher than the domestic violation rate in both the combined samples and surveillance samples. However, in compliance sampling, where FDA already has some suspicion that the shipment may contain residue violations, the domestic compliance rate is higher than the Mexican compliance rate.

According to FDA officials, the majority of Mexican violations occur in cases with pesticide residues that do not have a tolerance for the particular commodity on which the residue was found, rather than with residues of pesticides without any U.S. tolerances. For example, a sampled cabbage could be found in violation because it has a residue of a pesticide that does not have a tolerance for cabbage. However, this same pesticide might have a tolerance for lettuce. In addition, FDA officials point out that in many of these cases, residues violate Mexican tolerances as well as U.S. tolerances. For example, a residue may be found on broccoli, when neither the United States or Mexico has a tolerance for this pesticide on broccoli. According to FDA officials, those residues that violate tolerances in both countries are caused by misuse of the pesticide (intentional misuse, misreading the label, or accidental exposure, such as a grower's applying the pesticide to a field of lettuce that is adjacent to a field of cabbage), rather than differences in tolerances between the two countries.

FDA Has Found Few Samples Containing DDT Residues

As described above, the violation data collected by FDA can provide some gauge of the severity of a residue problem. The publicly perceived problem with the pesticide DDT is a case in point. There has been concern that Mexican growers have been treating produce with DDT, which has been cancelled by both EPA and the Mexican government because of potential adverse health and environmental effects. After cancelling DDT's registration, EPA revoked the tolerances for DDT, but FDA, in cooperation with EPA, established "action levels" to account for residues that could appear in a sample because of the persistence of DDT or its metabolites in the environment for many years. FDA records a violation for DDT when the residue exceeds these action levels. According to FDA data, very few DDT violations have appeared in sampled produce during the past 4 years. Tables 4.2 and 4.3 show the DDT violations for domestic and Mexican produce since 1988.

Table 4.2: Domestic Produce Samples With DDT Violations, Fiscal Years 1988-91

Fiscal years	Total samples[a]	Samples with DDT violations	Percentage of samples with DDT violations
1988	5,694	3	.05
1989	5,928	0	0
1990	6,818	0	0
1991	6,191	1	.02

Note: In 1988, FDA started collecting more specific data that gave the reason a particular pesticide was found to be in violation, i.e., the residue has no tolerance, exceeds tolerance, or is found on a commodity that does not have a tolerance for that pesticide.

[a]Routine testing procedures on each sample include testing for DDT residues.

Table 4.3: Mexican Produce Samples With DDT Violations, Fiscal Years 1988-91

Fiscal year	Total samples[a]	Samples with DDT violations	Percentage of samples with DDT violations
1988	4,161	13	.3
1989	4,088	5	.1
1990	3,505	2	.06
1991	2,539	1	.04

Note: In 1988, FDA started collecting more specific data that gave the reason a particular pesticide was found to be in violation, i.e., the residue has no tolerance, exceeds tolerance, or is found on a commodity that does not have a tolerance for that pesticide.

[a]Routine testing procedures on each sample include testing for DDT residues.

According to USDA data compiled from Mexico's Official Catalogue of Registered Chemicals, Mexico currently has no food-use tolerances for DDT. Mexican officials told us that DDT is allowed only for government use for public health campaigns, such as termite and mosquito control, and is applied indoors in enclosed, confined areas. Mexican government officials stated that DDT is not sold to the public and is generally used in southern Mexico to control the mosquitoes that cause malaria. Mexico is currently exploring alternatives to DDT.

While it is difficult to say that no grower is using DDT, Mexican officials believe that most DDT violations result from the carryover of DDT residues left from legal spraying. As evidenced in table 4.2, DDT detections also occur in domestic testing. According to FDA officials, the number of DDT violations is so small for both domestic and Mexican produce that it does not present a public health concern. However, FDA continues to routinely test for this pesticide.

Mexican Efforts to Monitor Pesticide Residues Are Still Evolving

Unlike the United States, the Mexican government currently does not have a sampling program that monitors produce exported to the United States. The Mexican government generally expects the private sector to monitor exported produce for pesticide residues. Mexico also does not have a program to monitor produce grown for domestic consumption.

The Mexican Government Has Limited Monitoring and Enforcement Capabilities

While the Mexican government has constructed the legal framework to address environmental problems, its ability to enforce its laws is limited. In March 1988, Mexico enacted its General Law for Ecological Equilibrium and Environment. The comprehensive law covers air, water, and soil pollution; contamination by hazardous materials and wastes; pesticides and toxic substances; the conservation of ecosystems; and the rational use of natural resources. According to Mexican officials, however, enforcement of Mexican laws is the major weakness in Mexico's environmental program. Mexican officials believe that a first step toward enforcement is making interested parties aware of the laws. To this end, CICOPLAFEST published a catalog on pesticide standards in 1990 and plans annual updates. The catalog, which lists the authorized pesticides and the commodities on which these pesticides are allowed, is the first codification of Mexico's pesticide standards. In addition, Mexican officials cited several government educational and enforcement efforts: (1) training and accrediting inspectors from the Ministry of Agriculture who conduct field inspections to monitor pesticide residues in produce and (2) working

in conjunction with universities to train growers in proper pesticide use. In another initiative, the Mexican government is working with private industry to develop a national laboratory system to monitor pesticide residues.

Mexico Is Developing a National Laboratory System

The Mexican government is currently working with private industry to set up a national laboratory system to test for pesticide residues and formulations. Mexican government officials told us that one government laboratory has been established; it serves as the model for testing pesticide residues and accredits private laboratories. There will be 11 private laboratories in the system; each will have one of two roles in pesticide analyses. Some, like the government laboratory, will focus on testing food to determine levels of pesticide residues. Others will be responsible for testing pesticide formulations to ensure that the pesticide conforms to registration requirements. Mexican government officials told us that five laboratories are currently functioning but information on samples tested and the results were not available. To train laboratory personnel, the Mexican government has received technical training assistance from FDA and has purchased laboratory equipment similar to FDA's equipment.

In addition, Mexican officials told us that there are several private laboratories operated by different growers' associations to test growers' produce prior to export. They cited two such laboratories in Culiacan and Celaya; exporters use the results of the residue tests to monitor pesticide residue levels on their crops during the growing season. Exporters may submit testing certificates from these laboratories to meet FDA's automatic detention requirements at the U.S.-Mexican border. FDA reviews these certificates to determine whether this pesticide residue analysis is comparable with FDA's methodology.

Private Efforts Are the Primary Enforcement Mechanism for Safe Pesticide Use

In our March 1990 report,[5] we stated that the Mexican government expects growers and exporters to take primary responsibility for knowing and meeting U.S. food safety and quality standards. We found this to be the case still. Private efforts to encourage proper pesticide use come at different levels, including the National Confederation of Fruit and Vegetable Producers, statewide organizations, and Mexican and multinational companies.

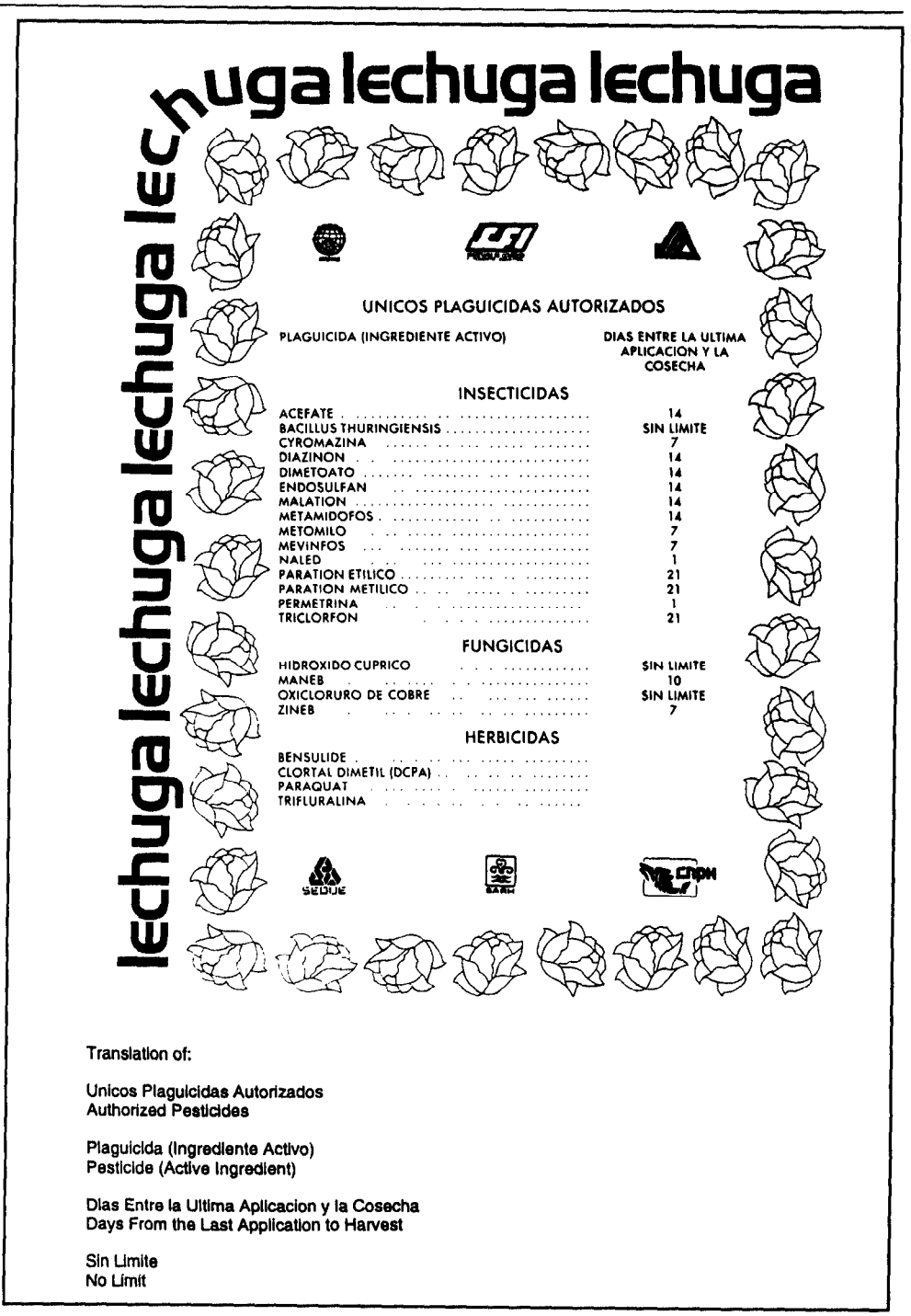
[5]Food Safety and Quality: Five Countries' Efforts to Meet U.S. Requirements on Imported Produce (GAO/RCED-90-55, Mar. 22, 1990).

According to Mexican growers, border violations provide the impetus for this private enforcement system. Such violations reflect poorly on all Mexican produce, not just on the produce found in violation. Consequently, misuse of pesticides by one grower could have repercussions throughout Mexico.

The Confederation Encourages Proper Pesticide Usage With a Variety of Methods

The Confederation, the largest association of fruit and vegetable producers in Mexico, is composed of numerous smaller agricultural associations throughout Mexico. The Confederation encourages proper pesticide use by, among other things, providing wall charts to statewide associations that detail all pesticides allowed by EPA on given commodities and the number of days required between application and harvest. (See fig. 4.1.)

Figure 4.1: Instructions for Pesticide Applications on Lettuce



Source: The Confederation of Agricultural Associations in the State of Sinaloa.

The Confederation also

- distributes information on changes to EPA regulations through monthly newsletters;
- encourages proper usage by testing produce at its pesticide residue laboratories; and
- operates a checkpoint at the border in Nogales, Sonora, where the largest amount of Mexican produce enters the United States.

The border office ensures that produce has the necessary paperwork for exporting a shipment, including the laboratory certificates required of those shipments on automatic detention.

Statewide Agricultural Associations Encourage Proper Pesticide Methods

Statewide agricultural associations work in conjunction with the Confederation at a local level and are thus able to work more closely with the growers. For example, the Confederation of Agricultural Associations in the state of Sinaloa, a statewide organization made up of 10 smaller agricultural associations, encourages proper pesticide use in a number of ways. Sinaloa Association officials distribute the Confederation posters on spraying to the farmers. They also hold monthly meetings with the Sinaloa State Agriculture Ministry to discuss pesticide uses and concerns. The meetings provide an opportunity for state officials to communicate any new regulations or policies to industry representatives, including growers, exporters, crop dusters, and pesticide manufacturers. In addition, the Sinaloa Association owns and operates a laboratory in Culiacan, Sinaloa, where produce is brought in by growers for testing. (This is one of the private laboratories the Mexican government cited.) Sinaloa Association officials told us that the state of Sinaloa has been exporting produce to the United States for 50 years and, consequently, has experience in production and monitoring. The Sinaloa Association is one of many established regional grower associations. Officials estimated that other such regional associations existed in 24 of the 32 Mexican states.

Management Practices of Large Growing Operations Help Meet U.S. Standards

According to the three operations we contacted in Mexico (two were Mexican-owned and operated; one was a multinational firm), management practices are in place to help ensure that their exported produce meets U.S. safety and quality standards. These practices include (1) carefully selecting growers who either work directly for the operation or are under contract; (2) providing the growers with their seedlings (which are centrally grown in the firms' greenhouses [see fig. 4.2]), potting soil, and

pesticides; (3) providing training by agronomists on the safe use and application of pesticides; (4) having firm agronomists survey the field to monitor the condition of the fields and the growth of plants (see fig. 4.3); (5) keeping records of what pesticide was sprayed, when, and how much. All three firms said that they spray only as needed, not only to control the amount of residue but also because it is expensive to spray pesticides. They test for pesticide residues if they believe it is necessary. In addition, they told us that if a violation was detected at the border, they could trace it to the individual farmer and the farmer would then lose his contract with the firm.

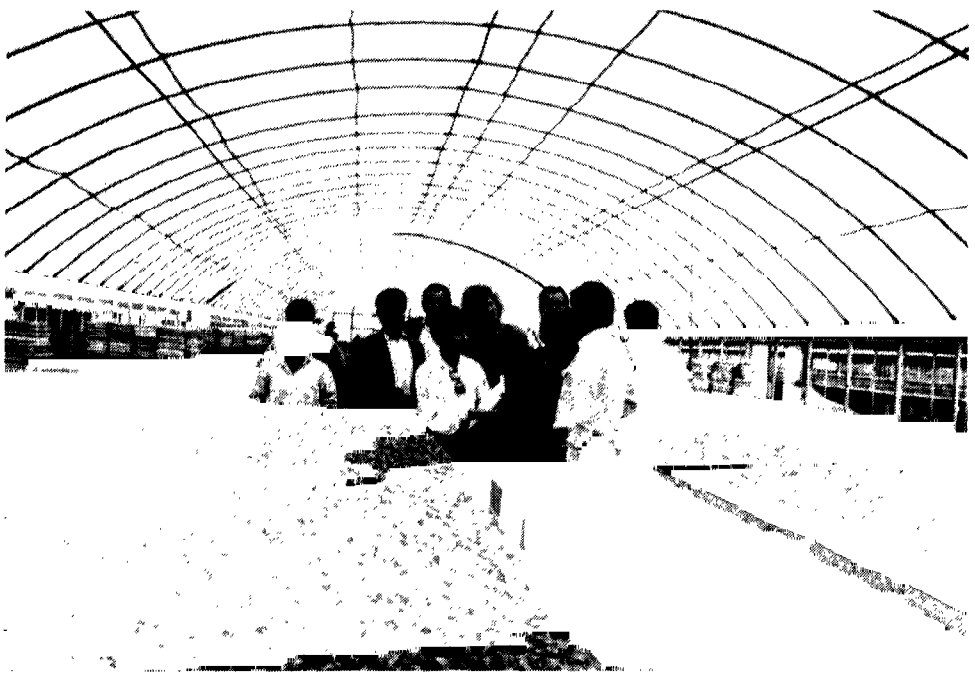
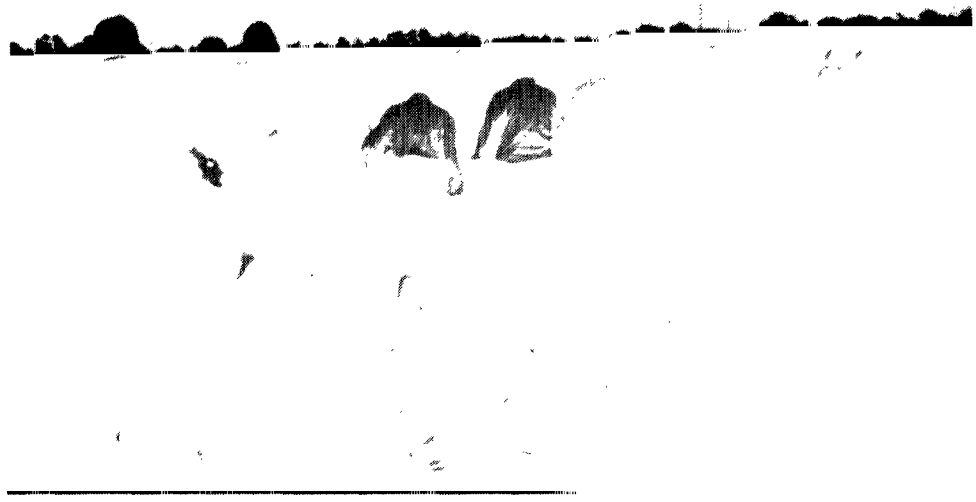


Figure 4.2: Export Crop Seedlings Being Grown in Centralized Greenhouse

Figure 4.3: Surveying Field of Export Crops With Firm Agronomists



Other Efforts Are Under Way to Ensure the Safety of Mexican Produce

In addition to monitoring, other efforts are ongoing to ensure the safety of Mexican produce. FDA and Mexico have a Memorandum of Understanding to share information and generate educational programs, including technical assistance and instructions on U.S. import regulations. Through these educational efforts, FDA and Mexico hope to reduce pesticide residue violations that, according to FDA's analysis of the violation data, are generally a result of pesticide misuse. Beyond these efforts, some Mexican growers are using IPM, which may help to reduce pesticide residues on produce.[6]

FDA and Mexico Communicate Regularly

FDA maintains regular communication with Mexico under a 1988 Memorandum of Understanding between FDA and the Mexican Ministry of Agriculture and Water Resources/Sanidad Vegetal. In 1990 the two countries attached an addendum to the memorandum to "provide greater health protection for both the American and the Mexican consumer" by eliminating the use of nonregistered pesticides, standardizing pesticide residue analyses, sharing scientific data, and improving communication. The agreement calls for both countries to interact and to

[6]According to some U.S. growers and a state representative from Florida, many U.S. growers are also using IPM.

- keep each other informed on issues dealing with federal regulations and legislation;
- communicate and cooperate when products are detained by either country because of noncompliance;
- develop mutual technical cooperation programs that resolve problems with products that are refused entry;
- assist with mutual technical training in areas such as analysis, sampling procedures, and import procedures;
- develop emergency procedures for products denied entry for health reasons;
- ensure that Mexican laboratories follow FDA guidelines for testing and giving certificates of analysis for products destined for the United States;
- share scientific information between scientific personnel;
- hold conferences between the liaison officers of both countries; and
- carry out the responsibilities set forth in the memorandum to the best of their abilities.

In this connection, we stated in our March 1990 report that FDA had provided Mexico with technical assistance to encourage the improvement of pesticide regulatory controls within Mexico and to help Mexico comply with U.S. import requirements.

As described in chapter 3, FDA and Mexican officials have held meetings to discuss tolerance issues as they relate to Mexican imports and to educate Mexican growers and officials about U.S. import regulations. These efforts fall under the broad auspices of the 1990 memorandum. The working group's educational programs with Mexico are aimed at curbing the misuse of pesticides. For example, the United States sponsored a recent training course for Mexican government officials and growers on reading pesticide labels. The purpose of the course was to emphasize to the participants (1) the importance of following the instructions of a pesticide label, (2) what happens when the instructions are not followed, and (3) the use of the pesticide only on the commodities listed on the label. According to working group officials, this effort is part of the group's goal of minimizing pesticide misuse. Moreover, as these educational efforts work to curb violations that generally result from misuse, the working group believes its efforts to resolve tolerance differences will also help minimize violations that result from tolerance differences in the two countries.

IPM May Help Minimize Pesticide Use

In addition, growers are also incorporating IPM into their pest control programs. IPM includes crop/pest management practices that may help

minimize pesticide use by promoting pest control through the use and manipulation of nonpesticidal control programs. These programs may result in lower residues on foods. IPM works by (1) identifying the pests on the crops; (2) defining what levels of pest damage are economically acceptable, both from the standpoint of production levels and the economics of marketing the crop (i.e., the levels of imperfection the consumer will accept); (3) evaluating the effectiveness of nonchemical control to combat the pests; and (4) using pesticides to supplement IPM control practices when necessary.

With IPM, some loss in crop yield and quality will occur. However, in the long term, pesticide use may be reduced, which may reduce the costs of production.

Growers in Guanajuato and Sinaloa told us they use IPM to control pests on their crops. These growers have found IPM to be economical and effective in controlling several pests, such as the fruit fly and beet army worm. One Mexican grower told us that for a growing season, IPM techniques cost about three-quarters as much as using pesticides alone. Another Mexican grower said that using IPM helps the grower minimize pesticide use and residues on produce. A multinational firm told us that about 70 percent of the controls they use are nonchemical in nature.

Conclusions

The U.S. program for monitoring pesticide residues on imported Mexican produce provides some gauge of the effectiveness of Mexican efforts to meet U.S. requirements. FDA's monitoring assures the public, to a limited extent, of the safety of imported and domestic produce. In contrast, the Mexican government recognizes that it lacks an active monitoring program and is beginning to take steps to strengthen its monitoring by working with the private sector; the national laboratory system is the first of such steps.

Beyond monitoring, other efforts involving communication between the two countries and alternative agricultural techniques may help to ensure the safety of Mexican produce. Specifically, educational and technical assistance efforts to curb pesticide misuse can also help Mexican export producers abide by U.S. requirements by providing a clearer understanding of those requirements. In addition, IPM may reduce pesticide residue levels, which would help Mexican produce meet U.S. requirements.

The 58 Pesticides With Mexican Tolerances for Some Fruits and Vegetables Without Comparable U.S. Tolerances

Pesticide	Produce that has tolerances in Mexico but not in the United States
Acephate	Beans[a] (EPA has tolerances for succulent and dry beans.), broccoli, cabbage, lettuce (EPA has a tolerance for lettuce head.)
Aldicarb	Citrus fruit[b] (EPA has tolerances for grapefruit, lemons, limes, and oranges.)
Ametryn	Citrus fruit (EPA has tolerances for grapefruit and oranges.)
Anilazine	Onions[c] (EPA has tolerances for bulb, dried, green onions, garlic, shallots.)
Avermectin	Celery
Azinphos methyl	Beans (EPA has tolerances for dried and snap beans and black-eyed peas.), guava
Bensulide	Onions (EPA has a tolerance for dried, bulb onions.)
Bentazon	Beans (EPA has tolerances for succulent, dried, vine, forage, and lima beans.), peas[d] (EPA has tolerances for dried, vine, forage, succulent peas.)
Captan	Chard, beans (EPA has tolerances for succulent and dried beans.), chick peas, onions (EPA has tolerances for dried, bulb, green onions, garlic, leeks, and shallots.), lentils, melons,[e] (EPA has tolerances for cantaloupes, honeydews, muskmelons, watermelons.), radishes
Carbofuran	Lemons
Carbophenothion	Melons (EPA has tolerances for cantaloupes and watermelons.)
Chlorothalonil	Beans, lima beans (EPA has tolerances for common, dried, snap beans.), onions (EPA has tolerances for bulb, dried, green onions.), garlic
Cyfluthrin	Apples
Cyromazine	Lettuce (EPA has a tolerance for lettuce head.)
Deltamethrin	Apples, beans, chick peas, potatoes, summer squash
Diazinon	Beans (EPA has tolerances for forage, hay, lima, snap beans.), peas (EPA has tolerances for peas [shells removed] and vine[s] peas.), pumpkins, squash[f] (EPA has tolerances for summer and winter squash.)
Dicofol	Beans (EPA has tolerances for dried, lima, snap beans.)
Dimethoate	Beans (EPA has tolerances for dried, lima, snap beans.), brussel sprouts, citrus fruit (EPA has tolerances for grapefruit, lemons, oranges, tangerines.), cucumbers, mandarines
Disulfoton	Beans (EPA has tolerances for dry, lima, snap, and vine beans.)
Endosulfan	Peas (EPA has a tolerance for succulent peas.)
Ethion	Pumpkins
Fenitrothion	Beans

(continued)

Pesticide	Produce that has tolerances in Mexico but not in the United States
Fenthion	Grapefruit, lemons, mandarins, oranges
Fenvalerate	Beans (EPA has tolerances for dried, snap beans.), melons (EPA has tolerances for cantaloupes, honeydews, and watermelons.)
Fluazifop-butyl	Avocados, grapefruit, lemons, limes, mandarins, onions (EPA has tolerances for bulb, dried onions.), oranges, peaches, peppers[g] (EPA has a tolerance for tabasco peppers.)
Folpet	Onions (EPA has tolerances for dried, bulb, green onions, garlic, leeks, shallots.), pears
Fomesafen Beans	
Fosetyl-AL	Avocados
Iprodione	Onions (EPA has tolerances for dried, bulb onions, garlic.)
Malathion	Citrus fruit (EPA has tolerances for grapefruit, lemons, limes, oranges, tangerines.)
Maneb	Beans (EPA has tolerances for common, dried, succulent beans.)
Metalaxyl	Beans, pears
Methidathion	Beans
Methomyl	Beans (EPA has tolerances for succulent, common, dried, forage beans.), citrus fruit (EPA has tolerances for grapefruit, lemons, tangerines.), onions (EPA has a tolerance for green onions.)
Methyl parathion	Chard, mandarins
Mevinphos	Onions, onions (bulb) (EPA has a tolerance for green onions.)
Naptalam	Melons (EPA has tolerances for cantaloupes, muskmelons, and watermelons.)
Oxamyl	Peppers[e] (EPA has tolerances for some peppers—bell, non-bell, and sweet.)
Oxydemeton-methyl	Beans (EPA has tolerances for common, lima [forage], snap beans.), lettuce (EPA has a tolerance for lettuce head.), onions (EPA has a tolerance for bulb, dried onions.)
Oxyfluorfen	Onions (EPA has tolerances for bulb, dried onions.)
Oxytetracycline	Apples, tomatoes
Oxythioquinox	Avocados, nectarines, peaches, plums, prunes
Paraquat	Beans (EPA has tolerances for dry, forage, hay, lima, snap, straw beans.), onions (EPA has tolerances for bulb, dried, green onions.), peas (EPA has tolerances for forage, hay, succulent, pigeon peas.)
PCNB	Chick peas
Pendimethalin	Onions, tomatoes
Permethrin	Peppers (EPA has tolerance for bell peppers.), pumpkins
Phosphamidon	Cabbage, cabbage (head)

(continued)

Pesticide	Produce that has tolerances in Mexico but not in the United States
Prometryn	Peas (EPA has tolerance for pigeon peas.)
Propargite	Beans (EPA has tolerances for succulent, common, dried beans.), citrus fruit (EPA has tolerances for grapefruit, lemons, oranges.)
Propham	Potatoes
Sethoxydim	Peaches, plums, prunes
TCMTB	Radishes
Tetradifon	Citrus fruit (EPA has tolerances for citrus citron, grapefruit, lemons, limes, oranges, tangerines.)
Thiabendazole	Squash (EPA has a tolerance for hubbard squash.)
Thiram	Onions (EPA has tolerances for bulb, dried onions.)
Trichlorfon	Beans (EPA has tolerances for common, dried, lima, snap, vine[s] beans.), chick peas, squash
Triforine	Melons (EPA has tolerances for cantaloupe and watermelon.), peppers (EPA has a tolerance for bell peppers.)
Zineb	Potatoes (EPA has an interim tolerance for potatoes—for seed piece treatment only.)

[a]Beans include green beans, lima beans, navy beans, red kidney beans, snap beans, cowpeas, and black-eyed peas.

[b]Citrus Fruits include grapefruit, lemons, limes, oranges, tangelos, tangerines, citrus citron, kumquats, and hybrids of these.

[c]Onions include dry bulb onions, green onions, garlic, leeks, shallots, and spring onions.

[d]Peas include pigeon peas, chick peas, garbanzo beans, lentils, dwarf peas, garden peas, green peas, English peas, field peas, and edible pod peas.

[e]Melons include cantaloupes, casabas, crenshaws, honeyballs, honeydew melons, muskmelons, Persian melons and hybrids of these, and watermelons and their hybrids.

[f]Squash includes pumpkin, summer, and winter squash.

[g]Peppers include all varieties of peppers, including pimentos, bell, hot, and sweet peppers.

The 17 Pesticides With Mexican but No U.S. Tolerances

Pesticide	The commodities that have Mexican tolerances
Azocyclotin	Apples, avocados, beans, peaches
Betacyfluthrin	Cottonseed, potatoes
Bitertanol	Beans, cottonseed
Carbendazim	Apples, avocados, bananas, beans, celery, citrus fruit, coffee beans, cucumbers, eggplant, garlic, grapefruit, grapes, lemons, lettuce, limes, mangos, melons, oranges, pears, pecans, peppers, pineapple (edible pulp), squash, strawberries, tomatoes, watermelon
Clethodim	Soybeans (EPA has a temporary tolerance for soybeans, which will expire on 1/31/94.)
Copper 8- Quinolinolate	Barley, oats, wheat (This pesticide has been exempted[a] from having a tolerance in Mexico for these commodities.)
Edifenphos	Husked rice, polished rice
Haloxyfop-methyl	Cottonseed
Isazophos	Corn, sorghum
Omethoate	Alfalfa, apples, beans, snap beans, dry beans, lima beans, cabbage, cabbage head, cauliflower, celery, chard, corn (grain), cottonseed, grapefruit, grapes, lemons, lentils, lettuce, lettuce head, leaf lettuce, melons, oranges, pears, peas, pecans, peppers, potatoes, safflower seed, sorghum (grain), soybeans, spinach, tomatoes, turnips, wheat
Phoxim	Corn, rice, sorghum
Pirimicarb	Apples, beans (shelled, common), citrus fruit, onions, bulb onions, peaches, pecans, chili peppers, sweet peppers, potatoes, wheat
Propamocarb hydrochloride	Melons, peppers, sweet peppers, strawberries, tomatoes
Tebuconazole	Barley
Triazophos	Corn, cottonseed, potatoes
Triflumuron	Cottonseed
Vamidothion	Apples

[a]A tolerance exemption is granted by EPA if it determines that a tolerance for a pesticide is not necessary to protect the public health.

The Five Pesticides With Mexican Tolerances for Produce That May Be Exported to the United States but Have Never Had U.S. Food-Use Tolerances

Pesticide	Number of Mexican tolerances	The commodities that have Mexican tolerances	Current EPA status
Azocyclotin	4	Apples, avocados, beans (common), peaches	Never registered by EPA. It breaks down into cyhexatin, which was voluntarily cancelled by manufacturer in 1987. However, some tolerances remain in place.
Bitertanol	3	Beans, common beans, cottonseed	Never registered by EPA. Has an application pending since 1982 for an import tolerance on bananas.
Carbendazim	26	Apples, avocados, bananas, beans, celery, citrus fruit, coffee beans, cucumbers, eggplant, garlic, grapefruit, grapes, lemons, lettuce (head), limes, mangos, melons, oranges, pears, pecans, peppers, pineapple (edible pulp), squash, strawberries, tomatoes, watermelon	Never registered by EPA. It is a metabolite of benomyl and thiophanate-methyl. In the mid-1970s, registrant petitioned to use the same data used for its metabolites to get carbendazim registered. EPA ruled against this and the manufacturer has not submitted any more data for this pesticide.
Omethoate	34	Alfalfa, apples, beans, snap beans, dry beans, lima beans, cabbage, cabbage head, cauliflower, celery, chard, corn (grain), cottonseed, grapefruit, grapes, lemons, lentils, lettuce, lettuce head, leaf lettuce, melons, oranges, pears, peas, pecans, peppers, potatoes, safflower seed, sorghum (grain), soybeans, spinach, tomatoes, turnips, wheat	Never registered by EPA. Omethoate is a metabolite of dimethoate. EPA currently has 70 tolerances for dimethoate but none for omethoate. There are no tolerances pending for omethoate.
Propamocarb hydrochloride	5	Melons, peppers, sweet peppers, tomatoes, strawberries	Currently is registered with EPA and has tolerances for turf and ornamental uses, i.e., lawns, golf courses, grass, sod farms. No tolerances pending for anything else.

Note: Information on current EPA status is based on EPA documents and discussions with EPA officials.

The 10 Pesticides That the Mexican Government Considers Critical for Mexican Agriculture

Of all the pesticides that have differences in tolerances, CICOPLAFEST officials developed a list of 10 pesticides that they consider especially critical for use in Mexican agriculture. For each of these pesticides, Mexico has some tolerances that the United States does not have. Many of these differences were also cited by USDA data.

In a December 1990 letter to EPA's Office of Pesticides and Toxic Substances, CICOPLAFEST described these 10 pesticides and the commodities on which they want to use them. CICOPLAFEST officials told us that they had received no response to their letter. However, we obtained a February 1991 response from EPA to CICOPLAFEST that expressed EPA's willingness to assist Mexico in understanding the scientific and regulatory basis for EPA's decisions on various pesticides; the response also provided the status of each of the pesticides that Mexico had inquired about.

Six of these pesticides—acephate, avermectin, bifenthrin, deltamethrin, fosetyl-al, and pendimethalin—are registered in the United States and have tolerances established for some food commodities. For four of those six, EPA has a tolerance or one pending for the commodities of interest to Mexican officials. Three other pesticides—carbendazim, omethoate, and pyrazophos—have never been registered in the United States. Mexico also listed one pesticide, captafol, that had its U.S. registration cancelled because of toxicological concerns.

We brought these two letters to the attention of the U.S.-Mexican working group so that it can address the Mexican need for these 10 pesticides. According to officials from the working group, it is not clear for most of the these pesticides what specific Mexican growing conditions or pest problems make these pesticide-commodity combinations necessary, and they are working to get this information. The officials acknowledge that both countries must discuss Mexico's pest control needs for these and other pesticides and the most appropriate way to address those needs. One official pointed out that while the 1990 list of 10 pesticides could serve as an indication of Mexican needs, the list will develop further as the working group discussions continue. Table IV.1 lists these pesticides, the commodities on which Mexico wants to use them, the commodities that currently have Mexican tolerances, and the current EPA status of these pesticides.

Table IV.1: Pesticides of Particular Interest to Mexican Agriculture

Pesticide and the commodities that Mexico wants to use it on	Commodities that have Mexican tolerances currently	Current EPA status
Acephate on cabbage	Beans, dry beans, succulent beans, broccoli, brussel sprouts, cabbage, cabbage head, cauliflower, celery, cotton, lettuce, peppers, soybeans	Currently has 41 EPA tolerances, including tolerances for broccoli and cauliflower but not cabbage. Methamidophos is a metabolite of acephate. It has 18 EPA tolerances, including one for cabbage.
Avermectin on tomatoes, strawberries, celery	Celery, tomatoes	Currently has 9 EPA tolerances, including an import tolerance for tomatoes. Also has 10 tolerances pending, two of which are for strawberries and celery.
Bifenthrin on strawberries	Cottonseed, wheat	Currently has 17 EPA tolerances for milk, meat products, cottonseed. Also has 11 tolerances pending, including one for strawberries.
Captafol on squash	Apples, citrus fruit, coffee, cucumbers, grapefruit, lemons, melons, onions, oranges, peaches, peanuts (meats), pineapples, potatoes, tangerines, tomatoes, watermelons	Voluntarily cancelled by its manufacturer in 1987 because of concerns about its toxicity. EPA tolerances for 27 commodities still remain but there was never one for squash. All EPA tolerances will eventually be revoked.
Carbendazim on squash, peppers, strawberries, tomatoes, cantaloupe, cucumbers, and pineapples	See appendix 3.	See appendix 3.
Deltamethrin on tomatoes	Alfalfa, apples, barley, beans, chick peas, corn, cottonseed, oats, pecans, potatoes, rice, sorghum, soybeans, squash, wheat	Currently has two tolerances, one of which is an import tolerance for tomatoes.

(continued)

Pesticide and the commodities that Mexico wants to use it on	Commodities that have Mexican tolerances currently	Current EPA status
Fosetyl-al on tomatoes	Avocados, grapefruit, lemons, oranges, pineapples	Has 10 EPA tolerances, including tolerances for caneberries,[a] citrus (including grapefruit, lemons, oranges), pineapples. Has regional tolerances for asparagus and ginseng root. There are additional applications pending for onions, strawberries, stonefruit,[b] hops, cucurbits,[c] avocados, pome fruits,[d] brassica crops, lettuce, celery, spinach, tomatoes.
Omethoate on peppers, cabbage, tomatoes, lettuce, cantaloupe	See appendix 3.	See appendix 3. Dimethoate has tolerances for the commodities that Mexico listed, except for cabbage.
Pendimethalin on garlic	Barley, corn (fresh and grain), cottonseed, garlic, onions, potatoes, rice, soybeans, tomatoes, wheat	Has regional tolerance for garlic in California, Nevada, and Oregon. Also has tolerances for corn, cottonseed, potatoes, rice, and soybeans.
Pyrazophos on squash	None	Has never been registered or had any tolerances set by EPA. No applications for any commodities are pending.

Note: The information on the current EPA status is based on EPA documents and discussions with EPA officials.

[a]Caneberries include blackberries, youngberries, loganberries, red and black raspberries, and varieties and/or hybrids of these.

[b]Stone fruits include apricots, cherries (sour and sweet), damsons, nectarines, pawpaws, peaches, plums, and prunes.

[c]Cucurbits include cantaloupes, casabas, crenshaws, cucumbers, honey balls, honeydew melon, melon hybrids, muskmelons, melons, persian melons, pumpkins, summer squash, watermelons and hybrids, and winter squash.

[d]Pome fruits include apples, crabapples, pears, and quinces.

Major Contributors to This Report

Resources, Community, and Economic Development Division, Washington, D.C.	Peter F. Guerrero, Associate Director, Environmental Protection Issues, (202) 512-6522 J. Kevin Donohue, Assistant Director Mary Alice A. Hayward, Staff Evaluator Kathleen M. Johnson, Staff Evaluator Carol Herrnstadt Shulman, Reports Analyst

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