

**Specific Review of the Program to Allow the
Importation of Mexican Hass Avocados**

Date: May 1, 2001

Specific Review of the Program to Allow the Importation of Mexican Hass Avocados

A. Summary

At the request of the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS) Administrator, a program review was initiated on part of the systems approach used to allow access of Mexican Hass avocados into the United States. This program review was stimulated by concerns presented to the APHIS Administrator by the California Avocado Commission in both a letter dated July 18, 2000 and at a subsequent visit to the Administrator by a representative of the California Avocado Commission. This program review included a site visit to the avocado growing areas near Uruapan in the State of Michoacan, Mexico from September 26, 2000 until September 28, 2000. Participants in the review included three representatives from USDA, APHIS, Plant Protection and Quarantine (PPQ) headquarters' staff in Riverdale, MD, representatives from USDA, APHIS, International Services (IS) in Mexico City and Guadalajara, representatives from the USDA, APHIS, IS program in Uruapan, a representative from the California Department of Food and Agriculture and a representative from the California Avocado Commission in conference with representatives from the Mexican National Plant Protection Organization, Direccion General de Sanidad Vegetal (DGSV), the State of Michoacan's plant health organization, Comite Estatal de Sanidad Vegetal (CESV), and a representative of the Mexican Avocado Growers association (APEAM). Also participating during the review, as a subject matter expert, was a researcher from the Instituto de Ecologia, A.C.'s Department of Entomology in Vera Cruz, Mexico whose expertise includes a published study on the Avocado Seed Moth, *Stenoma catenifer*.

The review's special emphasis was on the pest surveillance activities required within the systems approach and the programs compliance to these required surveillance activities in Mexico as outlined in Title 7 of the Code of Federal Regulations Part 319.56-2ff Administrative instructions governing movement of Hass avocados from Mexico to the Northeastern United States (7 CFR 319.56-2ff) and is specific to those activities. Because the harvest and shipping season is limited to the months of November, December, January and February, the review does not include any observations of pest surveillance activities performed at the packinghouses nor at the points of entry into the United States. The review also does not emphasize compliance to any packinghouse, harvest, shipping or labeling safeguard requirements except that observations were made on orchard sanitation. This report includes a compilation of the observations of the three USDA, APHIS, PPQ representatives from Riverdale, MD in consultation with APHIS, IS officials in Mexico.

This document assesses the adherence to specific surveillance activities incorporated as phytosanitary measures of the systems approach outlined in 7 CFR 319.56-2ff. 7 CFR 319.56-2ff is included as Appendix B.

APHIS considers the pest surveillance activities performed in Mexico that were reviewed during this site visit to be in compliance with the requirements of 7 CFR 319.56-2ff.

B. Review Sources

The primary sources for information for the review were:

- Observations made on the site visit to Michoacan, Mexico in September 2000 by Wayne D. Burnett, Joe Cavey and Jeff Grode, from Riverdale, Maryland, APHIS. The site visit included the review of pre-harvest pest surveillance activities, an interview with Dr. Luis Cervantes, a research entomologist from the Instituto de Ecologia, an interview with Dr. Leopoldo Adame Espinoza, the Mexican entomologist responsible for the identification of avocado arthropod pests, excepting Tephritid fruit flies, and consultations with various USDA, APHIS, IS officials and Mexican officials having direct participation in the program activities.
- The current approved work plan for the movement of Hass Avocados from Mexico to the United States of America.
- 7 CFR 319.56-2ff.
- A letter from the California Avocado Commission to the APHIS Administrator dated July 18, 2000.
- Pest surveillance results from the initiation of the program.
- Mexican Regulation NOM 66.
- Site visit report by Dr. Luis Cervantes.
- Site visit report by Jeff Hillard, California Department of Food and Agriculture(CDFA).

C. Detection and Monitoring Surveys

(1). Area and Production Site Surveys:

(a). Municipalities.

7 CFR 319.56-2ff requires that avocados must be grown in the Mexican State of Michoacan in orchards found in approved municipalities. And, for a municipality to be approved, it must meet the following pest surveillance requirements:

- (i) The municipality must be surveyed at least annually and found to be free from the large avocado seed weevil *Helipus lauri*, the avocado seed moth *Stenoma catenifer*, and the small avocado seed weevils *Conotrachelus aquacatae* and *C. perseae*. The survey must cover at least 300 hectares in the municipality and include randomly selected portions of each registered orchard and areas with wild or backyard avocado trees. The survey must be conducted during the growing season and completed prior to the harvest of the avocados.

All municipalities from which Mexican Hass avocados are exported to the US are in the State of Michoacan and are surveyed by Mexican inspectors each year. Survey results can be read in Appendix D. The pest surveillance methods used as outlined in the annual work plan found in Appendix C are adequate to detect the above listed pests. APHIS did an analysis of these pest surveillance methods which are included in Appendix F. In fact, the fruit cutting surveillance method used for the avocado seed moth, *Stenoma catenifer*, is “the best way to detect the moth” as is stated in Dr. Cervantes site visit report found in Appendix E. After review of the pest surveillance records the program was found to be in compliance with this requirement. Appendix a contains photographs of the pest surveillance activities.

- (ii) Trapping must be conducted in the municipality for Mediterranean fruit fly (Medfly) (*Ceratitidis capitata*) at the rate of 1 trap per 1 to 4 square miles.

The review team observed the proper servicing of a fruit fly detection trap. Review of the trapping records provided by DGSV revealed that that program is in compliance with this requirement.

(b). Orchards.

- (i.) 7 CFR 319.56-2ff requires that any orchard approved for export to the US must be registered with DGSV’s export program and then must be listed as an approved orchard or an approved grower in the annual work plan provided to APHIS by DGSV. To get registered in the export program requires participation in a multiple step pest inspection and approval process outlined in the Mexican regulation NOM-066. This approval process involves the participation of several governmental agencies. The registration process can take several years. An outline of the required steps which must be achieved are as follows:

- ◆ Growers petition to the Junta Local de Sanidad Vegetal (JLSV), the municipality agricultural office equivalent to a US county agricultural office, to participate in the export program. Approved participation in the export program is required by Mexican regulation to export to any foreign country. Inspectors from the JLSV office begin to visit the prospective orchard biweekly for a general pest inspection. These inspections target a wide variety of avocado pests including all the pests of concern listed in 319.56-2ff excluding fruit flies. These biweekly inspections by the JLSV continue through any eventual harvest for export. The JLSV inspector works with the grower and gives them advice to manage any pest problems uncovered by the biweekly inspections.

- ◆ Once the JLSV inspector is convinced that the orchard is ready, the next step is to petition the CESV, equivalent to a US State agricultural office, to inspect and approve the orchard to become registered in the export program. The State inspectors will inspect every tree in the orchard. The inspection will certify freedom of the orchard from all avocado seed weevils, the avocado stem weevil and the avocado seed moth among other avocado pests. If the inspection is passed the orchard will be approved for the next export season. This inspection and approval is repeated yearly by the CESV inspector.

The above approval process will allow export of the Hass avocados to all countries except to the US. If the growers wants export to the US the export orchard or grower must be listed in the annual work plan submitted to APHIS by DGSV. Before DGSV will list a grower or orchard in the annual work plan for export of Hass avocados from Mexico to the US, the orchard must pass the above approval process **and** the below additional requirement.

- ◆ The orchard must be surveyed using food lure traps by the JLSV and be found free of any of the three target *Anastrepha* spp. fruit flies listed in 7 CFR 319.56-2ff for at least one year prior to being listed in the annual work plan.

The review team had extensive discussion with representatives from the DGSV and CESV concerning the approval process for a grower and orchard to be registered in the export program and listed in the annual work plan found in Appendix C. The review team found the program to be in compliance with this requirement.

Other more specific pest surveillance requirements listed in 7 CFR 319.56-2ff for orchards are as follows:

- (ii) The orchard and all contiguous orchards and properties must be surveyed annually and found to be free from the avocado stem weevil *Copturus aguacatae*. The survey must be conducted during the growing season and completed prior to the harvest of the avocados.

APHIS actively takes part in the orchard surveys that include orchards that export to the United States. The review team observed the survey of one of these orchards including the survey of a contiguous orchard and reviewed updated survey records. The review team found the program to be in compliance with this requirement. Appendix a contains photographs of the pest surveillance activities.

- (iii) Trapping must be conducted in the orchard for the fruit flies *Anastrepha ludens*, *A. serpentina*, and *A. striata* at the rate of one trap per 10 hectares.

The review team visited an export orchard and observed the proper servicing of a fruit fly detection trap, reviewed the field trapping records and the distribution of traps within the orchard. After the field observations and further review of the overall fruit fly survey records provided by DGSV, the review team found the program to be in compliance with this requirement. Appendix a contains photographs of the pest surveillance activities.

D. Other Observations

(1) Orchard Sanitation.

7 CFR 319.56-2ff has the following requirements for orchard sanitation:

- (i) Avocado fruit that has fallen from the trees must be removed from the orchard at least once every 7 days.
- (ii) Dead branches on avocado trees in the orchard must be pruned and removed from the orchard.

These requirements are to mainly mitigate the pest risk from the stem weevil, *Copturus aguacatae*, and *Anastrepha* fruit flies. The observations of the orchard during the site visit indicated that compliance with these requirements is adequate.

(2) Agricultural Quarantine Highway Checkpoints

The review team visited one of ten agricultural quarantine highway checkpoints staffed by CESV situated on the borders of all of the approved municipalities for export of Hass avocados to the United States. All fruit trucks must stop at these checkpoints both entering and leaving the municipalities to verify documentation and contents of the truck. The agricultural inspectors also make random checks of passenger vehicles and non-fruit trucks entering the municipalities as a phytosanitary measure to maintain freedom from avocado pests not known to occur in the municipality. Appendix a contains photographs of the checkpoint activities.

E. Conclusion

In conclusion, the surveillance activities used in Mexico for area and production site approvals were all found to be in compliance with 7 CFR 319.56-2ff.

JLSV's biweekly year round surveys in export orchards, CESV's yearly spring surveys from March through June of avocado export orchards, backyard avocado trees and wild avocado trees and the joint APHIS/CESV's summer survey from July through September are adequate to meet the required surveys cited in 7 CFR 319.56-2ff(c)(1)(ii), 7 CFR 319.56-2ff(c)(2), and 7 CFR 319.56-2ff(c)(2)(i). It should be noted that the fruit cutting method used to survey for the avocado seed moth, *Stenoma catenifer*, is the "the best way to detect the moth" as stated by Dr. Luis Cervantes in his site visit report.

JLSV's maintenance of the fruit fly detection program within the export municipalities is adequate to meet the required surveys cited in 7 CFR 319.56-2ff(c)(1)(iii) and 7 CFR 319.56-2ff(c)(2)(ii).

F. List of Appendices

Appendix A: Photographs of site visit.

Appendix B: 7 CFR 319.56-2ff.

Appendix C: The most recent approved work plan for the movement of Hass Avocados from Mexico to the United States of America signed October 1999.

Appendix D: Pest surveillance results for surveys performed in Mexico from 1997 until the time of the site visit.

Appendix E: Site visit report by Dr. Luis Cervantes.

Appendix F: Analysis of survey methods for avocado seed moth, stem weevil and seed weevils.

Appendix A: Photographs of site visit

Fruit Cutting 1:



Fruit Cutting 2:



Foliage Survey 1:



Foliage Survey 2:



Foliage Survey 2:



Fruit Fly Detection 2:



Agricultural Quarantine Highway Checkpoints:



Appendix B:

§ 319.56-2ff Administrative instructions governing movement of Hass avocados from Mexico to the Northeastern United States.

Fresh Hass variety avocados (*Persea americana*) may be imported from Mexico into the United States for distribution in the northeastern United States only under a permit issued in accordance with § 319.56-4, and only under the following conditions:

- (a) Shipping restrictions. (1) The avocados may be imported in commercial shipments only;
 - (2) The avocados may be imported only during the months of November, December, January, and February; and
 - (3) The avocados may be distributed only in the following northeastern States: Connecticut, Delaware, the District of Columbia, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, and Wisconsin.
- (b) Trust fund agreement. The avocados may be imported only if the Mexican avocado industry association representing Mexican avocado growers, packers, and exporters has entered into a trust fund agreement with the Animal and Plant Health Inspection Service (APHIS) for that shipping season. That agreement requires the Mexican avocado industry association to pay in advance all estimated costs that APHIS expects to incur through its involvement in the trapping, survey, harvest, and packinghouse operations prescribed in paragraph (c) of this section. These costs will include administrative expenses incurred in conducting the services and all salaries (including overtime and the Federal share of employee benefits), travel expenses (including per diem expenses), and other incidental expenses incurred by the inspectors in performing these services. The agreement requires the Mexican avocado industry association to deposit a certified or cashier's check with APHIS for the amount of those costs, as estimated by APHIS. If the deposit is not sufficient to meet all costs incurred by APHIS, the agreement further requires the Mexican avocado industry association to deposit with APHIS a certified or cashier's check for the amount of the remaining costs, as determined by APHIS, before the services will be completed. After a final audit at the conclusion of each shipping season, any overpayment of funds would be returned to the Mexican avocado industry association or held on account until needed.
- (c) Safeguards in Mexico. The avocados must have been grown in the Mexican State of Michoacan

in an orchard located in a municipality that meets the requirements of paragraph (c)(1) of this section. The orchard in which the avocados are grown must meet the requirements of paragraph (c)(2) of this section. The avocados must be packed for export to the United States in a packinghouse that meets the requirements of paragraph (c)(3) of this section. Sanidad Vegetal must provide an annual work plan to APHIS that details the activities that Sanidad Vegetal will, subject to APHIS' approval of the work plan, carry out to meet the requirements of this section; APHIS will be directly involved with Sanidad Vegetal in the monitoring and supervision of those activities. The personnel conducting the trapping and pest surveys must be hired, trained, and supervised by Sanidad Vegetal or by the Michoacan State delegate of the Secretaria de Agricultura, Ganaderia y Desarrollo Rural (SAGDR).

(1) Municipality requirements. (i) The municipality must be listed as an approved municipality in the annual work plan provided to APHIS by Sanidad Vegetal.

(ii) The municipality must be surveyed at least annually and found to be free from the large avocado seed weevil *Heilipus lauri*, the avocado seed moth *Stenoma catenifer*, and the small avocado seed weevils *Conotrachelus aguacatae* and *C. perseae*. The survey must cover at least 300 hectares in the municipality and include randomly selected portions of each registered orchard and areas with wild or backyard avocado trees. The survey must be conducted during the growing season and completed prior to the harvest of the avocados.

(iii) Trapping must be conducted in the municipality for Mediterranean fruit fly (Medfly) (*Ceratitis capitata*) at the rate of 1 trap per 1 to 4 square miles. Any findings of Medfly must be reported to APHIS.

(2) Orchard and grower requirements. The orchard and the grower must be registered with Sanidad Vegetal's avocado export program and must be listed as an approved orchard or an approved grower in the annual work plan provided to APHIS by Sanidad Vegetal. The operations of the orchard must meet the following conditions:

(i) The orchard and all contiguous orchards and properties must be surveyed annually and found to be free from the avocado stem weevil *Copturus aguacatae*. The survey must be conducted during the growing season and completed prior to the harvest of the avocados.

(ii) Trapping must be conducted in the orchard for the fruit flies *Anastrepha ludens*, *A. serpentina*, and *A. striata* at the rate of one trap per 10 hectares. If one of those fruit flies is trapped, at least 10 additional traps must be deployed in a 50-hectare area immediately surrounding the trap in which the fruit fly was found. If within 30 days of the first finding any additional fruit flies are trapped within the 260-hectare area surrounding the first finding, malathion bait treatments must be applied in the affected orchard in order for the orchard to remain eligible to export avocados.

(iii) Avocado fruit that has fallen from the trees must be removed from the orchard at least once every 7 days and may not be included in field boxes of fruit to be packed for export.

(iv) Dead branches on avocado trees in the orchard must be pruned and removed from the orchard.

(v) Harvested avocados must be placed in field boxes or containers of field boxes that are marked to show the Sanidad Vegetal registration number of the orchard. The avocados must be moved from the orchard to the packinghouse within 3 hours of harvest or they must be protected from fruit fly infestation until moved.

(vi) The avocados must be protected from fruit fly infestation during their movement from the orchard to the packinghouse and must be accompanied by a field record indicating that the avocados originated from a certified orchard.

(3) Packinghouse requirements. The packinghouse must be registered with Sanidad Vegetal's avocado export program and must be listed as an approved packinghouse in the annual work plan provided to APHIS by Sanidad Vegetal. The operations of the packinghouse must meet the following conditions:

(i) During the time the packinghouse is used to prepare avocados for export to the United States, the packinghouse may accept fruit only from orchards certified by Sanidad Vegetal for participation in the avocado export program.

(ii) All openings to the outside must be covered by screening with openings of not more than 1.6 mm or by some other barrier that prevents insects from entering the packinghouse.

(iii) The packinghouse must have double doors at the entrance to the facility and at the interior entrance to the area where the avocados are packed.

(iv) Prior to the culling process, a sample of 300 avocados per shipment must be selected, cut, and inspected by Sanidad Vegetal and found free from pests.

(v) The identity of the avocados must be maintained from field boxes or containers to the shipping boxes so the avocados can be traced back to the orchard in which they were grown if pests are found at the packinghouse or the port of first arrival in the United States.

(vi) Prior to being packed in boxes, each avocado fruit must be cleaned of all stems, leaves, and other portions of plants and labeled with a sticker that bears the Sanidad Vegetal registration number of the packinghouse.

(vii) The avocados must be packed in clean, new boxes. The boxes must be clearly marked with the identity of the grower, packinghouse, and exporter, and the statement "Distribution limited to the following States: CT, DC, DE, IL, IN, KY, ME, MD, MA, MI, NH, NJ, NY, OH, PA, RI, VA, VT, WV, and WI."

(viii) The boxes must be placed in a refrigerated truck or refrigerated container and remain in that truck or container while in transit through Mexico to the port of first arrival in the United States. Prior to leaving the packinghouse, the truck or container must be secured by Sanidad Vegetal with a seal that will be broken when the truck or container is opened. Once sealed, the refrigerated

truck or refrigerated container must remain unopened until it reaches the port of first arrival in the United States.

(ix) Any avocados that have not been packed or loaded into a refrigerated truck or refrigerated container by the end of the work day must be kept in the screened packing area.

(d) Certification. All shipments of avocados must be accompanied by a phytosanitary certificate issued by Sanidad Vegetal certifying that the conditions specified in this section have been met.

(e) Pest detection. (1) If any of the avocado seed pests *Heilipus lauri*, *Conotrachelus aquacatae*, *C. perseae*, or *Stenoma catenifer* are discovered in a municipality during an annual pest survey, orchard survey, packinghouse inspection, or other monitoring or inspection activity in the municipality, Sanidad Vegetal must immediately initiate an investigation and take measures to isolate and eradicate the pests. Sanidad Vegetal must also provide APHIS with information regarding the circumstances of the infestation and the pest risk mitigation measures taken. The municipality in which the pests are discovered will lose its pest-free certification and avocado exports from that municipality will be suspended until APHIS and Sanidad Vegetal agree that the pest eradication measures taken have been effective and that the pest risk within that municipality has been eliminated.

(2) If Sanidad Vegetal discovers the stem weevil *Copturus aguacatae* in an orchard during an orchard survey or other monitoring or inspection activity in the orchard, Sanidad Vegetal must provide APHIS with information regarding the circumstances of the infestation and the pest risk mitigation measures taken. The orchard in which the pest was found will lose its export certification immediately and will be denied export certification for the entire shipping season of November through February.

(3) If Sanidad Vegetal discovers the stem weevil *Copturus aguacatae* in fruit at a packinghouse, Sanidad Vegetal must investigate the origin of the infested fruit and provide APHIS with information regarding the circumstances of the infestation and the pest risk mitigation measures taken. The orchard where the infested fruit originated will lose its export certification immediately and will be denied export certification for the entire shipping season of November through February.

(f) Ports. The avocados may enter the United States at:

(1) Any port located in the northeastern States specified in paragraph (a)(3) of this section;

(2) The ports of Galveston or Houston, TX, or the border ports of Nogales, AZ, or Brownsville, Eagle Pass, El Paso, Hidalgo, or Laredo, TX; or

(3) Other ports within that area of the United States specified in paragraph (g) of this section.

(g) Shipping areas. Except as explained below in this paragraph for avocados that enter the United States at Nogales, AZ, avocados moved by truck or rail car may transit only that area of the United States bounded on the west by a line extending from El Paso, TX, to Denver, CO, and due north

from Denver; and on the east and south by a line extending from Brownsville, TX, to Galveston, TX, to Kinder, LA, to Memphis, TN, to Knoxville, TN, following Interstate 40 to Raleigh, NC, and due east from Raleigh. All cities on these boundary lines are included in this area. If the avocados are moved by air, the aircraft may not land outside this area. Avocados that enter the United States at Nogales, AZ, must be moved to El Paso, TX, by the route specified on the permit, and then must remain within the shipping area described above in this paragraph.

(h) Shipping requirements. The avocados must be moved through the United States either by air or in a refrigerated truck or refrigerated rail car or in a refrigerated container on a truck or rail car. If the avocados are moved in a refrigerated container on a truck or rail car, an inspector must seal the container with a serially numbered seal at the port of first arrival in the United States. If the avocados are moved in a refrigerated truck or a refrigerated rail car, an inspector must seal the truck or rail car with a serially numbered seal at the port of first arrival in the United States. If the avocados are transferred to another vehicle or container in the United States, an inspector must be present to supervise the transfer and must apply a new serially numbered seal. The avocados must be moved through the United States under Customs bond.

(i) Inspection. The avocados are subject to inspection by an inspector at the port of first arrival, at any stops in the United States en route to the northeastern States, and upon arrival at the terminal market in the northeastern States. At the port of first arrival, an inspector will sample and cut avocados from each shipment to detect pest infestation.

(j) Repackaging. If any avocados are removed from their original shipping boxes and repackaged, the stickers required by paragraph (c)(3)(vi) of this section may not be removed or obscured and the new boxes must be clearly marked with all the information required by paragraph (c)(3)(vii) of this section.

(k) Compliance agreements. (1) Any person, other than the permittee, who moves or distributes the avocados following their importation into the United States (i.e., a second-party or subsequent handler) must enter into a compliance agreement with APHIS. In the compliance agreement, the person must acknowledge, and agree to observe, the requirements of paragraph (a) and paragraphs (f) through (k) of this section. Compliance agreement forms are available, free of charge, from local offices of Plant Protection and Quarantine, which are listed in local telephone directories. A compliance agreement will not be required for an individual place of business that only offers the avocados for sale directly to consumers.

(2) Before transferring the avocados to any person (i.e., a second-party handler) for movement or distribution, the permittee must confirm that the second-party handler has entered into a compliance agreement with APHIS as required by paragraph (k)(1) of this section. If the permittee transfers the avocados to a second-party handler who has not entered into a compliance agreement, APHIS may revoke the permittee's import permit for the remainder of the current shipping season.

(3) Any second-party or subsequent handler who transfers the avocados to another person for movement or distribution must confirm that the person receiving the avocados has entered into a compliance agreement with APHIS as required by paragraph (k)(1) of this section. If the second-party or subsequent handler transfers the avocados to a person who has not entered into a

compliance agreement, APHIS may revoke the handler's compliance agreement for the remainder of the current shipping season.

(4) Action on repeat violators. APHIS may deny an application for an import permit from, or refuse to enter into a compliance agreement with, any person who has had his or her import permit or compliance agreement revoked under paragraph (k)(2) or (k)(3) of this section twice within any 5-year period. (Approved by the Office of Management and Budget under control number 0579-0129.)

[62 FR 5313, Feb. 5, 1997, as amended at 64 FR 68005, Dec. 6, 1999]

Appendix C:

WORK PLAN FOR THE EXPORTATION OF HASS AVOCADOS FROM MEXICO TO THE UNITED STATES OF AMERICA

Operated under cooperative agreement between the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), the Secretaría de Agricultura Ganadería y Desarrollo Rural (SAGAR), and the Comisión Nacional de Sanidad Agropecuaria (CONASAG) represented by Dirección General de Sanidad Vegetal (DGSV).

This work plan was developed jointly by the United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA,APHIS,PPQ) and United States Department of Agriculture, Animal and Plant Health Inspection Service, International Services (USDA,API-HS,IS), and the Dirección General de Sanidad (DGSV), Secretaría de Agricultura Ganadería y Desarrollo Rural (SAGAR), Comisión Nacional de Sanidad Agropecuaria (CONASAG), and will be used as a guide for the exportation of Hass avocados from Mexico to the United States of America. Deviation from these guidelines is not authorized unless previous approval is given by all parties. All deviation will be documented in writing.

This work plan will be in force until a new one is approved and signed by both parties.

Concur on October 29, 1999.

Dr. ELBA QUINTERO
Regional Director
USDA, APHIS, International Services,
North America and the Caribbean Region.

PLAN DE TRABAJO PARA LA EXPORTACIÓN DE AGUACATE HASS DE MEXICO A LOS ESTADOS UNIDOS DE NORTE AMERICA

Operado bajo el Acuerdo Cooperativo del U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), la Secretaría de Agricultura Ganadería y Desarrollo Rural (SAGAR) y la Comisión Nacional de Sanidad Agropecuaria (CONASAG), representada por la Dirección General de Sanidad Vegetal (DGSV).

Este plan de trabajo fue desarrollado conjuntamente por el United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA,APHIS,PPQ), el United States Department of Agriculture, Animal and Plant Health Inspection Service, International Services (USDA,APHIS,IS) y por la Secretaría de Agricultura, Ganadería y Desarrollo Rural (SAGAR) y la Comisión Nacional de Sanidad Agropecuaria (CONASAG), a través de la Dirección General de Sanidad Vegetal (DGSV) y será usado como una guía para la exportación de aguacate Hass de México a los Estados Unidos de Norteamérica. No se autoriza la variación de estos lineamientos, a menos de que sean previamente aprobados por ambas partes. Cualquier desviación de los conceptos aquí mencionados deberá documentarse por escrito.

Este plan de trabajo estará vigente hasta que una nueva versión sea aprobada y firmada por ambas partes.

Acordado el 29 de octubre del 1999.

Dr. LUIS ALBERTO AGUIRRE URIBE
Director General de
Sanidad Vegetal,
Comisión Nacional de Sanidad Agropecuaria,
SAGAR.

WORK PLAN FOR EXPORTATION OF HASS AVOCADOS FROM MEXICO TO THE UNITED STATES

I. Introduction

1. The purpose of this document is to specify the guidelines that allow the exportation of Hass avocados from the Mexican State of Michoacan to the States of Connecticut, Delaware, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, Wisconsin and the District of Columbia during the months of November, December, January and February of each year and to assure uniformity of procedures between the participants.

2. The procedures outlined in this work plan are designed to assure that the shipments of Hass avocado that are destined for exportation to the United States, and originated in Michoacan Mexico, are free of the following fruit flies: (*Anastrepha ludens*, *A. serpentina*, and *striata*), seed pests (*Conotrachelus aguacatae*, *Conotrachelus perseae*, *Heilipus lauri*, and *Stenoma catenifer*) and the stem weevil (*Copturus aguacatae*).

3. SAGAR/CONASAG/DGSV has designated certain municipalities in the state of Michoacán as areas that produce Hass avocados for exportation to the United States. Within these municipalities are located orchards that are certified to export under the terms of this work plan.

4. The procedures defined in this work plan are specific for Hass avocados.

II. Organizations that are Participants of the Work Plan

PLAN DE TRABAJO PARA LA EXPORTACION DE AGUACATE HASS DE MEXICO A LOS ESTADOS UNIDOS

I. Introducción

1. Este documento tiene el propósito de especificar los lineamientos que permiten la exportación de aguacate Hass del estado mexicano de Michoacán a los estados de Connecticut, Delaware, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, Nueva Hampshire, Nueva Jersey, Nueva York, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, Wisconsin y el Distrito de Columbia durante los meses de noviembre, diciembre, enero y febrero de cada año, así como de asegurar la uniformidad de procedimientos utilizados por los participantes.

2. Los procedimientos descritos en este plan de trabajo están diseñados para asegurar que los envíos de aguacate Hass destinados para exportación a los Estados Unidos y originarios de Michoacán, México estén libres de las siguientes moscas de la fruta (*Anastrepha ludens*, *A. serpentina* y *A. striata*), plagas del hueso del aguacate (*Conotrachelus aguacatae*, *Conotrachelus perseae*, *Heilipus lauri* y *Stenoma catenifer*) y el barrenador de las ramas (*Copturus aguacatae*).

3. SAGAR/CONASAG/DGSV ha designado a ciertos municipios del estado de Michoacán como áreas productoras de aguacate Hass para exportación a los Estados Unidos. En estos municipios se localizan huertos certificados para exportar, según las condiciones de este plan de trabajo.

4. Los procedimientos que se indican en este plan de trabajo son específicos para aguacate Hass.

II. Organizaciones participantes en el Plan de Trabajo

The work plan for the exportation of Hass avocados from Mexico to the United States from hereafter will be referred to as "the work plan" and will be used by the participants listed below.

1. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA-APHIS-PPQ) and U.S. Department of Agriculture, Animal and Plant Health Inspection Service, International Services (USDA/APHIS-IS) referred to in this work plan as "APHIS".

2. The Secretariat of Agriculture, Livestock and Rural Development, National Commission of Animal and Plant Health (SAGAR/CONASAG/DGSV) referred to in this work plan as "DGSV".

3. State Delegation of the Secretariat of Agriculture, Livestock and Rural Development of the State of Michoacán, through the Plant Health Program Directorate in Morelia, Michoacan (SAGAR/CONASAG/PSV) referred to in this work plan as "PSV".

4. Avocado growers (producers) are from here on referred to as "growers."

5. Avocado packers/exporters from here on referred to as "packers/exporters."

III. Responsibility of the Participants

1. APHIS will have the following responsibilities:

1.1. APHIS will require a supervisory program funded through an APHIS/industry cooperative service agreement. This program will be established before beginning the activities of the work plan.

El plan de trabajo para la exportación de aguacate Hass de México a los Estados Unidos (en lo sucesivo llamado "el plan de trabajo") será utilizado por los participantes que se enumeran a continuación.

1. El Departamento de Agricultura de los Estados Unidos, Servicio de Inspección de Salud Animal y Vegetal, Protección y Cuarentena Vegetal, (USDA-APHIS-PPQ) y el Departamento de Agricultura de los Estados Unidos, Servicios de Inspección de Salud Animal y Vegetal, área de Servicios Internacionales (USDA-APHIS-IS) se denominarán en este plan de trabajo como "APHIS."

2. La Secretaría de Agricultura, Ganadería y Desarrollo Rural, Comisión Nacional de Sanidad Agropecuaria (SAGAR/CONASAG/DGSV), denominándose en este plan de trabajo como "DGSV."

3. La Delegación Estatal de la Secretaría de Agricultura, Ganadería y Desarrollo Rural del Estado de Michoacán, por medio de la dirección del Programa de Sanidad Vegetal de Morelia, Michoacán (SAGAR/CONASAG/PSV), se denomina en este plan de trabajo como "PSV".

4. Productores de aguacate, en lo sucesivo llamados "los productores".

5. Empacadores/exportadores de aguacate, en lo sucesivo llamados "los empacadores/exportadores).

III. Responsabilidad de los participantes

1. APHIS tendrá las siguientes responsabilidades:

1.1 APHIS requerirá un programa de supervisión financiado por un acuerdo de servicio cooperativo entre APHIS y los productores/empacadores. Este programa se establecerá antes de que se inicien las actividades del plan de trabajo.

1.2 APHIS inspectors will provide management and supervision of the trapping, surveys, harvesting and shipping protocols outlined in this work plan through the APHIS Regional Director in Mexico city.

1.3 APHIS will verify that the participants in this work plan are complying with their responsibilities.

1.4 APHIS will provide and maintain an annual Work Plan for the Program.

1.5 APHIS will provide additional personnel to assist in program activities as dictated by the workload and supervisory needs, subject to availability of personnel.

2. DGSV will have the following responsibilities:

2.1 To administer and supervise the work plan

2.2 To approve, select and certify the municipalities, orchards, and packers that have registered to participate in this export program in compliance with the guidelines established in this work plan. To monitor the fruit fly populations and insure the absence of seed and stem weevils.

2.3 To supply APHIS with a list of all registered packing houses and orchards on or before July 1 for inclusion in this work plan. Orchard maps and plans for fruit fly proofing of packinghouses should be included in this information.

2.4 To inform APHIS about the inscription codes assigned to the orchards and packers.

2.5 To immediately inform APHIS of any pest problems encountered during the activities outlined in this work plan.

2.6 To verify that certified packing houses which knowingly accept fruit from uncertified orchards or fruit that was previously rejected by DGSV automatically lose their certification to export to the United States.

1.2 Los inspectores de APHIS proporcionarán la administración y supervisión de los protocolos de muestreo, trampeo, cosecha y de envío, descritos en este plan de trabajo, por medio del Director Regional de APHIS en la ciudad de México.

1.3 APHIS verificará que los participantes de este plan de trabajo cumplan con sus responsabilidades.

1.4 APHIS proporcionará y mantendrá un Plan de Trabajo anual para el programa.

1.5 APHIS proporcionará personal adicional para ayudar en las actividades del programa, según lo requieran la carga de trabajo y las necesidades de supervisión, sujeto a la disponibilidad de personal.

2. La DGSV tendrá las siguientes responsabilidades:

2.1 Administrar y supervisar el plan de trabajo.

2.2 Aprobar, seleccionar y certificar los municipios, huertos y empacadores que se hayan registrado para participar en este programa de exportación, en cumplimiento de las directrices de este plan de trabajo. Monitorear las poblaciones de moscas de la fruta y asegurar la ausencia de barrenadores del hueso y de las ramas del aguacate.

2.3 Proporcionar a APHIS antes del 1 de Julio, la lista de todos los huertos y empacadoras registrados para participar en este plan de trabajo. También se deben incluir los mapas con los huertos y planos de las empacadoras con protección para moscas de la fruta.

2.4 Proporcionar a APHIS las claves de inscripción asignadas a los huertos y empacadores.

2.5 Informar inmediatamente a APHIS de cualquier problema de plagas que se encuentre durante las actividades descritas en este plan de trabajo.

2.6 Verificar que las empacadoras certificadas, que a sabiendas acepten aguacate de huertos no certificados o previamente rechazados por DGSV, automáticamente pierdan su certificación para exportar a los Estados Unidos.

2.7 To approve, select and hire the necessary personnel to log in and carry out the sampling of each avocado shipment destined to the United States and insure that the fruit cutting is performed as describes in this work plan.

2.8 To approve, select and hire the necessary personnel to provide technical assistance. To monitor fruit fly trapping, and participate in the stem weevil and seed pest surveys. Also, DGSV and APHIS will supervise the application of phytosanitary controls for seed pests and stem weevils described in this work plan and will maintain a logbook of these phytosanitary activities. DGSV will insure correct compliance of each producer's responsibility.

2.9 To immediately suspend the export certification of those orchards or municipalities registered in the program when appropriate as describes in this work plan.

2.10 To immediately suspend the export certification of the packing houses registered in the program identified as a source of fruit infested with a pest listed in this work plan during the phytosanitary inspection in the United States. The suspension of the packing house will be in effect until an investigation is completed, corrective actions are taken and PPQ and DGSV agree that these particular packers should be allowed to export again.

2.11 To make supervisory visits in coordination with PSV to the areas of production, packing, inspection, certification and shipment of Hass avocados for export to the United States.

3. PSV will have the following responsibilities:

3.1 To register the avocado orchards and packers that are interested in exporting to the United States, verifying their compliance to adequately monitor fruit fly populations and insure the absence of seed pests and stem weevils.

2.7 Aprobar, seleccionar y contratar el personal necesario para registrar y muestrear todos los envíos de aguacate con destino a los Estados Unidos, y asegurar que se corten las muestras de aguacate según se describe en este plan de trabajo.

2.8 Aprobar, seleccionar y contratar el personal necesario para proporcionar asistencia técnica. Monitorear el trapeo de moscas de la fruta y participar en los muestreos del barrenador de las ramas y barrenador del hueso. Además, la DGSV y APHIS supervisarán la aplicación de controles fitosanitarios para plagas del hueso y barrenadores de las ramas descritos en este plan de trabajo y mantendrán una bitácora de estas actividades fitosanitarias. La DGSV asegurará el cumplimiento correcto de la responsabilidad de cada productor.

2.9 Suspender inmediatamente la certificación para exportar de los huertos o municipios registrados en el programa, de acuerdo a lo que se establece en este plan de trabajo.

2.10 Suspender inmediatamente la certificación de exportación de las empacadoras registradas en el programa que se identifiquen como origen de aguacate infestados durante la inspección fitosanitaria en los Estados Unidos. La suspensión de la empacadora se mantendrá hasta que se lleve al cabo una investigación, se tomen las medidas correctivas, y PPQ y DGSV estén de acuerdo en que se puede permitir nuevamente que exporten esas empacadoras en particular.

2.11 Efectuar visitas de supervisión en coordinación con el PSV a las áreas de producción, empaque, inspección, certificación y envío de aguacate Hass para exportación a los Estados Unidos.

3. El PSV tendrá las siguientes responsabilidades:

3.1 Registrar los huertos y empacadoras de aguacate interesados en exportar a los Estados Unidos, verificando el cumplimiento de un monitoreo adecuado de las poblaciones de moscas de la fruta y de asegurar la ausencia de plagas del hueso y barrenadores de las ramas.

3.2 To furnish DGSV with the list of registered orchards and packing houses, including the codes and numbers that have been assigned to each of them.

3.3 To conduct the seed pest and stem weevil surveys and trap for fruit flies according to the specifications outlined in this work plan

3.4 To issue export phytosanitary documentation, verifying the compliance with packing and shipping specifications outlined in this work plan.

3.5 To make sure that the growers and packinghouses are in compliance with requirements relative to origin, transportation to the packing company, selection, packing, inspection, certification and transportation to the point of entry to the United States. Also PSV will take corrective actions in coordination with DGSV when procedural errors are discovered.

3.6 To refuse phytosanitary certification of shipments infested with pests of quarantine significance.

3.7 To verify that the avocados are cleaned of stems, leaves and other portions of plants and placed in boxes that are properly marked in accordance with this work plan.

4. The growers have the following responsibilities:

4.1 To comply with all the requirements mentioned in the work plan regarding orchards and transportation to the packinghouse.

4.2 To furnish PSV with information regarding the location of the orchards that produce avocados for exportation to the United States.

3.2 Proporcionar a la DGSV una lista de empacadoras y huertos registrados, incluyendo las claves y números que se hayan asignado a cada una.

3.3 Llevar a cabo los muestreos de plagas del hueso y barrenadores de las ramas y hacer trampeo de moscas de la fruta, de acuerdo con las especificaciones de este plan de trabajo.

3.4 Expedir la documentación fitosanitaria para exportación, verificando el cumplimiento de las especificaciones de empaque y envío descritas en este plan de trabajo.

3.5 Asegurar que los productores y las empacadoras cumplan con los requisitos de origen, transporte a la empacadora, selección, empaque, inspección, certificación y transporte hasta el punto de entrada a los Estados Unidos. El PSV también tomará medidas correctivas, en coordinación con la DGSV, cuando se descubra cualquier error de procedimiento.

3.6 Negar la certificación fitosanitaria a envíos que estén infestados con plagas de importancia cuarentenaria.

3.7 Verificar que los aguacates estén limpios de tallos, hojas y otras partes de plantas y colocados en cajas debidamente marcadas de acuerdo con este plan de trabajo.

4. Los productores tendrán las siguientes responsabilidades:

4.1 Cumplir con todos los requisitos que se mencionan en el plan de trabajo en relación con huertos y transporte a la empacadora.

4.2 Proporcionar al PSV información sobre la ubicación de los huertos que producen aguacate para exportación a los Estados Unidos.

4.3 To register with PSV and furnish the location of the orchards complying with this work plan and obtain certification from DGSV to export to the United States.

4.4 To cooperate with PSV and DGSV to carry out the survey for seed pests and the stem weevil and the monitoring of fruit fly trapping activities. The orchards will also carry out phytosanitary controls and orchard sanitation as determined by PSV and outlined in this work plan.

4.5 To ship avocados to the United States only through a packinghouse that is registered with PSV and certified by DGSV.

4.6 To participate in the trust fund agreement providing the necessary capital for APHIS personnel, as well as the materials and equipment necessary to carry out the activities and the supervision of the work plan.

5. Packers and Exporters have the following responsibilities:

5.1 To comply with the requirements of the packing, identification, transportation, and security of the Hass avocado shipments for export to the United States, as established by this work plan.

5.2 To register the packinghouse with PSV and gain DGSV certification for export to the United States.

5.3 To supply DGSV with plans or drawings detailing the modifications which need to be made to each registered packinghouse that enables them to comply with the requirements of this work plan.

4.3 Registrar con el PSV y proporcionar la ubicación de huertos que cumplen con este plan de trabajo y obtener certificación de la DGSV para exportar a los Estados Unidos.

4.4 Cooperar con el PSV y la DGSV para efectuar los muestreos de plagas del hueso y del barrenador de las ramas, y el monitoreo de las actividades de trapeo de moscas de la fruta. Los huertos también deben efectuar controles fitosanitarios y saneamiento del huerto, según lo determine el PSV y se describa en este plan de trabajo.

4.5 Enviar aguacate a los Estados Unidos únicamente por medio de una empacadora registrada con el PSV y certificada por la DGSV.

4.6 Participar en el acuerdo para el fideicomiso que aporta el capital necesario para pagar el personal de APHIS, así como los materiales y equipo necesario para llevar a cabo las actividades y la supervisión del plan de trabajo.

5. Las empacadoras y los exportadores tendrán las siguientes responsabilidades:

5.1 Cumplir con los requisitos de empaque, identificación, transporte y seguridad de los cargamentos de aguacate Hass para exportación a los Estados Unidos, según lo establece este plan de trabajo.

5.2 Registrar la empacadora con el PSV y obtener la certificación de la DGSV para exportación a los Estados Unidos.

5.3 Proporcionar a DGSV los planos o croquis con detalles de las modificaciones que se tienen que hacer en cada empacadora registrada para que puedan cumplir con los requisitos de este plan de trabajo.

5.4 During the time the packinghouse is used to prepare avocados for export to the United States, it may accept fruit only from orchards certified by DGSV for participation in the avocado export program. To prevent contamination, packing areas must be cleaned of fruit and plant debris from uncertified orchards prior to packing fruit for export to the United States.

5.5 To participate in the trust fund agreement providing the necessary capital for APHIS personnel, as well as the materials and equipment necessary to carry out the activities and the supervision of the work plan.

5.6 To participate in this export program to the United States through one Association that is recognized by DGSV. This Association will be the official liaison with DGSV and APHIS regarding financial matters derived from the operation of this work plan.

IV. OPERATIONAL PROCEDURES

1. Municipalities

1.1 In order for a certified orchard to be considered for exportation to the United States, it must be located within the municipalities of Periban, Salvador Escalante, Tancitaro, Uruapan or Nuevo Parangaricutiro.

1.2 The municipalities listed above must be surveyed at least annually and found to be free from the large avocado seed weevil *Heilipus lauri*, the avocado seed moth *Stenoma catenifer*, and the small avocado seed weevils *Conotrachelus aguacatae* and *C. perseae*. The survey must cover at least 300 hectares in the municipality and include randomly selected portions of each registered orchard and areas with wild or backyard avocado trees. The survey must be conducted during the growing season and completed prior to harvest.

5.4 Mientras se esté usando la empacadora para empacar aguacate para exportación a los Estados Unidos, sólo podrá aceptar fruta de huertos certificados por la DGSV para participar en el programa de exportación de aguacate. Para prevenir contaminación, las áreas de empaque deben estar limpias de fruta y residuos vegetales provenientes de huertos no certificados, previamente a que se empaque fruta para exportación a los Estados Unidos.

5.5 Participar en el acuerdo para el fideicomiso que aporta el capital necesario para pagar el personal de APHIS, así como los materiales y equipo necesario para llevar a cabo las actividades y la supervisión del plan de trabajo.

5.6 Participar en este programa de exportación a los Estados Unidos por medio de una asociación reconocida por la DGSV. Esta asociación será el enlace oficial con DGSV y APHIS en cuanto a asuntos financieros derivados de la implementación de este plan de trabajo.

IV. PROCEDIMIENTOS OPERATIVOS

1. Municipios

1.1 Con el fin de que un huerto certificado sea tomado en cuenta para exportación a los Estados Unidos, debe estar ubicado dentro de los municipios de Peribán, Salvador Escalante, Tancítaro, Uruapan y Nuevo Parangaricutiro.

1.2 En los municipios enlistados anteriormente, se debe hacer un muestreo por lo menos una vez al año, con resultados negativos para el barrenador grande del hueso del aguacate *Heilipus lauri*, la palomilla del hueso del aguacate *Stenoma catenifer*, y los barrenadores pequeños de la semilla del aguacate *Conotrachelus aguacatae* y *C. perseae*. El muestreo debe cubrir por lo menos 300 hectáreas del municipio, incluyendo partes seleccionadas al azar de cada huerto, así como áreas con árboles de aguacate silvestres o de patio. El muestreo debe realizarse durante la temporada de desarrollo del fruto y debe concluirse antes de la cosecha.

1.3 Trapping must be conducted in the municipality for Mediterranean fruit fly (Medfly) (*Ceratitis capitata*) using Jackson Traps with Tri-Med-lure at the rate of one trap per one to four square miles. Any findings of Medfly must be reported immediately to DGSV and then to APHIS.

1.4 If one of the seed pests *Heilipus lauri*, *Conotrachelus aguacatae*, *C. perseae*, or *Stenoma catenifer* is discovered in a certified municipality during an annual pest survey, orchard survey, packinghouse inspection, port of entry inspection, or other monitoring or inspection activity, DGSV must initiate an investigation and take measures to isolate and eradicate the pests immediately. DGSV must also provide APHIS with information regarding the circumstances of the infestation and the pest risk mitigation measures taken. The municipality in which the pests are discovered will lose its pest-free certification and avocado exports from that municipality will be suspended until APHIS and DGSV agree that the recommended spray programs have been effective and negative survey results confirm that the pest risk within that municipality has been eliminated.

2. Orchards

2.1 The orchards registered with PSV must be certified by DGSV following the specific procedures outlined in this work plan.

2.2 PSV will provide DGSV with the list of registered orchards by June 15. DGSV will issue a certificate of registration to the orchard after a determination is made that the orchard can comply with the certification procedures as established by DGSV. Export certification will be granted after the surveys reveal freedom from seed pests and stem weevils.

1.3 En el municipio se debe realizar trapeo para mosca del Mediterráneo (Moscamed) (*Ceratitis capitata*), utilizando trampas Jackson con Trimed-lure, a razón de una trampa por una a cuatro millas cuadradas. Cualquier detección de mosca del Mediterráneo debe reportarse inmediatamente a DGSV quien a su vez notificarán al APHIS.

1.4 Si al efectuar el muestreo anual de plagas, el muestreo de huertos, la inspección de empacadora, la inspección en el puerto de ingreso o cualquier otra actividad de monitoreo o inspección se encuentra cualquiera de las plagas del hueso, - *Heilipus lauri*, *Conotrachelus aguacatae*, *C. perseae* o *Stenoma catenifer*, la DGSV deberá iniciar una investigación y tomar medidas para aislar y erradicar las plagas inmediatamente. La DGSV también debe proporcionarle a APHIS información acerca de las circunstancias de la infestación y las medidas tomadas para reducir el riesgo de las plagas. El municipio en que se hayan detectado plagas perderá su certificación de estar libre de las mismas, y se suspenderán las exportaciones de aguacate de ese municipio hasta que APHIS y DGSV acuerden que los programas recomendados de aspersión han sido eficaces y que los resultados negativos de los muestreos confirmen que se ha eliminado el riesgo de la plaga en ese municipio.

2. Los huertos

2.1 Los huertos registrados con el PSV deben ser certificados por la DGSV, siguiendo los procedimientos específicos descritos en este plan de trabajo.

2.2 El PSV proporcionará a la DGSV la lista de huertos registrados antes del 15 de junio. La DGSV le expedirá al huerto un certificado de registro después de determinar que el huerto cumplen con los procedimientos de certificación establecidos por la DGSV. Se concederá la certificación para exportar cuando los muestreos indiquen que está libre de barrenadores del hueso y las ramas.

2.3 By July 1, DGSV will provide APHIS with the maps of the orchards that are registered to export to the United States. This information is necessary prior to the start of the trapping and survey program.

2.4 The registered orchard and all contiguous orchards and properties must be surveyed annually and found to be free from the avocado stem weevil (*Copturus aguacatae*). The survey must be conducted during the growing season and completed prior to harvest.

2.5 The registered orchards will be surveyed for seed pests and the stem weevil annually and trapped for fruit flies during the growing season. These surveys will be conducted by PSV and supervised jointly by APHIS and DGSV.

2.6 The fruit fly trapping conducted in the orchard for *Anastrepha ludens*, *A. serpentina*, and *A. striata* must be done at the rate of one trap per 10 hectares. At least 10 additional traps must be deployed in a 50-hectare area immediately surrounding the trap in which the fruit fly was captured. If within 30 days of the first finding any additional fruit flies are trapped within the 260-hectare area surrounding the first finding, Malathion bait treatments must be applied every 7- 10 days in the affected orchard in order for the orchard to remain eligible to export avocados.

2.7 If a stem weevil (*Copturus aguacatae*) is discovered, in a certified orchard during an orchard survey or other monitoring or inspection activity, DGSV must provide APHIS with information regarding the circumstances of the infestation and the mitigation measures taken. The certified orchard in which the pest was found will lose its export certification immediately and will be denied this certification for the entire shipping season of November through February.

2.3 Antes del 1 de julio, la DGSV le proporcionará a APHIS mapas con los huertos registrados para exportar a los Estados Unidos. Esta información es necesaria antes de que se inicien los programas de trapeo y muestreo.

2.4 El huerto registrado y todos los huertos y predios contiguos deberán ser muestreados anualmente, y debe determinarse que están libres del barrenador de las ramas del aguacate (*Copturus aguacatae*). El muestreo debe realizarse durante la temporada de desarrollo del fruto y concluirse antes de la cosecha.

2.5 Los huertos registrados serán muestreados cada año, para determinar la presencia de plagas del hueso y del barrenador de las ramas y se realizará un trapeo para moscas de la fruta durante la temporada de desarrollo del fruto. Estos muestreos serán realizados por el PSV bajo la supervisión conjunta de APHIS y la DGSV.

2.6 El trapeo de moscas de la fruta que se realice en el huerto para detectar *Anastrepha ludens*, *A. serpentina* y *A. striata* debe hacerse a razón de una trampa por cada 10 hectáreas. Deben colocarse por lo menos 10 trampas adicionales en un área de 50 hectáreas inmediatamente alrededor de la trampa en que se capture una mosca de la fruta. Si en menos de 30 días después de la primera detección se capturan más moscas de la fruta dentro de un área de 260 hectáreas alrededor de la primera, se deberán aplicar tratamientos de malatión-cebo cada 7 - 10 días en el huerto afectado, con el fin de que dicho huerto siga siendo aceptable para la exportación de aguacate.

2.7 Si durante un muestreo o cualquier otra actividad de monitoreo o inspección se descubre en un huerto un barrenador de las ramas, *Copturus aguacatae*, la DGSV debe proporcionar a APHIS información sobre las circunstancias de la infestación y las medidas de mitigación tomadas. El huerto en que se encontró la plaga perderá inmediatamente su certificación para exportar, y se le negará dicha certificación durante toda la temporada de exportación, desde noviembre hasta febrero.

2.8 If a stem weevil (*Copturus aguacatae*) is discovered on property contiguous to a certified orchard, the insecticide applications recommended by DGSV will commence immediately on the infested property. The certified orchard bordering the infestation will be immediately surveyed, and will be surveyed weekly thereafter to assure freedom from stem weevil. The weekly surveys will concentrate on the trees nearest the line delineating the certified orchard and the infested property, and will consist of foliage sampling and visual inspections of branches for larvae or pupae.

2.9 The certified growers participating in the program must pick up fallen fruit no later than October 24, and every seven days thereafter. Also, dead branches must be pruned and removed from the orchard regularly.

2.10 Harvested avocados must be placed in field boxes that are marked to show the Sanidad Vegetal orchard registration number. When full, these field boxes must be stored in an insect proof area until moved.

2.11 Any orchard who knowingly violates the stipulations outlined in this section will automatically lose its export certification.

3. Transportation of the Harvested Fruit from the Orchard to the Packinghouse

3.1 If not otherwise safeguarded, the avocados must be moved from the orchard to the packinghouse in a fruit fly proof conveyance within three hours after harvest. Each shipment will be accompanied by a log book indicating that the avocados originated in a certified orchard. The fruit may not be shipped loose or in bags.

4. Packing Houses

2.8 Si un barrenador de las ramas (*Copturus aguacatae*) es detectado en una propiedad contigua a un huerto certificado, de inmediato comenzarán las aplicaciones de insecticidas recomendadas por DGSV en la propiedad infestada. El huerto certificado contiguo al huerto infestado, será muestreado inmediatamente, y se muestreará semanalmente en lo sucesivo para asegurar la ausencia del barrenador de las ramas. El muestreo semanal se concentrará en los árboles más cercanos a la línea que delimita el huerto certificado y la propiedad infestada y consistirá en muestreo del follaje e inspecciones visuales a las ramas para detectar larvas o pupas.

2.9 Los productores que estén certificados y que participan en el programa deberán levantar todos los frutos caídos antes del 24 de octubre y después cada siete días. Además, las ramas secas deben ser podadas y sacadas del huerto periódicamente.

2.10 Los aguacates cosechados deben ser colocados en cajas de campo, identificadas con el número de registro del huerto de Sanidad Vegetal. Cuando estén llenas las cajas de campo deben almacenarse en un área a prueba de insectos mientras no se transporten a la empacadora.

2.11 Cualquier huerto que a sabiendas viole estas especificaciones perderá automáticamente su certificación para exportar.

3. El transporte de aguacate cosechado del huerto a la empacadora

3.1 Si no tienen otro tipo de protección, los aguacates deben ser llevados del huerto a la empacadora en un medio de transporte a prueba de moscas de la fruta dentro de las tres siguientes a la cosechados. Cada envío estará acompañado por una bitácora que indique que los aguacates se originaron en un huerto certificado. No se permitirá el envío de aguacates sueltos o en bolsas.

4. Las empacadoras

4.1 All packinghouses that export avocados to the United States must be registered with PSV and certified by DGSV on or before July 1 and listed in this work plan. PSV will verify that they are truly complying with all the specifications before issuing approval for certification.

4.2 The packing houses that are registered and certified will receive fruit only from orchards that are registered with PSV and certified by DGSV during the time the packinghouse is used to prepare avocados for export to the United States.

4.3 All openings to the outside of packinghouses participating in this program must be covered by screening with openings of not more than 1.6 mm or by some other barrier that prevents insects from entering. The packinghouse must have double doors at the entrance to the facility and at the interior entrance to the area where the avocados are packed. An enclosed area (space, room, etc.) separated from the packing area and equipped with double doors, and protective screens is also acceptable. Any damage to the screen or wall must be repaired.

4.4 Prior to the culling process, DGSV personnel will select 300 fruits from each shipment that arrives at the packinghouse. They will cut each fruit into slices inspecting for fruit flies, seed pests and stem weevils. The sample will target over-ripe and damaged fruit. In this case a shipment is defined as a field truck with fruit from one or more certified orchards presented for inspection at the packinghouse.

4.5 If a target pest is detected, the shipment will be rejected for export to the United States. DGSV will give PSV the data regarding the infested orchard. PSV will inform the grower of the pest control actions that are required in accordance with this work plan.

4.6 The identity of the avocados must be maintained from field boxes until they reach the U.S. to insure that any infested fruit can be traced to the orchard of origin.

4.1 Todas las empacadoras que exportan aguacate a los Estados Unidos deben estar registradas con el PSV y certificadas por la DGSV antes del 1 de julio, y estar enlistadas en este plan de trabajo. El PSV verificará que realmente cumplan con todas las especificaciones antes de otorgar la aprobación para certificación.

4.2 Las empacadoras registradas y certificadas únicamente recibirán frutos de huertos registrados con el PSV y certificados por la DGSV durante el tiempo en que se esté utilizando la empacadora para acondicionar aguacate para exportación a los Estados Unidos.

4.3 Toda abertura al exterior de las empacadoras que participan en este programa deberá estar cubierta con tela de malla de no más de 1.6 mm, o alguna otra barrera que impida la entrada de insectos. La empacadora debe tener dobles puertas en la entrada de la instalación y en la entrada interior al área en donde se empaacan los aguacates. También es aceptable un área cerrada (espacio, cuarto, etc.) separada del área de empaque y equipada con puertas dobles y tela de malla protectora. Debe repararse cualquier daño a las telas de malla protectora o paredes.

4.4 Antes del proceso de selección, el personal de la DGSV tomará 300 aguacates de cada cargamento que llegue a la empacadora y cortará cada uno en rebanadas para buscar moscas de la fruta, plagas del hueso y barrenadores de las ramas. En la muestra se buscarán aguacates pasados de maduros y dañados. Para este caso, embarque se define como, un camión de campo con fruta de una o más huertas certificadas y presentado en la empacadora para su inspección.

4.5 Si se detecta una plaga cuarentenaria, el cargamento será rechazado para su exportación a los Estados Unidos. La DGSV le dará al PSV los datos sobre el huerto infestado. El PSV informará al productor de las medidas de control de plagas que se requieran de acuerdo al plan de trabajo.

4.6 Debe mantenerse la identidad de los aguacates desde la caja de campo hasta que lleguen a los Estados Unidos, para tener la seguridad de poder rastrear hasta su huerto de origen cualquier aguacate infestado.

4.7 Prior to being packed in boxes, each avocados fruit must be cleaned of stems, leaves, and other portions of plants. Also each fruit must be labeled with a sticker that bears the DGSV registration number of the packinghouse.

4.8 The avocados must be packed in clean, new boxes. The boxes must be clearly marked with the identity of the grower, packinghouse, exporter, and the statement "Distribution or sale is prohibited outside of and limited to the following States: CT, DC, DE, IL, IN, KY, ME, MD, MA, ML NH, NJ, NY, OH, PA, RI, VA, VT, WV and WI". This information will be legible.

4.9 The boxes must be placed in a refrigerated truck or refrigerated container and remain in that truck or container while in transit through Mexico to the port of first arrival in the United States. Prior to leaving the packinghouse, the truck or container must be secured by DGSV with a seal that will not be broken until it reaches the port of first arrival in the United States.

4.10 Any avocados that have not been packed or loaded into a refrigerated truck or refrigerated container by the end of the work day must be kept in the screened fruit fly proof packing area.

4.11 When the fruit cannot be shipped immediately to the point of entry in the United States, it must be kept in quarantine secure areas of the packinghouse, under the supervision of PSV personnel to insure that the fruit will not be mixed with other uncertified avocados.

4.12 The areas that are adjacent to the packinghouse must be free of culled and cut fruit. Containers with culled and cut fruit must be emptied every day.

4.13 DGSV will notify APHIS of any incident that violates packing house procedures.

4.7 Antes de que sean empacados los aguacates, cada uno debe estar limpio de tallos, hojas y cualquier otro material de plantas. También cada fruto deberá llevar una etiqueta con el número de registro de la empacadora ante DGSV.

4.8 Los aguacates deben ser empacados en cajas nuevas y limpias, que deben estar claramente marcadas con la identidad del producto, la empacadora, el exportador y la frase "Su distribución o venta está prohibida fuera de y limitada a los siguientes estados: CT, DC, DE, IL, IN, KY, ME, MD, MA, MI, NH, NJ, NY, OH, PA, RI, VA, VT, WV y WI". Esta información deberá ser legible.

4.9 Las cajas deben colocarse en un camión o contenedor refrigerado y deben permanecer en dicho camión o contenedor mientras transita por México hasta el primer puerto de entrada en los Estados Unidos. Antes de salir de la empacadora, el camión o contenedor debe ser sellado por la DGSV con un sello que no se romperá sino hasta llegar al primer puerto de entrada en los Estados Unidos.

4.10 Todos los aguacates que no hayan sido empacados o cargados en un camión o contenedor refrigerado al final de la jornada deberán conservarse en el área de empacado que se encuentre protegida con malla a prueba de moscas.

4.11 Cuando no se pueda enviar inmediatamente el aguacate a su punto de entrada a los Estados Unidos deberá conservarse en el área encerrada con tela de malla de la empacadora, en áreas previamente asignadas y bajo la supervisión del personal del PSV para asegurar que no se mezclen con los otros aguacates.

4.12 Las áreas adyacentes a la empacadora deben estar libres de aguacates de desecho y cortados. Los contenedores con aguacates de desecho y cortados deberán ser vaciados todos los días.

4.13 La DGSV informará a APHIS de cualquier incidente que viole los procedimientos de la empacadora.

4.14 Willful noncompliance with the regulations outlined in this work plan will result in the elimination of the packinghouse's export certification for the remainder of the shipping season.

5. Phytosanitary Inspection Procedures

5.1 PSV personnel will verify that the boxes that contain avocados for export are identified with the name, address and registration number of the packing company as well as the registration number of the orchard.

5.2 PSV personnel will verify the compliance with the fruit packing requirement.

5.3 Avocado shipments may be palletized under the supervision of PSV for future movement if inspection for seed pests, stem weevils, and fruit flies reveal negative results.

5.4 Before shipment, PSV will verify that the vehicle in which the fruit will be transported has refrigeration, is clean and closed upon arrival at the packinghouse.

5.5 All shipments of avocados must be accompanied by a phytosanitary certificate issued by PSV certifying that the conditions of this work plan have been met. An additional declaration will state that all the conditions of 7 CFR 319.56-2ff have been met.

5.6 PSV will supervise that the packinghouse assigns a fixed seal to the conveyance. This seal will not be broken until the vehicle reaches the port of arrival in the United States. If the seal is broken en route to the United States for official reasons, it will be noted on the driver's documentation by the Mexican official who broke the seal.

4.14 El incumplimiento deliberado de los reglamentos enunciados en este plan de trabajo causará la eliminación de la certificación para exportar de la empacadora durante el resto de la temporada de exportación.

5. Procedimientos de inspección fitosanitaria

5.1 El personal del PSV verificará que las cajas con aguacate para exportación estén identificadas con el nombre, la dirección y el número de registro de la empacadora, así como el número de registro del huerto.

5.2 El personal del PSV verificará el cumplimiento de los requisitos de empaque del aguacate.

5.3 Los cargamentos de aguacate pueden ser colocados en pallets bajo la supervisión del PSV para movimientos futuros, si la inspección de plagas del hueso, barrenadores de las ramas y moscas de la fruta arroja resultados negativos.

5.4 Antes de enviar los cargamentos, el PSV verificará que el vehículo en el que se transporte el aguacate esté refrigerado, limpio y cerrado al llegar a la empacadora.

5.5 Todos los cargamentos de aguacate deben ir acompañados de un certificado fitosanitario expedido por el PSV, certificando que se han cumplido con las condiciones de este plan de trabajo. En una declaración adicional se atestiguará que se han cumplido todas las condiciones de 7 CFTR 319.56-2ff.

5.6 El PSV supervisará que la empacadora aplique un sello al medio de transporte. Este sello no será abierto hasta que el vehículo llegue al puerto de entrada en los Estados Unidos. Si el sello tuviera que ser abierto en el camino por motivos oficiales, el funcionario mexicano que haya abierto el sello lo anotará en la bitácora del conductor del vehículo.

5.7 If PSV discovers the stem weevil (*Copturus aguacatae*) with fruit at a packinghouse, PSV/DGSV must investigate the origin of the infested fruit and provide APHIS with information regarding the circumstances of the infestation and the pest risk mitigation measures taken. The orchard where the infested fruit originated will lose its export certification immediately and will be denied export certification for the entire shipping season of November through February.

5.8 If there is a lack of compliance with the conditions of selection, packing, transportation, and documentation, the shipment will be rejected and if this happens a second time, the packing company will lose its registration and certification until an investigation is done by DGSV and APHIS to determine if the packinghouse can continue to comply with the requirements of the work plan.

6. Transportation to the Border

6.1 The internal Mexican quarantine road stations maintain the right to verify the phytosanitary documentation of the shipment. However, they will not be able to carry out any action that will change the content of the shipment or the integrity of the certified pallets of avocados.

6.2 The shipment may enter the United States at any port located in the Northeastern States specified in the introduction of this work plan. Other ports authorized for entry and eventual transshipment are: Nogales, AZ, Galveston, Houston, Brownsville, Eagle Pass, El Paso, Hidalgo, and Laredo, TX.

7. Plant Quarantine Inspection in the United States.

7.1 The avocados are subject to inspection by an APHIS inspector at the port of first arrival, at any stops in the United States in route to the Northeastern States, and upon arrival at the terminal market in the Northeastern States.

5.7 Si el PSV descubre al barrenador de las ramas *Copturus aguacatae* con aguacates en la empacadora, PSV/DGSV deberán investigar el origen del fruto infestado e informar a APHIS de las circunstancias de la infestación y las medidas de mitigación de riesgos de plagas tomadas. El huerto de origen del fruto infestado inmediatamente perderá su certificación para exportar, y se le negará la certificación durante todo el ciclo de exportación, de noviembre hasta febrero, inclusive.

5.8 Si no se cumplen las condiciones de selección, empaque, transporte y documentación se rechazará el lote para exportación y si se repitiera por segunda vez, la empacadora perderá su registro y certificación hasta que DGSV y APHIS investiguen y determinen si la empacadora puede seguir cumpliendo con los requisitos del plan de trabajo.

6. Transporte hasta la frontera

6.1 Los puestos de cuarentena interna se reservan el derecho de verificar la documentación fitosanitaria del cargamento. Sin embargo, no podrán tomar ninguna medida que modifique el contenido del embarque o la integridad de los pallets de aguacate certificado.

6.2 El embarque podrá ingresar a los Estados Unidos por cualquier puerto en los estados del noreste especificados en la introducción de este plan de trabajo. Otros puertos autorizados para el ingreso y posible transbordo son: Nogales, AZ; Galveston, Houston, Brownsville, Eagle Pass, El Paso, Hidalgo y Laredo, TX.

7. Inspecciones de cuarentena vegetal en los Estados Unidos

7.1 Los aguacates serán inspeccionados por un inspector del PPQ en el puerto de entrada, en cualquier escala dentro de los Estados Unidos en camino a los estados del noreste, y al llegar al mercado final en dichos estados.

7.2 APHIS officials will verify that the documentation is correct, the fruit originated from the areas that are authorized to export avocados to the United States and the boxing and labeling requirements have been met.

7.3 The officer will examine 30 avocados selected from 30 boxes, choosing the fruits that appear most ripe. The exterior of each fruit will be examined and then cut into thin slices to inspect for seed pests, the stem weevil and fruit flies. After inspection the cut fruit will be disposed of in an appropriate manner.

7.4 If pests of quarantine importance are found upon inspection in the U.S., proper quarantine action will be recommended. If one of the seed pests, the stem weevil or a fruit fly is found during this inspection, the shipment will be rejected. APHIS will immediately inform DGSV of this fact and will provide the necessary information about the specific shipment. A complete investigation will be initiated and corrective actions will be taken in accordance with this work plan. If a second target larvae is detected from the same packing company, its authorization to export will be canceled until DGSV and APHIS have agreed upon the corrective measures necessary to renew the authorization.

8. Shipping Restrictions

7.2 Los funcionarios del PPQ verificarán que la documentación esté correcta, que los aguacates provengan de áreas autorizadas para exportación a los Estados Unidos y que se haya cumplido con los requisitos de empaçado en cajas y el etiquetado.

7.3 El funcionario examinará 30 aguacates seleccionados de 30 cajas, escogiendo los que parezcan más maduros. Se examinará primero el exterior de cada fruto, y después se cortarán en rebanadas delgadas para ver si hay plagas del hueso, barrenador de las ramas o moscas de la fruta. Después de dicha inspección se desechará la fruta cortada.

7.4 Si se encuentran plagas de importancia cuarentenaria al hacer la inspección en los Estados Unidos se recomendará la acción cuarentenaria que proceda. Si una de las plagas del hueso, barrenador de las ramas o mosca de la fruta se encuentran durante esta inspección se rechazará el cargamento. PPQ informará inmediatamente a la DGSV de este hecho y proporcionará la información necesaria acerca del cargamento específico. Se iniciará una investigación completa y se tomarán acciones correctivas. Si se detecta una segunda larva de la misma empacadora se cancelará su autorización para exportar hasta que la DGSV y APHIS hayan acordado las medidas necesarias para restablecer la autorización.

8. Restricciones para los envíos

8.1 Except as explained below in this paragraph for avocados that enter the United States at Nogales, AZ, avocados moved by truck or rail car may transit only that area of the United States bounded on the west by a line extending from El Paso, TX, to Denver, CO, and due north from Denver; and on the east and south by a line extending from Brownsville, TX, to Galveston, TX, to Kinder, LA, to Memphis, TN, to Knoxville, TN, following Interstate 40 to Raleigh, NC, and due east from Raleigh. All cities on these boundary lines are included in this area. If the avocados are moved by air, the aircraft may not land outside this area. Avocados that enter the United States at Nogales, AZ, must be moved to El Paso, TX, by the route specified on the permit, and then must remain within the shipping area described above in this paragraph.

8.2 The avocados must be moved through the United States either by air or in a refrigerated truck or refrigerated rail car. If the avocados enter the U.S. at the border, an inspector must seal the truck or rail car with a serially numbered seal at the port of first arrival in the United States. If the avocados are transferred to another vehicle or container in the United States, an APHIS inspector must be present to supervise the transfer and must apply a new serially numbered seal. The avocados must be moved through the United States under Customs bond.

9. Pest Identification

9.1 All suspect pests found in Mexico during the operational procedures of this work plan will be identified by DGSV in Michoacan with specimens immediately provided to APHIS for confirmation. If DGSV identifies the pest as a not quarantine pest, the orchard or packer may continue to export. In cases where APHIS identifies that same pest as a quarantine pest, export certification will be immediately suspended in according to procedures established in this work plan.

V. General Conditions

8.1 Salvo en el caso que se explica abajo, para aguacates que entren a los Estados Unidos por Nogales, Arizona; que se transporten por camión o carro de ferrocarril sólo podrán transitar en los Estados Unidos dentro de un área limitada al oeste por una línea trazada desde El Paso, Texas, hasta Denver, Colorado, y desde ahí hacia el norte; y al este y el sur por una línea desde Brownsville, Texas a Galveston, Texas, a Kinder, Louisiana, a Memphis, Tennessee, a Knoxville, Tennessee, a lo largo de la carretera interestatal 40 hasta Raleigh, Carolina del Norte y de ahí hasta el este. Todas las ciudades sobre estas líneas quedan incluidas en esta área. Si se transportan los aguacates por aire, no se le permitirá a los aviones aterrizar fuera de esta área. Los aguacates que entran a los Estados Unidos por Nogales, Arizona deberán ser transportados hasta El Paso, Texas, por la ruta que se especifica en el permiso, y después deben quedarse dentro del área descrita anteriormente.

8.2 Los aguacates deben ser transportados en los Estados Unidos por avión, en camión o carro de ferrocarril refrigerados. Si entran a los Estados Unidos en la frontera, un inspector debe sellar el camión o carro de ferrocarril con un sello numerado en el puerto de entrada a los Estados Unidos. Si los aguacates se transbordan a otro vehículo o contenedor en los Estados Unidos, deberá hacerse en presencia de un inspector de APHIS, quien supervisará el transbordo y aplicará un nuevo sello numerado. Los aguacates deben transportarse dentro de los Estados Unidos bajo resguardo aduanal.

9. Identificación de plagas

9.1 Todas las plagas encontradas en México durante el proceso operativo de este plan de trabajo serán identificadas por la DGSV en Michoacán y se entregarán los especímenes inmediatamente a APHIS para su confirmación. Si la DGSV identifica la plaga como no cuarentenaria el huerto o empacadora continuará exportando. En caso de que APHIS identifique la misma plaga como cuarentenaria, se suspenderá la exportación de acuerdo a lo establecido en este plan de Trabajo.

V. Condiciones generales

1. Annual Inspection of the Operations

1.1 All actions carried out under this work plan will be reviewed and evaluated every year by DGSV and APHIS to insure that all the aspects of the operation are done in an efficient manner and according to the procedures and applicable regulations.

2. Work Plan

2.1 The procedures hereby established can be amended if agreed to mutually in writing by APHIS and DGSV.

2.2 When establishing a new orchard, municipality or packing company, DGSV will provide sufficient notice to APHIS before beginning exportations in order to conduct the required surveys. Information will be furnished that will verify the conditions of the certification issued by DGSV.

1. Inspección anual de las operaciones

1.1 Todas las acciones realizadas de acuerdo con este plan de trabajo serán revisadas y evaluadas cada año por la DGSV y PPQ para asegurar que se cumpla con todos los aspectos de la operación de manera eficiente, de acuerdo con los procedimientos y reglamentos aplicables.

2. Plan de trabajo

2.1 Los procedimientos establecidos en este plan pueden ser modificados si así lo acuerdan mutuamente por escrito APHIS y DGSV.

2.2 Al establecer un nuevo huerto, municipio o empacadora, la DGSV comunicará la certificación del mismo a APHIS con suficiente tiempo antes de iniciar la exportación, para que se realicen los muestreos requeridos. Se proporcionará información que verifique las condiciones de la certificación expedida por la DGSV.

APPENDIX INDEX

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Appendix A

List of proposed, approved Municipalities, Orchards
and Packinghouses

Apéndice A

Lista de municipios, huertos
y empacadoras propuestas y aprobadas

**Supporting Documentation
(SAGAR/DGSV Formats)**

**Documentación de Apoyo
(Formatos de SAGAR/DGSV)**

Appendix B

Seed Pest, Stem Weevil and Fruit Fly
Survey Information and Supporting
Documentation

Apéndice B

Plaga del hueso, barrenador de las ramas y moscas de
la fruta
Información de muestreo y documentación de apoyo

AVOCADO SAMPLING TO INSPECT FOR SEED PESTS AND STEM WEEVILS

Objective

This section describes the sampling procedures required to detect possible specimens of avocado seed pests (*Conotrachelus aguacatae*, *Conotrachelus perseae*, *Heilipus lauri*, and *Stenoma catenifer*) and the stem weevil (*Copturus aguacatae*) in orchards that have been selected for the exportation of fruit to the United States of America.

Sampling

1. Sampling to detect avocado seed pests.

A. Commercial orchards

This action makes it possible to detect any biological instar of seed pests and must take into account the Hass cultivar phenology, the pest's biological cycle and the specific ecological conditions of each producing area.

The areas to be sampled in each orchard are distributed at random. Foliage is sampled to detect adults, and the fruit for larvae and eggs.

_ Foliage Sampling

Foliage will be sampled to detect adult avocado seed weevils. Ten trees per hectare are taken, equal to 4 trees per acre (0.4 ha). A branch with abundant growth of leaves is selected, at an average height of 1.65m. A 1.62 m (18 sq.ft) square of fabric is placed under the branch, which is then shaken vigorously to knock off the insects. This should be done early in the morning.

MUESTREO DE AGUACATES PARA DETECTAR PLAGAS DEL HUESO Y BARRENADORES DE LAS RAMAS.

Objetivo

En esta sección se describen los procedimientos de muestreo requeridos para detectar posibles ejemplares de plagas del hueso de aguacate (*Conotrachelus aguacatae*, *Conotrachelus perseae*, *Heilipus lauri* y *Stenoma catenifer*) y el barrenador de las ramas (*Copturus aguacatae*) en huertos seleccionados para exportar aguacate a los Estados Unidos.

Muestreo

1. Muestreo para detectar plagas del hueso de aguacate.

A. Huertos comerciales

Esta acción permite detectar cualquier estadio biológico de las plagas del hueso y debe tomar en cuenta la fonología del cultivar Hass, el ciclo biológico de la plaga y las condiciones ecológicas específicas de cada área de producción.

Las áreas que se deben muestrear en cada huerto se distribuyen al azar. Se muestrea el follaje para detectar adultos, y los frutos para detectar larvas y huevecillos.

_ Muestreo del follaje

Se muestreará el follaje para detectar barrenadores del hueso adultos. Se tomarán diez árboles por hectárea, igual a 4 árboles por acre (0.4 hectáreas). Se selecciona una rama con abundantes hojas a una altura promedio de 1.65 m. Se coloca un cuadro de tela de 1.62 m (18 pies cuadrados) bajo la rama, que se sacude energicamente para que se caigan los insectos. Esto debe hacerse temprano en la mañana.

– Fruit Sampling in the Field

A. From 25 trees per hectare 10 fruits will be taken per each tree with at least 50% from the ground. All the fruit will be cut open to detect the presence of weevil eggs or larvae.

B. Avocado trees from non export orchards will be sampled and surveyed in the manner described above.

C. The wild and backyard avocado trees will be sampled at least 50 trees per municipality.

2. Sampling to Detect Stem weevils *Copturus aguacatae*

Samples are taken from foliage to detect adults and from the branches to detect larvae and pupae.

– Branch Sampling

Visual inspection is performed in a figure eight pattern where the figure eight is as large as the orchard. Also, the adjacent properties that border the export certified orchard will be surveyed. If symptoms are found the branch will be cut open and inspected for larva and pupae.

FRUIT FLY MONITORING

Objetivo

In order to identify fruit fly population levels, and if required, to take timely action to keep such populations at low prevalence levels in the designated municipalities, the following actions should be taken in every orchard registered by DGSV to produce Hass avocados for exportation to the United States.

– Muestreo de frutos en el campo

A. De 25 árboles de cada hectárea se tomarán 10 frutos por cada árbol, de los cuales al menos 50% serán de los que han caído al suelo. Se abrirán todos para buscar la presencia de huevecillos o larvas de barrenadores.

B. Los árboles de aguacate de huertos que no son para exportación se muestrearán de la forma descrita anteriormente.

C. Los arboles silvestres o de traspatio se muestrearán al menos 50 arboles por municipio.

2. Muestreo para encontrar barrenadores de las ramas *Copturus aguacatae*.

Para detectar adultos se toman muestras del follaje y de las ramas para detectar larvas y pupas.

– Muestreo de ramas

Se realizará una inspección visual utilizando un patrón como de un ocho, donde este ocho es del tamaño del huerto. Las propiedades adyacentes al huerto certificado para exportación también serán muestreadas. Si se encuentran síntomas, la rama se cortará, se abrirá e inspeccionará buscando larvas y pupas.

MONITOREO DE MOSCAS DE LA FRUTA

Objetivo

Con el fin de identificar el nivel de población de moscas de la fruta, y en caso necesario, actuar oportunamente para mantener dichas poblaciones en un nivel de baja prevalencia en los municipios designados, se deberán tomar las siguientes acciones en todos los huertos registrados por la DGSV para producir aguacate Hass para exportación a los Estados Unidos.

Trapping for *Anastrepha* spp.

1. McPhail traps should be kept in place and inspected every 7 days, in order to detect fruit flies.
2. Traps will be baited as follows: If liquid protein is used, the following mixture shall be placed in each:
 - 10 ml of liquid hydrolyzed protein
 - 3 g of Borax
 - 240 ml of water

If solid torula yeast is employed, 4 to 5 yeast tablets and 240 ml of water should be placed in each trap.

3. One trap should be placed for each 10 hectares, evenly distributed. In orchards smaller than 10 hectares and up to 20 hectares, the minimum density shall be 2 traps.
4. Each trap should be placed so as to have at least a 120 meter detection zone around it. All sites where traps are placed must be mapped and identified with a location number. Specimens detected are to be identified with the date and trap location.

Trapping for Medfly

Mexico is recognized as free of Medfly but has a contiguous land border with Guatemala. Therefore, precautionary trapping is required.

Trampero para *Anastrepha* spp.

1. Se deberán instalar trampas McPhail que serán inspeccionadas cada 7 días, con el fin de detectar moscas de la fruta.
2. Las trampas tendrán el siguiente cebo: Si se usa proteína líquida se deberá colocar la siguiente mezcla en cada trampa:
 - 10 ml de proteína hidrolizada líquida
 - 3 g de bórax
 - 240 ml de agua

En caso de usar levadura torula sólida, deben ponerse de 4 a 5 tabletas de levadura y 240 ml de agua en cada trampa.

3. Debe colocarse una trampa por cada 10 hectáreas, distribuidas uniformemente. En huertas de menos de 10 hectáreas y hasta de 20 hectáreas, la densidad mínima debe ser de 2 trampas.
4. Deben colocarse todas las trampas de manera que cada una tenga una zona de detección a su alrededor de por lo menos 120 metros. Todos los sitios en donde se coloquen trampas deben figurar en un mapa y estar identificados con un número de ubicación. Los ejemplares detectados deben identificarse con la fecha y ubicación de las trampas.

Trampero para mosca del Mediterráneo

Se reconoce a México como libre de Mosca mediterránea, pero tiene frontera con Guatemala. Por lo anterior, se requiere un trampero preventivo.

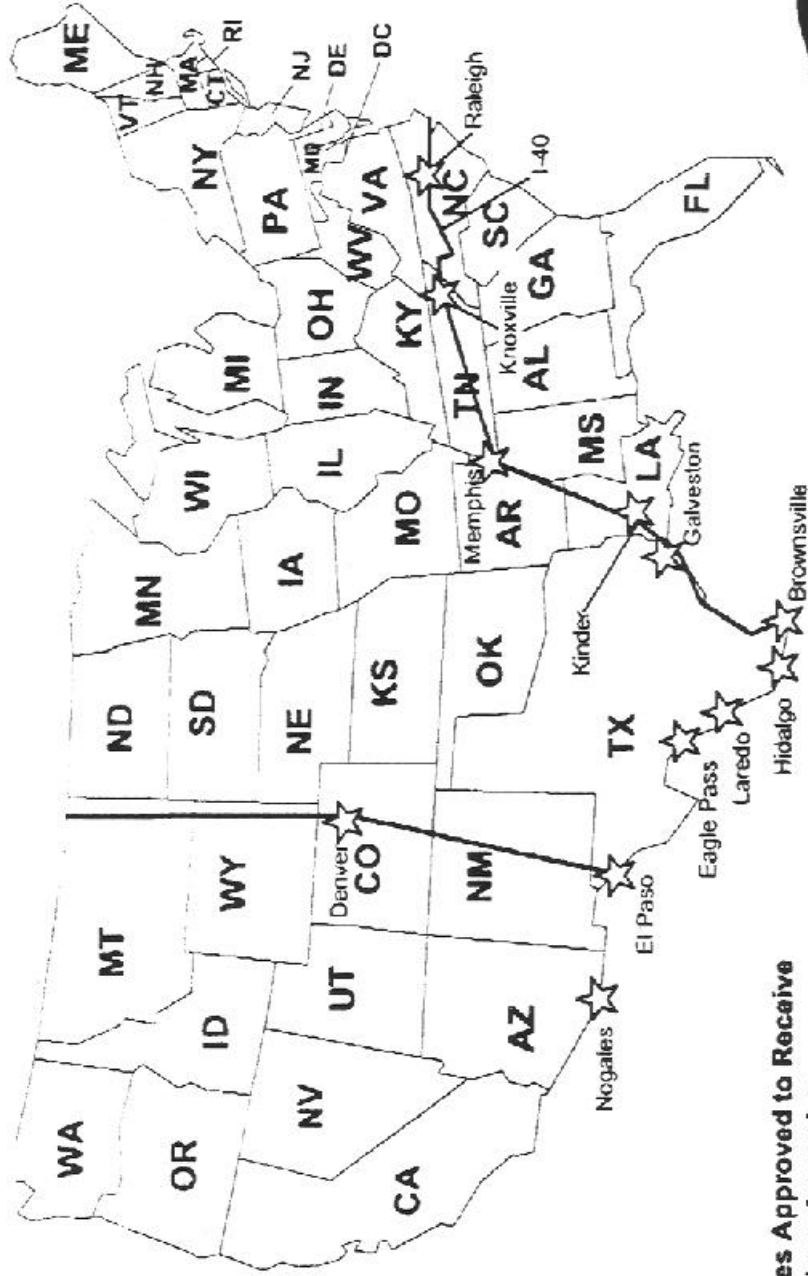
1. Jackson traps will be used with Trimedlure (tml) using either a solid plug lure containing 2 to 4 gms. of TML in a plastic cage suspended from the inside of the trap or a liquid lure with 2 to 4 ml. liquid TML on a cotton wick supported inside the trap by a wire wick holder. The trap density should be one trap per 1 to 4 square miles and they should be inspected and serviced once every 2 weeks. The traps will be set and maintained according to the Mexican National Trapping program.

1. Se usarán trampas Jackson con Trimedlure (TML) usando el atrayente sólido con 2 a 4 gramos de TML contenido en un recipiente de plástico que será suspendido dentro de la trampa o el atrayente líquido con 2 a 4 ml. de TML líquido colocado en un trozo de algodón sostenido por un alambre en el interior de la trampa. La densidad del trampeo será de una trampa cada 1 a 4 millas cuadradas, se inspeccionarán y dará servicio cada 2 semanas. Las trampas se colocarán y mantendrán de acuerdo al Programa Nacional de Trampeo de México.

Appendix C
Mexican Avocado Transit and Distribution Map

Apéndice C
Ruta para transitar el Aguacate Mexicano y Mapa de
Distribución

Mexican Avocado Transit and Distribution Areas



States Approved to Receive Mexican Avocados

Approved Transit Corridor for Mexican Avocados



Appendix D: Pest surveillance results for surveys performed in Mexico from 1997 until 2000.

FOLIAGE SURVEY 1997

MUNICIPALITY	NUMBER OF HECTARES SURVEYED	NUMBER OF ORCHARDS SURVEYED	NUMBER OF ORCHARDS POSITIVES FOR <i>Copturus aguacatae</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Stenoma catenifer</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Conotrachelus perseae</i>
PERIBAN	3,328	422	163	0	0	0	0
S. ESCALANTE	1,661	175	24	0	0	0	0
TANCITARO	2,428	221	0	0	0	0	0
URUAPAN	3,755	187	57	0	0	0	0
TOTAL	11,172	1,005	244	0	0	0	0

FOLIAGE SURVEY 1998

MUNICIPALITY	NUMBER OF HECTARES SURVEYED	NUMBER OF ORCHARDS SURVEYED	NUMBER OF ORCHARDS POSITIVES FOR <i>Copturus aguacatae</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Stenoma catenifer</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Conotrachelus perseae</i>
PERIBAN	4,394	801	474	0	0	0	0
S. ESCALANTE	2,490	345	46	0	0	0	0
TANCITARO	2,090	295	0	0	0	0	0
URUAPAN	6,903	646	413	0	0	0	0
TOTAL	15,877	2,087	933	0	0	0	0

FOLIAGE SURVEY 1999

MUNICIPALITY	NUMBER OF HECTARES SURVEYED	NUMBER OF ORCHARDS SURVEYED	NUMBER OF ORCHARDS POSITIVES FOR <i>Copturus aguacatae</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Stenoma catenifer</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Conotrachelus perseae</i>
PERIBAN	2,887.51	540	93	0	0	0	0
S. ESCALANTE	2,800.3	331	62	0	0	0	0
TANCITARO	5,552.39	743	17	0	0	0	0
URUAPAN	2,341.63	545	135	0	0	0	0
TOTAL	13,581.83	2,159	307	0	0	0	0

FOLIAGE SURVEY 2000

MUNICIPALITY	NUMBER OF HECTARES SURVEYED	NUMBER OF ORCHARDS SURVEYED	NUMBER OF ORCHARDS POSITIVES FOR <i>Copturus aguacatae</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Stenoma catentifer</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF ORCHARDS POSITIVE FOR <i>Conotrachelus perseae</i>
SAN JUAN NUEVO	1,381.5	144	17	0	0	0	0
PERIBAN	3,042.19	592	175	0	0	0	0
S. ESCALANTE	2,723.30	305	58	0	0	0	0
TANCITARO	9,080.2	1,237	44	0	0	0	0
URUAPAN	1,734.77	307	32	0	0	0	0
TOTAL	17,961.96	2,585	326	0	0	0	0

WILD & BACKYARD TREE SURVEY 1997

MUNICIPALITY	NUMBER OF SITES	NUMBER OF SITES POSITIVE FOR <i>Copturus aguacatae</i>	NUMBER OF SITES POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF SITES POSITIVE FOR <i>Stenoma catenifer</i>	NUMBER OF SITES POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF SITES POSITIVE FOR <i>Conotrachelus perseae</i>
PERIBAN	14	0	0	0	0	0
S. ESCALANTE	46	0	0	0	0	0
TANCITARO	17	0	0	0	0	0
URUAPAN	23	0	0	0	0	0
TOTAL	100	0	0	0	0	0

WILD & BACKYARD TREE SURVEY 1998

MUNICIPALITY	NUMBER OF SITES	NUMBER OF SITES POSITIVE FOR <i>Copturus aguacatae</i>	NUMBER OF SITES POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF SITES POSITIVE FOR <i>Stenoma catenifer</i>	NUMBER OF SITES POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF SITES POSITIVE FOR <i>Conotrachelus perseae</i>
PERIBAN	30	0	0	0	0	0
S. ESCALANTE	22	0	0	0	0	0
TANCITARO	42	1	0	0	0	0
URUAPAN	26	5	0	0	0	0
TOTAL	120	6	0	0	0	0

WILD & BACKYARD TREE SURVEY 1999

MUNICIPALITY	NUMBER OF SITES	NUMBER OF SITES POSITIVE FOR <i>Copturus aguacatae</i>	NUMBER OF SITES POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF SITES POSITIVE FOR <i>Stenoma catenifer</i>	NUMBER OF SITES POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF SITES POSITIVE FOR <i>Conotrachelus perseae</i>
PERIBAN	56	2	0	0	0	0
S. ESCALANTE	124	1	0	0	0	0
TANCITARO	69	5	0	0	0	0
URUAPAN	102	7	0	0	0	0
TOTAL	351	15	0	0	0	0

WILD & BACKYARD TREE SURVEY 2000

MUNICIPALITY	NUMBER OF SITES	NUMBER OF SITES POSITIVE FOR <i>Coptures aguacatae</i>	NUMBER OF SITES POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF SITES POSITIVE FOR <i>Stenoma catenifer</i>	NUMBER OF SITES POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF SITES POSITIVE FOR <i>Conotrachelus perseae</i>
SAN JUAN NUEVO	91	19	0	0	0	0
PERIBAN	60	51	0	0	0	0
S. ESCALANTE	85	5	0	0	0	0
TANCITARO	186	41	0	0	0	0
URUAPAN	189	173	0	0	0	0
TOTAL	611	289	0	0	0	0

FRUIT CUTTING SURVEY IN ORCHARDS 1997

MUNICIPALITY	NUMBER OF FRUIT CUT	NUMBER OF FRUIT POSITIVE FOR <i>Copturus aguacatae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF FRUIT POSITIVE FOR <i>Stenoma catenifer</i>	NUMBER OF FRUIT POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Conotrachelus perseae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Anastrepha Spp.</i>
PERIBAN	449,140	0	0	0	0	0	0
S. ESCALANTE	94,315	0	0	0	0	0	0
TANCITARO	242,850	0	0	0	0	0	0
URUAPAN	369,000	0	0	0	0	0	0
TOTAL	1,155,305	0	0	0	0	0	0

FRUIT CUTTING SURVEY IN ORCHARDS 1998

MUNICIPALITY	NUMBER OF FRUIT CUT	NUMBER OF FRUIT POSITIVE FOR <i>Copturus aguacatae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF FRUIT POSITIVE FOR <i>Stenoma catenifer</i>	NUMBER OF FRUIT POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Conotrachelus perseae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Anastrepha Spp.</i>
PERIBAN	439,362	0	0	0	0	0	0
S. ESCALANTE	90,819	0	0	0	0	0	0
TANCITARO	209,040	0	0	0	0	0	0
URUAPAN	382,250	0	0	0	0	0	0
TOTAL	1,121,471	0	0	0	0	0	0

FRUIT CUTTING SURVEY IN ORCHARDS 1999

MUNICIPALITY	NUMBER OF FRUIT CUT	NUMBER OF FRUIT POSITIVE FOR <i>Copturus aguacatae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF FRUIT POSITIVE FOR <i>Stenoma catenifer</i>	NUMBER OF FRUIT POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Conotrachelus perseae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Anastrepha Spp.</i>
PERIBAN	28,876	0	0	0	0	0	0
S. ESCALANTE	144,066	0	0	0	0	0	0
TANCITARO	555,239	0	0	0	0	0	0
URUAPAN	224,242	0	0	0	0	0	0
TOTAL	952,423	0	0	0	0	0	0

FRUIT CUTTING SURVEY IN ORCHARDS 2000

MUNICIPALITY	NUMBER OF FRUIT CUT	NUMBER OF FRUIT POSITIVE FOR <i>Copturus aguacatae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Heilipus lauri</i>	NUMBER OF FRUIT POSITIVE FOR <i>Stenoma catenifer</i>	NUMBER OF FRUIT POSITIVE FOR <i>Conotrachelus aguacatae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Conotrachelus perseae</i>	NUMBER OF FRUIT POSITIVE FOR <i>Anastrepha Spp.</i>
SAN JUAN NUEVO	196,815	0	0	0	0	0	0
PERIBAN	97,308	0	0	0	0	0	0
S. ESCALANTE	242,497	0	0	0	0	0	0
TANCITARO	417,086	0	0	0	0	0	0
URUAPAN	256,108	0	0	0	0	0	0
TOTAL	1,209,814	0	0	0	0	0	0

TRAPPING DATA
CAPTURES IN ORCHARDS CERTIFIED FOR EXPORTS TO THE U.S.
CALENDAR YEAR 1997

MONTH	PERIBAN			SALVADOR ESCALANTE			TANCITARO			URUAPAN		
	ANASTREPHA			ANASTREPHA			ANASTREPHA			ANASTREPHA		
	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>
JANUARY												
FEBRUARY												
MARCH												
APRIL												
MAY	1			2			21	1		2		
JUNE	1	1		1			11			1		
JULY				3	1		24	1		2		
AUGUST	3			3	1		4	2				
SEPTEMBER	3			3			14					
OCTOBER				1			7					
NOVEMBER												
DECEMBER												
TOTAL	8	1		13	2		81	4		5		

**TRAPPING DATA
CAPTURES IN ORCHARDS CERTIFIED FOR EXPORTS TO THE U.S.
CALENDAR YEAR 1998**

MONTH	PERIBAN			SALVADOR ESCALANTE			TANCITARO			URUAPAN		
	ANASTREPHA			ANASTREPHA			ANASTREPHA			ANASTREPHA		
	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>
JANUARY												
FEBRUARY												
MARCH												
APRIL												
MAY	1			3	1		22	2				
JUNE	1						14					
JULY	2			4	1		28	4				
AUGUST	1						21	2				
SEPTEMBER							34					
OCTOBER												
NOVEMBER							3					
DECEMBER												
TOTAL	5			7	2		122	8				

**TRAPPING DATA
CAPTURES IN ORCHARDS CERTIFIED FOR EXPORTS TO THE U.S.
CALENDAR YEAR 1999**

MONTH	PERIBAN			SALVADOR ESCALANTE			TANCITARO			URUAPAN		
	ANASTREPHA			ANASTREPHA			ANASTREPHA			ANASTREPHA		
	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>
JANUARY												
FEBRUARY												
MARCH												
APRIL												
MAY				5						7		
JUNE				7			13			2		
JULY				6			56			5		
AUGUST	4			20			51			2		
SEPTEMBER	2			13			6			5		
OCTOBER	1			7			17					
NOVEMBER												
DECEMBER												
TOTAL	7			58			143			21		

**TRAPPING DATA
CAPTURES IN ORCHARDS CERTIFIED FOR EXPORTS TO THE U.S.
CALENDAR YEAR 2000**

MONTH	PERIBAN			SALVADOR ESCALANTE			TANCITARO			URUAPAN			NUEVO PARANGURICUTIRO		
	ANASTREPHA			ANASTREPHA			ANASTREPHA			ANASTREPHA			ANASTREPHA		
	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>	<i>ludens</i>	<i>striata</i>	<i>serpentina</i>
JANUARY				4											
FEBRUARY				4											
MARCH				3											
APRIL				2											
MAY				1											
JUNE	1			3											
JULY				8											
AUGUST				4			89			20					
SEPTEMBER				12			25	1		12			1		
OCTOBER				1			17			4					
NOVEMBER															
DICEMBER															
TOTAL	1			42			131	1		36			1		

Appendix E:

SCIENTIFIC REPORT

Subject: *Stenomima catenifer* Walsingham as an Avocado pest in Michoacan, Mexico

Responsible: Dr. Luis M. Cervantes Peredo

This report is made after an inspection visit to different municipalities around Uruapan, Michoacan, Mexico in which Avocado Hass Orchards have been proposed for export to the United States of America. And after a meeting with USDA, CAC, APEAM and SAGAR officials in which different issues were discussed. The visit to the orchards took place during 19 and 20 of September and the meeting took place between 26 and 29 of September.

INTRODUCTION

The Stenomimid moth, *Stenomima catenifer* Walsingham has been reported several times as an important pest of avocado (*Persea americana* Mill.) in different countries in Latin America, including Brazil (Ventura, et al, 1999), Guatemala, Panama, Mexico (Walsingham, 1909-1915), Colombia, Ecuador, and Peru (Acevedo et al, 1972), Venezuela (Boscan & Godoy, 1982, 1984). For Mexico, *S. catenifer* has been reported for Llera de Canales, Tamaulipas (Muniz, 1958), Tlapacoyan y El Palmar, Veracruz (Acevedo et al, 1972) and for other states without specific location. For example, Colima (Acevedo et al, 1972), Guerrero (Garcia et al 1967), Oaxaca (Coronado, 1965, Garcia et al, 1967), Chiapas (Coronado, 1965, Garcia et al, 1967), Nuevo Leon (Garcia et al 1967), Tamaulipas (Coronado, 1965, Garcia et al, 1967), Veracruz (Muniz, 1958, Coronado, 1965, Garcia et al 1967), Michoacan (Deloya & Valenzuela, 1999).

The first records of *S. catenifer* were on avocado (*P. americana*), although it has been recorded also on other Lauraceae, Acevedo et al (1972) reported it for *Persea schiedeana* Nees and for *Beilschedia* sp; and Cervantes et al (1999) recorded it for *Chlorocardium rodiei* (Schomb.) Rohwer, Ritcher & van der Werff.

In very old literature this pest has been reported as big problem and that in some countries is the most important pest of avocado. There are just a few studies that showed real infestation levels. Acevedo et al (1972) recorded infestation levels between 4.2 and 52.2 percent for the varieties Broth and Choquette in Veracruz, Mexico. Boscan & Godoy (1982) in Venezuela reported 80 percent of infestation. Ventura et al (1999) showed that 28.4 and 72.1 of the cultivars Beatriz and Margarida respectively, were infested in Brazil. Cervantes et al (1999) studying *S. catenifer* on *Chlorocardium rodiei* determined that infestation levels are never higher than 10 percent.

The life cycle has been studied on avocado by Acevedo (1970) and Acevedo et al (1972). The life cycle on one of its natural hosts was studied by Cervantes et al (1999) and he concluded that there were almost no differences between the cycles on different hosts.

Although several authors have suggested the use of light traps to capture *S. catenifer*, the works of Acevedo et al (1972) and Cervantes et al (1999) showed that this trapping technique was not very successful and that the best way to detect the moth was by cutting open fruit (including pulp and seed) of different sizes and inspect the seed looking for larvae or its characteristic damage.

FIELD AND MEETING ACTIVITIES

During two days several orchards were visited, including some in Cherangueran, Tiamba, El Rosario, La Loma and Ziracuaretiro (this last one not included in the municipalities for export).

In the first four localities visits were made accompanied by a USDA inspector and several inspectors of Junta Local (SAGAR). Observations were made of the sampling techniques specified in the work plan for the detection of stem borers, seed moth, seed weevils and fruit flies. Inspectors of USDA and SAGAR did its systematic sampling and some personal observations were made.

During the field work around 10 proposed orchards for export were checked and at the same time, orchards and back yards around these export orchards were visited and avocado trees (even of different varieties) were checked.

Early in the morning (between 7:00 and 10:00) the sampling of the stem borer was done, according to the work plan. Later on the fruit was sampled, by checking around 750 fruit in all the orchards. At the same time MacFail traps were checked. Within the orchards some extra fruit found on the ground and mummified were cut searching for signs of the damage caused by the larvae. Soil was also search for pupa and to observe soil conditions.

On October 26, the meeting between USDA officials and representatives of CAC, APEAM and SAGAR was held in the USDA office in Uruapan, Michoacan. Different issues about the avocado pests, the techniques used for sampling and other problems in the avocado program were discussed. In the afternoon a check point of SAGAR (Tingambato) was visited. On October 27, an proposed orchard was visited (Tiamba area), so the officials were able to observe the orchards and the work done by USDA and SAGAR inspectors to certified the orchards for export. An orchard not included in the program in Ziracuaretiro was also visited because in this area the stem borer has been reported previously.

OBSERVATIONS

The methods use for detecting pests that have been proposed in the USDA-SAGAR work plan, if they are followed as are specified, are adequate to detect the presence of the seed moth. Sampling of the stem borer early in the morning will also disturb moths that could be resting under the leaves and branches of trees. During fruit sampling inspectors choose fruit from the ground and fruit from the tree in different stages of development warranting with this, that, if there is and infestation, it will be detected.

Sampling all year around will increase the chances of detection. Most studies have centred the sampling during the fruiting period, but it could be possible that the moth will move to different hosts if there are in the area, or to different trees with different phenology. It is common in Lauraceae to find trees with different stages of fruit development which can provide food for the larvae all year around. In one of its natural host *S. catenifer* (Cervantes et al, 1999) was found all year around.

Although has been suggested in the literature the use of black light, to trap the moths, two studies: Acevedo et al (1972) and Cervantes et al (1999) did not obtain good results with this method.

Sampling of the soil will be time consuming and (Cervantes, pers.obs) are difficult to see even when there are infested fruits with the exit hole on the ground.

The orchards authorised for export avocado are located between altitudes of 1600 to 2000 m. And the only precise localities in which *S. catenifer* has been found are all below an altitude of 1000m. So it is probable that this species will not occur above a 1000m and the orchards above this level will be free of this pest.

The natural hosts of *S. catenifer* are other Lauraceae in which the fruit lacks completely of pulp surrounding the seed or the amount of pulp is very low, compare with the seed. Avocado Hass, has more pulp compare with the size of the seed, so this could represent a barrier for the larvae to penetrate, and making the avocado Hass a no very good host.

During the meeting everybody gave their opinion and most of the questions were answered. The visits to the check point (Tingambato), export orchard (Tiamba) and no proposed orchard (Ziracuaretiro) showed some of the procedures involved in the avocado industry and that the orchards for export are in better conditions than the no export orchards. This include better car and that are usually located at higher altitudes, which could act as a barrier for several pest that could be present in more tropical environments. Either the meeting and the visits were made as open as possible, so there was no sign that any information was been kept secret.

SUGGESTIONS

- 1.- The techniques proposed in the work plan for sampling stem and seed borers and fruit fly must be follow precisely.
- 2.- When the fruit cutting (searching for pest) in the orchards is done, make sure that fruit of different sizes are chosen from fallen fruit and fruit from the tree.

3.- The use of trap lights will not be recommended until there is a study which certifies if the moth is attracted to light and to which wave length and during which time of the year the adults are active.

4.- Although it is clear that the moth do not occur in the orchards proposed for export it will be important to delimit its real distribution, which in the past was suggested as wide as Mexico, and, that this was a very important pest.

As been Michoacan the only State exporting avocado to the USA, it will be important to monitor this area first, but also planning a project to survey all areas in the country reported (very old literature) as been infested.

5.- After a proper study is made, many of the questions about this "important pest", will be answered and it will be clear to see if this pest still really a problem and if Avocado Hass can act as a host.

Dr. Luis Cervantes Peredo
Instituto de Ecología, A.C.
Departamento de Entomología
Apartado Postal 63
CP 91000
Xalapa, Veracruz
Mexico
tel (522) 8421800 ext 4202
fax (522) 8187809
e-mail cervantl@ecologia.edu.mx

References

- ACEVEDO, E. 1970. Estudios sobre el barrenador del hueso y pulpa del aguacate *Stenoma catenifer* Walsingham 1912 (Lepidoptera: Stenomidae). I Biología y Hábitos II Descripción Morfológica III Control Químico bajo condiciones de campo. Tesis Maestro en Ciencias ENA Colegio de Posgraduados, México.
- ACEVEDO, E., VÁZQUEZ, J. and SOSA, C. 1972. Estudios sobre el barrenador del hueso del aguacate *Stenoma catenifer* Walsingham (Lepidoptera: Stenomidae). Agrociencia 9: 17-24.
- BOSCÁN DE MARTÍNEZ, N. and GODOY, F.J. 1982. *Apanteles* sp. (Hymenoptera: Braconidae) parásito del taladrador del fruto del aguacate *Stenoma catenifer* Walsingham (Lepidoptera: Stenomidae) en Venezuela. *Agronomía Tropical* 32: 319-321.
- BOSCÁN DE MARTÍNEZ, N. and GODOY, F.J. 1984. Observaciones preliminares sobre la biología de *Stenoma catenifer* Walsingham (Lepidoptera: Stenomidae) taladrador del aguacate (*Persea americana* Mill.). *Agronomía Tropical* 34:205-208.
- CERVANTES, P.L., LYAL, C.H. and BROWN, V.K. 1999. The stenomine moth, *Stenoma catenifer* Walsingham: a pre-dispersal seed predator of Greenheart (*Chlorocardium rodiei* (Schomb.) Rohwer, Ritcher & van der Werff) in Guyana. *Journal of Natural History* 33: 531-542.
- CORONADO, P.R. 1965. *Apuntes de Entomología Agrícola*. Chapingo, México. Escuela Nacional de Agricultura. 213 pp.
- DELOYA, A.C. and VALENZUELA, G.J.E. 1999. *Catálogo de Insectos y Ácaros Plaga de los Cultivos Agrícolas de México*. Sociedad Mexicana de Entomología. México. page 91.
- GARCÍA, A., VILLA, M.M. and GUTIÉRREZ, A.M. 1967. El aguacate: plagas y enfermedades. *Fitofilo* 20: 5-30.

MUÑÍZ, V.R. 1958. La oruga barrenadora del hueso del aguacate, *Stenoma catenifer* Walsingham (Lepidoptera: Stenomidae). *Congreso Nacional de Entomología y Fitopatología. I Chapingo, México.* pp 170-174.

VENTURA, M.U., DESTRO, D., LOPES, E.C.A. and MONTALVAN, R. 1999. Avocado moth (Lepidoptera: Stenomidae) damage in two avocado cultivars. *Florida Entomologist* 82(4): 625-631.

WALSINGHAM, L. 1909-1915. Tineina, Pterophorina, Orneodina, Pyralidina and Hepialina (part) *Biologia Centrali Americana Zoology Lepidoptera-Heterocera, IV.* pp. 168-169.

Appendix F:

Analysis of survey methods for avocado seed moth, stem weevil and seed weevils

APHIS reviewed survey methods for the the avocado seed moth, *Stenoma catenifer* (Lepidoptera: Elachistidae: Stenominae), the stem weevil *Copturus agucate* and seed weevils *Conotrachelus perseae*, *C. agucate*, and *Heilipus lauri* (Coleoptera: Curculionidae).

Avocado seed moth. In their letter of July 18, 2000, the California Avocado Commission (Appendix) had particular concerns with APHIS survey techniques for the avocado seed moth, noting that (1) adult seed moths are active before APHIS personnel become directly involved in orchard surveys in July and (2) APHIS does not use black light traps as detection tools as recommended in some of the literature (USDA 1980). APHIS believed that the extensive fruit cutting requirements of the systems mitigation program for Hass avocados provided more than adequate capability for detecting *Stenoma* in fruit shipments.

On September 26, 2000, review participants attended a presentation on avocado seed moth by Dr. Luis Cervantes P. Although Dr. Cervantes primarily researches Heteroptera (true bugs), he worked on the biology of the seed moth recently [Cervantes Peredo , L., C.H.C. Lyal, and V.K. Brown. 1999. The stenomatine moth, *Stenoma catenifer* Walsingham: a pre-dispersal seed predator of Greenheart (*Chlorocardium rodiei* (Schomb.) Rohwer, Richter & van der Werff) in Guyana. Journal of Natural History 33:531-542.]. No one else has worked on this moth in Mexico in recent decades. Dr. Cervantes provided information important to evaluating the effectiveness of survey methods currently used in the USDA/SAGAR Hass Avocado Program. In particular, he:

- Believes that cutting fruit is the best method to provide early detection of *Stenoma* in areas thought to be free of the pest. He noted that cutting the fruit reveals a distinct brown trail in the pulp left by first instar (the smallest) larvae in the *Chlorocardium* host he studied. When asked, he said that the fruit cutting protocol used in the Hass avocado program should easily reveal these tunnels.
- Further stated that the current fruit cutting protocol used in the USDA/Mexico Hass export program was more than sufficient to detect *Stenoma* in orchards shipping to the U.S. Dr. Cervantes was confident in his opinion because he had observed this process in the field during the week of September 18, 2000.
- Does not believe that black light traps are an effective survey tool for the seed moth. As an example, Dr. Cervantes noted that he disturbed *Stenoma* moths while climbing a tree at one location in Guyana during the day. Moths were hanging in the tree in numbers (even though fruit infestation rates were less than 10%). He operated a black light trap near the same tree that night and caught no *Stenoma* moths. (Some literature recommends using light traps to attract *Stenoma* moths. Dr. Cervantes noted that this may be based on an assumption that because *Stenoma* are active at night and many other species of moths that exhibit this behavior are attracted to lights, then *Stenoma* too must fly to lights.)

- Expressed doubt that *Stenoma* ever occurred in Michoacan, despite several references from the literature that cite the pest from there. He contacted the authors of these references and each admitted that they did not have nor had seen specimens of the pest from Michoacan. Dr. Cervantes also checked all the major insect collections in Mexico and found no specimens. He believes the authors cited that the seed moth occurs in Michoacan because avocado is grown there.
- Noted that *Stenoma* has never been recorded as infesting Hass avocados. Because this pest and related moths are stem and seed feeders, Dr. Cervantes suggested that larvae may not be equipped to feed on fruit pulp for sustained periods on their way to the seed. *Stenoma* infest varieties of avocado that have thin pulp, unlike Hass avocados.

The program review group concurs with Dr. Cervantes expert opinion that current survey methods are adequate to detect avocado seed moth in export orchards.

Stem and seed weevils. Also in their letter, the California Avocado Commission expressed concern that APHIS personnel are not present for weevil surveys conducted before July. Adults of these weevils are probably active before July. Adult activity for the stem weevil, *Copturus aguacate*, peaks in June - August with a smaller peak in December - January.

No expert on avocado weevil pests attended the review. Dr. Cervantes stated that no one was working on these pests in Mexico. Nearly all participants agreed that more information on the biology, distribution and taxonomy of these beetles would be useful to the program. Joe Cavey will contact ARS and PPQ weevil specialists in an attempt to procure specimens, images, and more information on these pests and share results with meeting participants. Other participants will also investigate other sources.

The group reviewed the known distribution of the weevils with the following results.

- The stem weevil, *Copturus aguacate*, occurs in Michoacan and in municipalities having orchards that export to the U.S.
- The seed weevil, *Conotrachelus perseae*, occurs in Michoacan but not within exporting municipalities. In Michoacan, it occurs only in one small area near Ziracuaratiro. This area has been under eradication by SAGAR for the past three years. The quarantined area has been reduced from more than 600 acres to 140 acres during that period.
- The seed weevils, *Conotrachelus aguacate* and *Heilipus lauri*, are not known from Michoacan. They are recorded from nearby States but Dr. Cervantes could locate no specimens to confirm the records.

The program review group observed survey methods used to detect weevils. In the field, we observed the technique of beating and shaking sun-exposed lower branches over a white tarpaulan. One pine weevil, genus *Apion* (not a target pest), was produced by this method after beating about 20 trees. (Adult stem weevils and adults of non-target *Copturus* and *Conotrachelus* species have been detected using this method, in the past.) The group also observed fruit cutting procedures in

the field. Inspectors conducting the survey were thorough and knowledgeable about the program and target pests.

The group also visited the eradication site for the seed weevil, *Conotrachelus perseae*. We found infested fruit on the ground and saw distinctive damage caused by a single larva in a fruit. The inspection process of cutting fruit should clearly reveal the kind of damage we observed. *Conotrachelus perseae* is one of the two smaller seed pests in the avocado program. Presumably, damage caused by the larger *Heilipus lauri* (and *Stenomoma catenifer* seed moth) would be even more evident to inspectors.

The survey method for adult weevils and extensive fruit cutting protocol for larvae provide multiple opportunities to detect avocado pests in orchards approved to ship fruit to the U.S. All orchards that wish to ship avocado fruit to low prevalence pest areas of Mexico or export fruit are subject to Mexican Law NOM 66 requirements. The Law requires and Mexico conducts two stem weevil and one seed pest inspections per orchard per year. The Hass Avocado Program Workplan requires one stem weevil (adult) inspection per orchard per year and extensive fruit cutting for larvae of seed pests and fruit flies in the orchard, at the packing house, and at the port of entry.

These survey procedures should serve to detect target weevils associated with Mexican avocados.