FIVE-YEAR STRATEGIC PLAN 2008 – 2013 FOR FRUIT FLIES OF MEXICO

Part I. Executive Summary

Of all the quarantine plant pests in the world, species of the Tephritidae fruit fly family are among the most destructive and costly to manage or eradicate. The impacts or potential impacts of harmful fruit fly species to the United States and Mexico's agriculture production and export markets has never been greater. Acknowledging this fact and striving to protect North American agriculture, the U.S. and Mexico have made major efforts to identify and implement long-term strategies to protect agriculture interest from harmful fruit flies. Mexico has developed a 5-year strategic plan with a major goal to eliminate the quarantine significant *Anastrepha* species from Northern Mexico by 2012. The USDA, APHIS completed a strategic plan in 2005 focusing on fruit fly pests from a global prospective. One of five major priorities identified in the Exotic Fruit Fly Strategic Plan for 2006-2010 is to ***reduce the imminent threat of introduction or spread of Medfly and Mexfly from existing populations in Mexico***

In addition, two of the three major "five year" Goals listed in the strategic plan directly relate to fruit fly populations in Mexico.

Goal 2: Ensure Medfly does not move north of the State of Chiapas, Mexico.
Goal 3: Eradicate Mexfly from Texas and northern Mexico along the Lower Rio Grande Valley (LRGV) and maintain the area free of reintroduction.

To advance cooperative efforts between the U.S. and Mexico, a joint 5-year strategic plan specifically targeting fruit fly issues of mutual concern was needed. Our countries have a long history of working together fighting fruit flies. In the early 1960's, the two counties worked together to create and establish the first sterile Mexican Fruit fly rearing facility in Monterey, Mexico. Since 1977, we have worked together successfully to keep Medfly from establishing in Southern Mexico while preventing the Medfly's northerly spread into Mexico and the U.S. Through these cooperative efforts, we must continue to evolve in our knowledge and understanding of fruit fly issues and our ability to solve the many problems caused by these economically destructive fruit fly pests. There are numerous opportunities to build a comprehensive fruit fly reduction program in Mexico that will benefit both countries. During the next five-years, APHIS and DGSV (Direction General de Sanidad Vegetal) intend to implement a series of action plans designed to accomplish the overall goal of reducing fruit fly populations in Mexico.

After developing a detailed catalogue and studying and evaluating all of the fruit fly program activities in the U.S. and Mexico, we have determined the following four major goals to be the framework on which to build a comprehensive 5-year fruit fly reduction program in Mexico

I. Maintain Mexico Free of Medfly.
II. Enhance Mexico's National Fruit Fly campaign and focus on expanding fruit fly free areas in Mexico
III. Cooperate in the development, expansion, and compliance of bi-lateral agreements and international standards on fruit fly issues.
IV. Build effective relationships between U.S. and Mexico government personnel and industry personnel to enhance program results.

Part II. Introduction/Background

Both Mexico and the U.S. have much to gain from a comprehensive fruit fly reduction strategy in Mexico. Tephritid flies (Diptera: Tephritidae) are known as "true fruit flies" due to the close relationship between their immature stages and their wild and domesticated host plants. They are the most important dipteran pests of agriculture worldwide (Christenson & Foote 1960) and include 481genera and 4352 species (Norrbom et al. 1998).

Anastrepha is the most economically important and diverse genus of fruit flies widely established in the Americas, with 197 species distributed throughout tropical and subtropical areas (Norrbom et al. 2000). To date, 32 species are known to occur in Mexico. The economically important species in Mexico and those recognized by the U.S. as quarantine significant are *Anestrepha. ludens, A. obliqua, A. serpentina* and *A. striata.*

In the U.S., *A. ludens* is present in Lower Rio Grande Valley of Southern Texas, and *A. suspensa* is established in Florida, where both are considered quarantine significant pests. However, the *Medfly (Ceratitis capitata)* is an even greater threat to Mexico and the United States. Although the *Anastrepha* sps. listed above are the most important fruit flies endemic to Mexico and the U.S., with the introduction of the Medfly (*Ceratitis capitata)* into Central America, the Medfly has become the most significant fruit fly threat to U.S. and Mexican agriculture. The following pages discuss the reasons each of the strategic goals were identified as critical to enable success in our joint effort beginning with the top priority of "maintaining Mexico fee of Medfly.

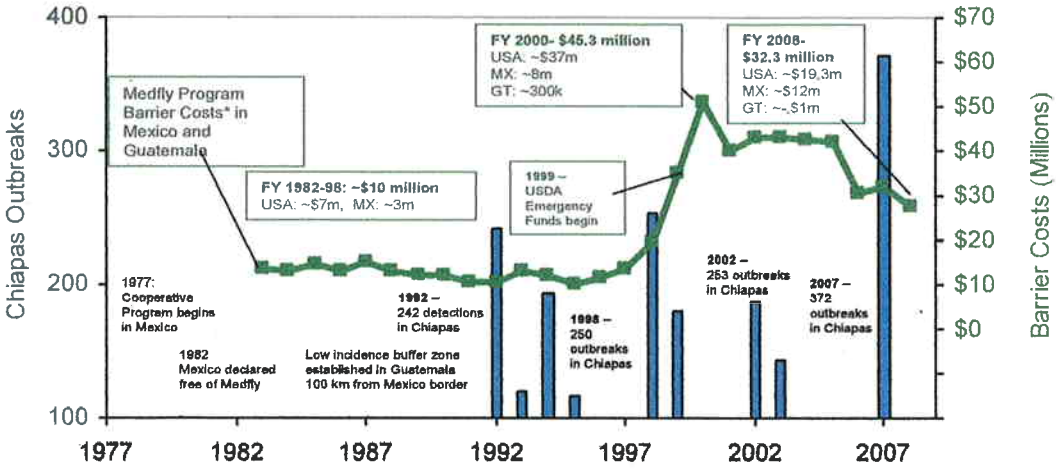
Medfly

Goal I. Maintain Mexico Free of Medfly

The Medfly was initially detected in Central America in Costa Rica in 1955. It spread north reaching Guatemala in 1976 and the Southern Mexico state of Chiapas in 1977. A tri-national program consisting of the U.S., Mexico, and Guatemala successfully halted the northern migration of the Medfly by 1982. On-going program control/eradication activities continue to prevent the northerly spread and establishment of the Medfly into Mexico, Belize, and northern Guatemala's Peten region. Since the establishment of this Medfly barrier zone, the Medfly has been detected north of the barrier, but effective eradication response has prevented the establishment of the pest in Medfly-free areas. Records indicate the Medfly has been detected and successfully eradicated in Mexico outside the program's fly-free barrier zone in the states of Tabasco in 1994, 1998, 2002, and 2007, Campeche in 1998 and 2005, and Baja California in 2004.

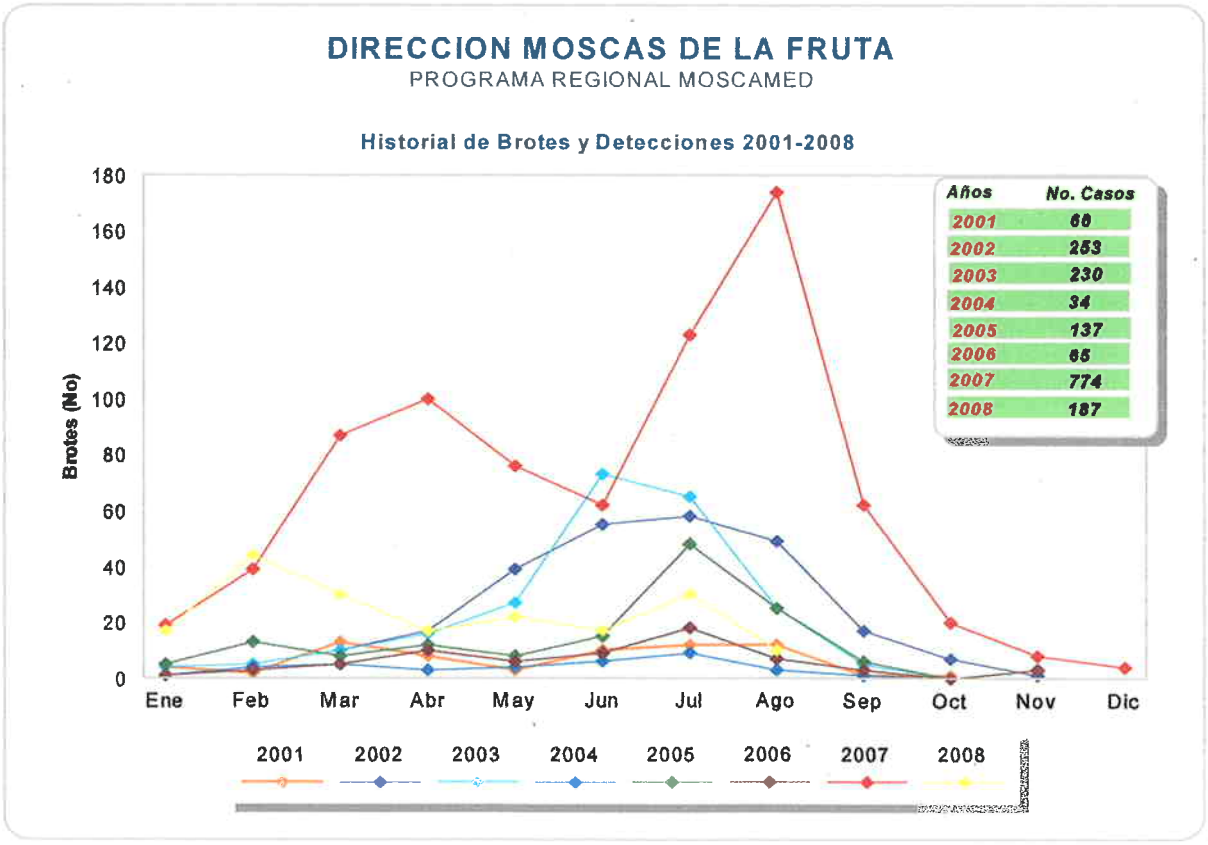
The following map and graph show the location of the cooperative program barrier and the costs to maintain it.

Medfly Barrier Costs and Outbreaks (1982-2008)



* Total spending by Mexio, Guatemala & USA , adjusted for inflation, with 2002 as basis for time series comparison

Since 1992, the barrier zone has signficantly eroded, with many more years with 100 or more outbreaks in Chiapas, even though the cooperators have significantly increased spending since 1999. In 2007, the program experienced its most massive Medfly population pressure since the program barrier was established in the early 1980s. Although there were a large number of



Medfly outbreaks in northern Chiapas and Guatemala, the barrier prevented Medfly spread into adjoining Mexican states, a significant success story, given the reduced program funding in the past three years. Fortunately in 2008, Medfly outbreaks through August (noted in yellow on the above graph) were dramatically lower in the barrier zone than the record 2007 outbreaks (noted in red). The major fluctuation in annual Medfly populations is partly due to environmental conditions however, the increasing number of outbreaks in "bad" years such as 2007 is of major concern to the program. Reduced funding has significantly impacted the response activities to the many outbreaks increasing the risk for the potential failure of the barrier.

Several expert panel reviews have concluded that the main reasons for the eroding barrier are related to three main factors:

- Destruction of a natural barrier zone made up of the Medfly host-free jungle areas of northern Chiapas and Guatemala,
- Requirements to switch to environmentally friendly insecticides, which are effective but much more expensive, and
- Local communities' refusing entry of Moscamed Program trappers and ground control teams.

The chart to the right summarizes Medfly captures over the past 10 years in California, when Mexico was free of Medfly above the Moscamed Program barrier zone. These California captures were from points of origin far from the U.S. border, mostly from Central America, according to DNA traceback analysis.

	MEDFLIES TRAPPED IN CALIFORNIA
1997	24
1998	95
1999	2
2000	0
2001	2
2002	1
2003	0
2004	1
2005	33
2006	0
2007	41
2008	3

Most fruit fly experts agree that if the Moscamed Program barrier failed, there would be a rapid spread and establishment of Medfly populations throughout many areas of Mexico, including large urban areas near the US-Mexico border. With the huge volume of people and cargo moving across the border, it is highly likely that there would be many additional Medfly outbreaks in California.

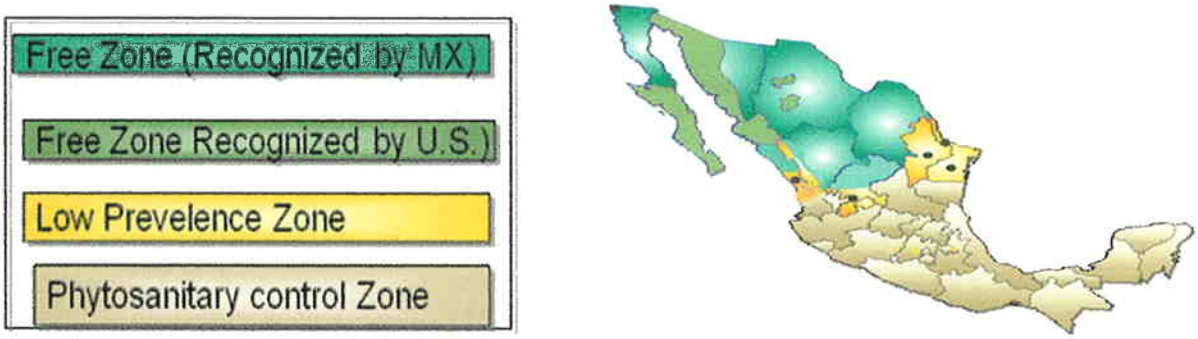
Considering only the economics of the Medfly, the 2002 value of 26 commercial host commodities produced in the United States totaled over $7 billion, and in Mexico, it was over $4 billion. The amount of losses estimated to be incurred by the United States with a widespread Medfly infestation is over $2 billion per year. In the event that Medfly becomes established in Mexico, annual losses are estimated to amount to $1.6 billion (in 2001 dollars). Together, the two countries would sustain about $3.7 billion in damages. Losses that would be incurred include the cost of field treatment, lower production, loss in export revenue, cost of export compliance treatment, and losses due to treatment damage. Mexico is estimated to incur about 44% of the losses while the share to the United States is 56%.

Therefore, it should be no surprise **that maintaining Mexico free of Medfly** is our first and highest priority strategic goal.

Goal II. Enhance Mexico's National Fruit Fly Campaign and focus on expanding fruit fly free areas in Mexico.

Mexico began its fight against fruit flies at the federal government level in 1934 in the Northeastern part of the country. Today, the fruit flies of quarantine significance in Mexico are generally established in the areas shown in yellow and brown on the map below. In 1992, agreements were established between the Federal government, the states, and the producers, to control and regulate native and exotic fruit flies in Mexico. These agreements resulted from the 1985 decree by the Mexican Secretary of Agriculture to initiate a National Fruit Fly Campaign giving the program national stature and support. The construction of the Metapa, Chiapas Moscafrut rearing facility in 1992 also greatly enhanced Mexico's operations to effectively combat fruit flies. Between 1994 and 1999, the federal laws and organizational structures were established in SAGARPA(The Secretaria de Agricultura Ganaderia Desarrollo Rural Pesca y Alimentacion) to provide the required legal authority to carry out the necessary components of the national fruit fly campaign - La Campana Nacional Contra Moscas de la Fruta (CNCMF).

As a result of this foundational work, Mexico has engaged in a program designed to prevent the entry of exotic fruit flies and to reduce quarantine significant native fruit fly populations throughout the country. Mexico has established internal quarantine systems and risked based regulatory programs to minimize the spread of native fruit flies within the country. Several successful fly free areas have been established in Mexico because of this campaign.



In addition, Mexico has an extensive surveillance program in 32 states for early detection of any exotic fruit fly species that might enter the country. Mexico and the U.S utilize most of the same technologies and techniques for dealing with all aspects of survey, regulatory, and control and eradication of fruit flies. These factors provide for an excellent opportunity to share human resources and expertise that could take this campaign to a higher level of success. Mexico created a very successful fruit fly free area in the state of Sonora in the early 1980's that has been used as a model for many Latin American countries. The excellent support and involvement of the growers in the state of Sonora has continuously been of the highest quality. The growers association has assumed the full responsibility to maintain the area free of fruit flies. This example of cooperation and success is proof Mexico and the U.S can develop common program goals and standards that can ultimately result in long-term reductions of fruit fly population in Mexico.

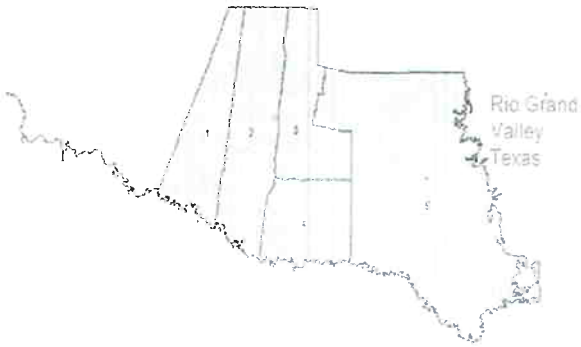
Enhancing Mexico's National Fruit Fly Campaign and focusing on expanding fruit fly free areas in Mexico provides a broad spectrum of mutually beneficial fruit fly reducing opportunities for

the U.S. and Mexico. Of the 32 Anastrepha species known to occur in Mexico, *Anastrepha.ludens, A. obliqua, A. serpentina,* and *A.striata* are economically important and recognized by the U.S. as quarantine significant species. These quarantine significant *Anastrepha* fruit fly species along with the Medfly form the basis for the critical fruit fly work in Mexico.

The Mexican Fruit Fly

Anastrepha ludens (Loew) (Mexican fruit fly or MFF) is a serious pest of numerous fruits. The Mexican fruit fly is a major economical problem for Citrus and mangos, in Mexico and Central America. Its natural distribution includes most of Mexico, and much of Central America as far south as Costa Rica and the Rio Grande Valley of Texas. The Mexican fruit fly was first discovered infesting citrus in the Rio Grande Valley of Texas in 1927. Flies were found along the California-Mexico border beginning in the 1950's. All varieties of citrus except lemons and sour limes are host. Grapefruit is the preferred host, with oranges second. Pear, peach, and apple are preferred among the deciduous hosts, and white sapote and mango are preferred among the subtropical fruits. The Mexican fruit fly is a frequent invader in California where eradication costs have exceeded $100 million over last 15 years.

In the Rio Grande Valley, adjacent to the Northern Mexican states of Tamaulipas and Nuevo Leon, populations of MexFly are aggressively monitored, controlled with area-wide releases of sterile MFFs (see figures) and all fruit shipments are highly regulated to protect other citrus growing areas in the U.S. Even with the major regulatory and control activities in the Rio Grande Valley of Texas, there is an ongoing risk to citrus growing areas in the U.S. It is estimated that an uncontrolled and widespread establishment of MFF in U.S. citrus would cost $900 million annually in losses to U.S. crop producers. Eradicating the MFF from south Texas would eliminate this risk to other parts of the U.S. from Texas and eliminate the regulatory cost to the Texas growers. However, this can only be accomplished with a successful joint U.S. /MX program operation.



TX-RGV Sterile MX Fly Release Area

N. Tamaulipas Sterile MX Fly release area

Beginning in the 2006/2007 production season the Mexfly eradication program initiated a long awaited eradication mode with releases of sterile flies over the entire Lower Rio Grande River Valley on both sides of the United States/Mexico border. The program on the Mexico side of the border added 200 sq. miles of release area. It stretches from Miguel Aleman to Matamoros, a distance of about 125 miles. Critical corridors are included in the program release area.

This has changed the direction of the program from management to eradication. It is a prime example of how Mexico and the U.S. must/can work together to enable common objectives when dealing with any biological organism since none of them respect political boundaries.

However, *Anastrepha ludens* will continue to threaten U.S. growers from other locations in Mexico. Finding additional opportunities in Mexico, especially in Northern Mexico, to work with Mexico to reduce these populations will provide additional long-term benefits to the U.S. growers.

Adding and/or expanding fruit fly free areas will also enable Mexico to export numerous host commodities to the US where a systems approach would not apply. With the increasing trend in demand for tropical fruits by US consumers, filling the market niche in the US while reducing overall fruit fly populations in Mexico becomes a win-win proposition. A reduction in fruit fly populations translates into improved economic health for both the U.S. and Mexican growers through market demand because the growers will be less likely to receive government subsidies if they are meeting market demand for their commodities. A good example of Mexico's efforts to reduce fruit fly populations and provide market access to growers in the states of Aguascalientes and Zacatecas is the guava project. Guava producers in these two states are spending over $1 million each year for the last five years to control *Anastrepha* populations in guava producing areas.

The three other quarantine significant species are:

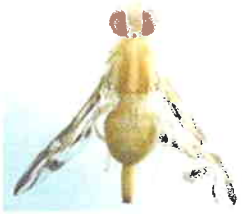
The Guava Fruit Fly

Anastrepha striata (Schiner) is a significant pest in the American tropics and subtropics. It is the major fruit fly pest of guavas and other Myrtaceous fruits, and is known to attack mango, mombins, orange, and peach. The USDA-APHIS-PPQ considers it to be of quarantine significance. Like all economically significant fruit flies, the larvae feeding inside, and destroying the fruit cause the main damage. The distribution in Mexico includes several states south of Sinaloa.

The Sapote Fruit Fly

Anastrepha serpentina (Wiedemann), is known as the serpentine fruit fly. In Mexico, this fruit fly is important because its larvae infest sapote (*Caloca.rpum* spp.), sapodilla (*Achras zapota*), willowleaf lucuma (*Lucuma salicifolia*) and related fruits. Infestations in parts of Mexico produce extremely high levels of fly populations. In some areas such as the state of Veracruz, fruit is harvested before it fully ripens to prevent the fly from destroying the crop. Fruit harvested in this manner due to reduced sugar content and size is inferior to tree-ripened fruits. The sapote fruit fly has been caught in Rio Grande Valley of Texas on several occasions. An infestation in South Texas in 2003 cost $1million to eradicate. It is believed that *Anastrepha serpentina* could become a serious pest of tropical fruits in southern Florida if it were introduced into that area.

The West Indian Fruit Fly



Anastrepha obliqua (Macquart) - The primary hosts for this fruit fly are *Spondias* spp. (Anacardiaceae) and mangoes (*Mangifera indica*). Anacardiaceae, are the economically important host, on which the species has extended its range (Hernandez-Ortiz, 1992). It has been determined that there is a low likelihood of *Citrus* spp. being a host and *A. obliqua* being in the pathway of commercial *Citrus* spp. "Sweet orange, *Citrus sinensis"*; "grapefruit, *Citrus paradisi"*; "sweet lime, *Citrus aurantifolia,"* and "sour orange, *Citrus aurantium"*. (Hennessey-Miller, 2004) Accordingly, these citrus species have been removed from APHIS' host list for *A. Obliqua*. An outbreak of *A. obliqua* in 2000 in the Lower Rio Grande Valley of South Texas cost $500,000 to eradicate.

In summary, these quarantine significant *Anastrepha* fruit fly species along with the Medfly form the basis for the critical fruit fly work in Mexico. The Mexico National Fruit Fly Campaign (CNCMF) provides a perfect foundation on which to build and improve fruit fly reduction strategies in Mexico. This will require an understanding of the process in Mexico and a willingness to cooperatively develop programs with mutually beneficial outcomes

Goal III.Cooperate in the development, expansion, and compliance of bi-lateral agreements and international standards of fruit fly issues.

Working in an international arena provides considerable challenges beyond the technical and scientific aspect of fruit fly strategies. The international agreements that enable the U.S. and Mexico to provide resources, define authorities and to jointly carryout the required work must be executed and carefully adhered to for a program of this nature to be conducted. Presently the U.S. and Mexico are working together on the basis of the 1973 Memorandum of Understanding, signed by Dr. Frank Mulhern and Ing. Benjamin Ortega Cantero.

It is further mutually understood by and between the parties hereto that in all other respects the terms, conditions, and provisions of said Memorandum of Understanding shall be and remain in full force and effect as therein provided.

The parties agree that this amendment shall become effective upon date of final signature.

SECRETARIA DE AGRICULTURA Y GANADERIA
DE MEXICO
DIRECCION GENERAL DE SANIDAD VEGETAL

Director

Oct. 9, 973.

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

Administrator

9/10/73
Date

The Moscamed program is operating based on a cooperative agreement signed in 1981 by D. Scot Campbell. Updating the foundational agreements will provide an opportunity and goal to clarify roles and expectations and explore opportunities for the fruit fly activities between the U.S. and Mexico. Examples of critical issues that could be included in updated/new agreements include:

1. Formulating operational arrangements for responding to emergency pests outbreaks in Northern Mexico or in the Southwestern U.S.

2. Enabling the use of APHIS/IS Mexican National personnel to participate with the Director General Phytozoosanitary Inspection (DGIF) personnel to perform quarantine activities at internal points of verification/ inspection sites.

3. Developing an agreement between growers and the DGSV/APHIS for grower-financed fly free zones, to improve communications and clarify requirements and expectations of all participants.

The U.S. and Mexico have worked together closely to establish NAPPO Regional standards for Phytosanitary Measures (RSPM's) through the North American Plant Protection Organization (NAPPO). The use of phytosanitary standards is becoming more and more important as we search for ways to define and develop safe import/export opportunities of fruit fly host. When, where and how international standards are used is not always clear or consistent. The standards (RSPM's or ISPM's- International Standards for Phytosanitary Measures) currently in place should be clearly understood and any "signing" country should work within the spirit of the international standards. Joint U.S. /MX training should be conducted to clarify current and future standards as they are adopted. Additional standards should be developed and implemented where appropriate.

Goal IV.Build effective relationships between U.S. and Mexico government and industry personnel to enhance program results.

When we examine the value of a fruit fly prevention/reduction program for Mexico, the incentives are not, in every case, the same for Mexico and the U.S. In the case of Medfly, our common goal of preventing this dangerous pest from establishing in Mexico, which would likely lead to its eventual establishment in the U.S., creates a common incentive. However, for Mexico, the incentive to control or eradicate native *Anastrepha* species is to open new markets or reduce the cost of production that currently prohibits or inhibits trade due to fruit flies. The major incentive to the U.S. is to prevent the potential production losses that would result from the establishment of fruit flies and to prevent the potential future loss of markets due to fruit flies. Understanding this basic distinction is critical to begin working through the many issues that challenge our ability to initiate and sustain a program of this nature.

A program of this magnitude depends on acceptable goals/incentives for all the participants. Over the many years of fruit fly, activities between the U.S. and Mexico there have been many successes such as the Moscamed barrier program that has prevented the northern movement of the Medfly into Mexico and the U.S. However, attitudes and cultural differences, possibly affected by different program incentives can affect the pursuit of a mutual goal to reduce fruit fly populations in Mexico. Developing trustworthy data systems, executing timely effective programs and maintaining accountable, transparent operations will be needed for long-term success. Understanding and respecting each other's position will be required to constructively reach our goal. Each country will need to be committed to solving problems while staying focused on the goal and maintaining an effective working relationship between all levels of the government and industry participants. Some policies work against this issue from the start. For

example all APHIS/IS employees who are citizens of the U.S. working in foreign countries are required to relocate every 2 years, (with special authorization 3 years) This relocation makes it difficult to establish the type of relationships that could benefit the program. It will be vital that individuals selected to work in program positions have excellent people and teamwork skills. Job standards must clearly reflect critical relationship skills and employees must be held accountable for appropriate job performance.

Political issues originating above the operations level can affect program objectives but every effort should be made to prevent these types of issues from spilling into the fruit fly program activities. Government and industry leaders must understand the priority of requiring and enabling the building and maintenance of effective relationships between decision makers, program managers, and any others affecting the potential outcome of the program. Our ability to establish an effective fruit fly reduction program and to maintain progress in this program will depend on trust and respect between those responsible for and those affected by all aspects of the program.

Part III. Mexico's Operational Program

Since 1994, the structure and legal authorities established in Mexico for combating fruit flies are a clear acknowledgment of their commitment and ability to deal with fruit fly pests. Dating back to May of 1934, Mexico published Interior Quarantine # 4, which established control activities against fruit flies on Northeast Mexico.

In 1985, the Mexican Secretary of Agriculture established a decree to the prevention and control of *Anastrepha, Rhagolitis and Toxotrypana* genera as of public interest. The decree also specified that the Secretary of Agriculture to establish a tripartite coordination between the federal government, state governments, and producers to cooperatively work for the control of fruit flies.

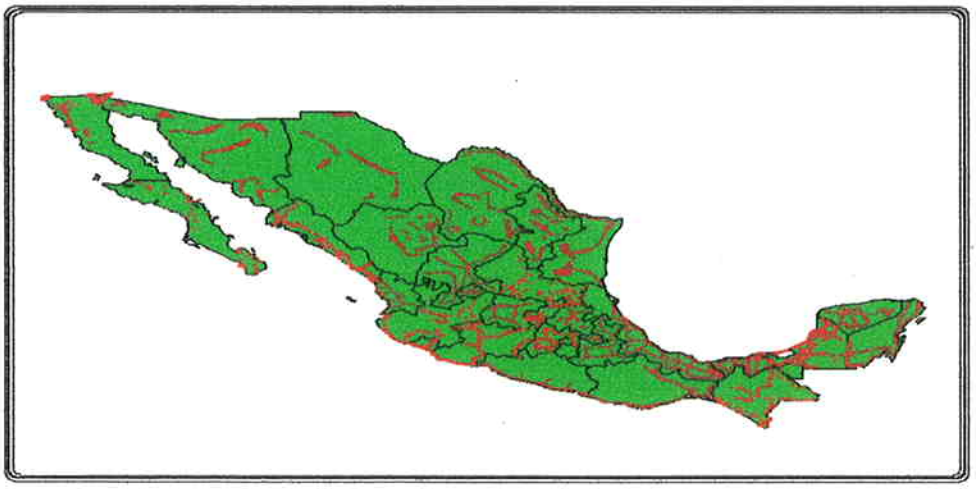
In 1992, actions increased to control fruit flies of the genus *Anastrepha.* The same year the building of a fruit fly rearing facility in Metapa, Chiapas, Mexico was initiated. With all the agreements and commitments in place, Mexico needed to establish the required authority to carry out the mandates specified in the agreements.

To establish this authority, in 1994 the Government of Mexico published the Federal Law for Plant Health and provided the foundation for the protection of Mexican agriculture giving the Mexican Department of Agriculture the authority to execute phytosanitary measures to protect and promote plant health.

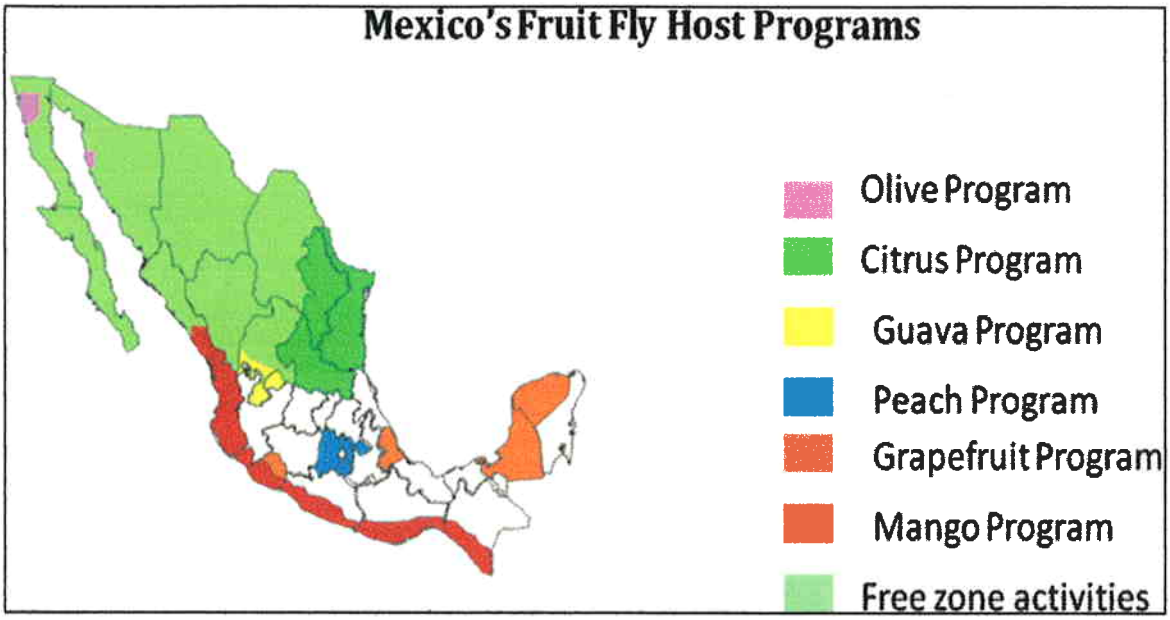
In 1999 the Mexican Secretary of Agriculture published in the Federal Register (Diario Oficial) of Mexico, NOM -023-FITO-1995, establishing the National Campaign for the Control of Fruit Flies with all the authorities and responsibilities specified. This Mexican NOM provided the authority to implement actions to reduce, control, and eradicate fruit fly populations so they could become competitive in the national and international markets. The Director of the National Campaign for the Control of Fruit Flies was established in Mexico under the General Director of Sanidad Vegetal because of the NOM -23-Fito-1995.

With the national campaign in place, the Secretary of Agriculture now needed the tools to control the movement of fruit fly host material within the country and specifically to the areas of Mexico that is free of fruit flies. In 1994, the creation of the Directorate for phytozoosanitary inspections was formed. The Directorate General for Phytozoosanitary Inspections, Direccion General de Inspeccion Fitozoosanitaria (DGIF) is responsible for the international inspection and exclusion program, and the intra country regulatory shipping activities and inspections necessary to prevent the spread of fruit flies within Mexico. This Directorate is under the Mexican Department of Agriculture, but is not under the umbrella of Sanidad Vegetal (SV). The Director is responsible for the Directorate decisions for the 107 offices located at maritime ports, border ports, airports, and quarantine stations within the country. After the DGIF was established, the Mexican Department of Agriculture published NOM-075-FITO-1997 in 1998. Mexican NOM-075-FITO-1997, established the requirements and phytosanitary specifications for the movement of fruit fly host material. This NOM specifies under what terms fruit fly host material can move to free zones and low prevalence zones. It also specifies the required treatments, and documentation that must accompany each shipment. The regulation of fruit fly host material is the responsibility of the new Directorate General for Phytozoosanitary Inspection (DGIF).
This unique organizational structure requires that the Director of the National Campaign for the Control of Fruit Flies in Mexico who is under the direction of Sanidad Vegetal to work closely with the director of phytozoosanitary inspections. In 2000, NOM- 076-FITO-1999 was established for the Preventive National and Emergency System against Exotic Fruit Flies. The NOM has as primary objective to prevent the introduction and establishment of exotic fruit flies of the genera *Ceratitis, Dacus and Bactrocera*, and some species of *Anastrepha and Rhagoletis.* It also specifies the procedures to be followed to activate an emergency response in case of a detection of any of the above-mentioned fruit flies.

Rutas Del Trampeo Nacional Preventivo contra Moscas de la Fruta Exótica – Trapping Routes for Exotic Fruit fly Detection in Mexico



When a detection of an exotic fly is made, anywhere in Mexico, the General Directorate for Sanidad Vegetal establishes a corresponding quarantine. The quarantine is enforced until Sanidad Vegetal through the Secretary of Agriculture publishes the removal of the quarantine. All aspects of fruit fly detection, control and eradication as well as, the requirements for fruit fly host movement are part of the many measures the fruit fly campaign implements and carries out.

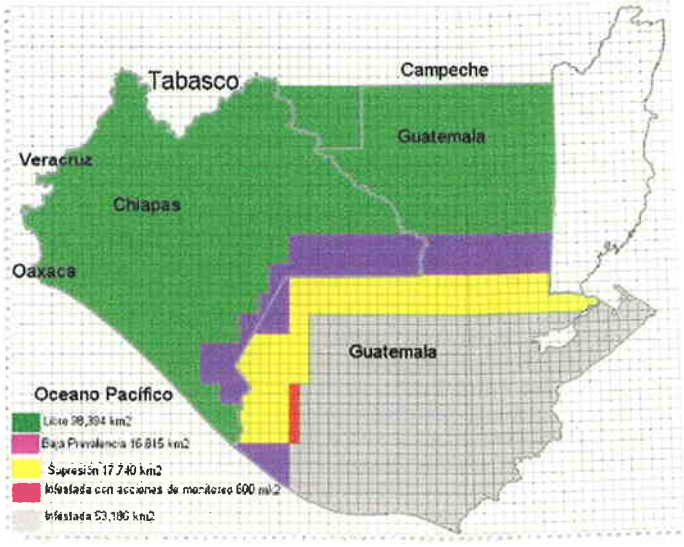


Operational Fruit Fly Program Activities in Mexico

Mexico National Exotic Fruit Fly Program

The purpose of the Preventative National System against Exotic Fruit Flies (SNP) is to verify freedom of fruit flies from critical areas in Mexico and to provide an early fruit fly detection program for fruit flies exotic to Mexico. Fruit fly trapping is conducted year round in all 32 states in Mexico. The Mexico wide program consists of 19,550 traps using five different trap types throughout 32 states. In addition, there are 21,000 traps in the state of Chiapas, which specifically detect Medflies (*Ceratitis capitata*). The program protects 1.7 million hectares of agriculture host products in Mexico valued at $4.5 billion annually.

Moscamed Eradication/Barrier Program



In 1977, the Governments of the United States, Mexico, and Guatemala initiated a cooperative program known as the Moscamed Program to eradicate the Medfly from Mexico and to maintain a barrier in Guatemala to halt the Medfly's northern spread. This program is designed to suppress Medfly populations and reduce the risk of introduction into the United States. Mexico has been free of Medfly since 1982, except for established infestations in the State of Chiapas adjacent to Guatemala. The total program involves approximately 130,000 sq. kilometers in Mexico and Guatemala. Mexico's program operational headquarters is in Tapachula, Chiapas, MX along

with a USDA program operation office. The USDA's operations headquarters is located in Guatemala City, Guatemala.

Rio Grande Valley Regional Mexican Fruit fly Eradication Program
Since its inception in 1984, the purpose of the Texas Mexican Fruit Fly program was to enable the interstate movement of host material (citrus fruit) from an area where Mexican Fruit Fly, *Anastrepha ludens* exists in South Texas. The U.S. regulatory program involves about 28,000 acres of Citrus (30% oranges, 70% grapefruit) scattered throughout three Lower Rio Grande Valley (LRGV) counties with an annual market value of $25-30 million. Within these counties, a total area of 780 sq. miles is being surveyed. The program was one of the first regulatory programs to incorporate sterile insect technique (SIT) into the overall systems approach.

Beginning in the 2006/2007 production season the program initiated a long awaited eradication mode with releases of sterile flies over the entire Lower Rio Grande River Valley on both sides of the United States/Mexico border. The ultimate goal of the program on both sides of the border is to establish fruit fly free areas.

The program on the Mexico side of the border consists of 200 sq. miles of SIT release area. Trapping activities are conducted weekly over the program area. It stretches from Miguel Aleman to Matamoros, a distance of about 125 miles. Critical corridors are included in the program release area. Except for one block of 200 acres of citrus, there is limited commercial fruit production in this area. From APHIS' perspective, maintaining an effective regulatory program to prevent the reintroduction of Mexflies from infested areas in Mexico is critical to success.

Baja California (Tijuana, MX) Preventative Release Program
This was the first Preventative Release program initiated by USDA, APHIS, PPQ. The *Anastrepha ludens* sterile release program was started in 1963 with static release methods. The static release method involved placing pupae in "static" non-moveable boxes thus reducing the effectiveness of the sterile release efforts. After several outbreaks of Mexfly in the Tijuana area in the early 1990's, additional funding was provided by the USDA, APHIS, IS upgrading the program to aerial SIT releases in 1994. The program is designed to prevent the establishment of Mexflies in an area of Baja California, MX that threaten Southern California each year. Year round SIT releases are made weekly over three major cities: Tecate, Rosarito, and Tijuana. 16 million flies are releases over an area of 160 sq miles each week. Mexico (DGSV) provides the sterile insects. The USDA, APHIS, IS and Baja California state committee jointly provide the trapping for this unique cooperative program. The state committee to prevent further spread treats any localized detections.

Mexico Fruit Fly Interstate Certification Program Regulated by Mexican NOM 075-FITO-1997
The Mexican NOM 075-FITO-1997, establishes the phytosanitary requirements and specifications for movement of fruit fly host material within the Republic of Mexico, and provides the authority to prevent the movement and distribution of these pests to the free zones and low prevalence areas.
Four of the northern states of Mexico: Baja California Sur, Baja California, Sonora, part of Sinaloa, and parts of Chihuahua are free areas of fruit flies. The United States Department of

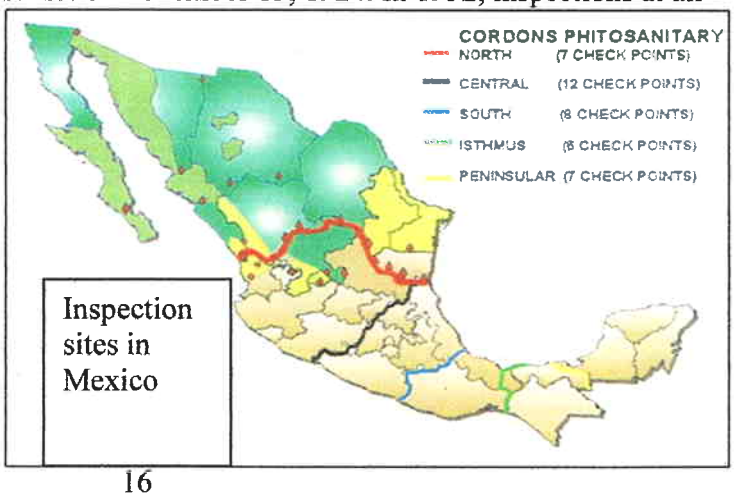
Agriculture and Mexico recognize these areas as free zones. The Mexican government with the support of state governments and producers work together enforcing the mandates of NOM 075-FITO-1997 to protect the free areas from becoming re-infested with fruit flies. The Mexican Government considers several other areas within the country to be low prevalence areas. Each one of these, whether low prevalence or free area, gets the legal protection from Nom 075- FITO -1997. The National Fruit Fly Campaign is the organization that implements and carries out the actions for fruit fly control, eradications, free areas, and low prevalence areas. The campaign gets its authority from NOM 075- FITO -1997 to allow movement of fruit fly host material and NOM 023- FITO -1995 provides the authority for actions at the production level.

Depending on the type of fruit transiting to or through a low prevalence or a free area, the requirements vary. Mexico describes fruit as; absolute quarantine or partial quarantine. Fruit identified as of partial quarantine is all fresh citrus fruit (genus Citrus), mango, guava, peach, apricot, pear, mamey, apple, and several others. For fruits listed under partial quarantine, a treatment exists which allows movement from infested areas to low prevalence areas, free areas or areas under control. For all fruits listed under absolute quarantine such as: Arrayan (*Psidiumsartorianum)*, Anona (*Annona spp*), Caimito (*Chrsophyllum caimito*), Yellow Chapote (*Sargentia gregii*), Chirimoya (*Annona cherimola*), Jobo (*Spondias mombin*), and many others, there is no treatment and cannot transit to or through low prevalence or free zones. The NOM - 075.FITO-1997 regulates industry handling any fruit fly host material, and the distribution centers.

Mexico Points of Inspection

After becoming a member of the World Trade Organization, the establishment of numerous international treaties with countries throughout the world, and the increased agricultural imports and export activities in Mexico, the risk of plant pest and animal disease introductions increased significantly in Mexico. In order to protect Mexican Agriculture from foreign introductions of pests and diseases and to prevent the spread of established pests and diseases to non-infested areas in the country, Mexico created the phytozoosanitary protection system. This directorate, established in 1994 is the Direccion General de Inspeccion Fitozoosanitaria (DGIF). Today, this organization is responsible for the international inspection/exclusion program and the intra country regulatory shipping activities/inspections necessary to prevent the spread of fruit flies within Mexico.

The present day organization has evolved from the original Phytozoosanitary Inspection Service that was established because of the Pest Act of November 15, 1924. In 1952, inspections at all points of entry into the country and the control of national movement were established under the direction of Direccion General de Sanidad e Higiene Pecuaria.



In 1974, the Sanidad and Phytozoosanitary Act mandated all phytozoosanitary activities. In 1991 phytozoosanitary Inspections began to professionalize its personnel.

Degrees in agronomy, veterinary medicine, and biology were required for all employees. One hundred percent of the officials working for the phytozoosanitary inspection service have degrees in one of these three branches of science.

Mexico Emergency Fruit Fly Response Program

The Secretaria de Agricultura Ganaderia Desarrollo Rural Pesca y Alimentacion (SAGARPA) through the Mexican NOM -076- FITO -1999 established the preventive system for introductions and establishment of exotic fruit flies of the genus *Ceratitis, Dacus, Bactrocera* and some *Anastrepha* and *Rhagoletis* fruit fly species. It also includes procedures to activate the National Emergency Directive when necessary. This NOM is applied throughout the Republic of Mexico, and regulates products from origination to points of commercialization such as transport systems, food warehouses, distribution centers, maritime ports, airports, ports of entry, tourist's centers, and highways.

The National Emergency Response for exotic flies established the National Vigilant System, which is operated by Sanidad Vegetal State Organizations (OASV). Based on the magnitude of the problem, the Sanidad Vegetal State Organization will initiate actions in response to the detection of an exotic fly or a native fly in the free areas of Mexico. It is the responsibility of The Mexican Department of Agriculture to implement the Emergency Response Program. The Mexican Department of Agriculture (SAGARPA) through Sanidad Vegetal dictates the official instructions that initiate the National Emergency Response. As dictated by NOM-076- FITO - 1999, an Emergency Response Team, staffed by personnel from the Medfly program in Chiapas, Mexico responds and initiates onsite emergency action plans within 48 hours of the official identification. At present, there are specific National Emergency Directives ready to be implemented for Medfly and olive fruit fly. Emergency response may be implemented upon request if necessary for 21 additional exotic fruit flies species.

Insect Rearing Facilities

In the United States, Mexico, and Guatemala where fruit flies are a severe threat, sterile Medflies, and fruit flies of the genus *Anastrepha*, are being released in the high-risk areas to prevent the establishment of these pests.

Sterile insect rearing facilities located in Metapa de Dominquez, Chiapas, Mexico and Los Pinos, Guatemala provide sterile insects for eradication, suppression, and prevention programs against various fruit fly pests. The rearing facility located at Los Pinos, Guatemala produces sterile Medfly for releases in Guatemala, Mexico and the U.S. (Florida and California). This rearing facility produces up to 3.5 billion temperature sensitive lethal (TSL) male pupae per week. The Medfly rearing facility in Metapa, Chiapas produces 500 million TSL pupae per week. This production is released in Chiapas, Mexico. The Moscafrut rearing facility also located in Metapa, Chiapas currently produces 220 million Mexfly and 50 million West Indian fruit fly(*Anastrepha obliqua*) pupae per week. The production is distributed to seven different eclosion laboratories located in Mexico. The main goal is to protect the quality of food and agricultural products. The sterile insect technique (SIT) is the biological control of pests using an area –wide inundative release of sterile insects to reduce reproduction in a field population of the same species. In Mexico, sterile fruit flies are released to suppress and eradicate *A. ludens and A. obliqua*, in the location/State indicated in the table below.

Metapa Rearing Facilities

- In the small town of Metapa de Dominguez, Chiapas the Rearing, facilities for Medfly and Mexfly (Moscafrut) are located side by side.

- Moscafrut Rearing Facility has a capacity to produce 300 million Mexfly pupae per week. The current production is 220 million pupae per week.

Moscafrut Fruit Fly Rearing Facility – Maximum Weekly Sterile MexFly Distribution

Tijuana, Baja California	16 million per week
Montemorelos, Nuevo Leon	100 million per week
Aguas Calliente/Zacatecas	40 million per week
San Luis Potosi	3 million per week
Cuidad Victoria, Tamaulipas	40 million per week
Sinaloa	20 million per week
Nayarit	10 million per week
Durango	4 million per week

- The Medfly rearing facility has a capacity to produce 500 million pupae per week. This is the current production level

The Moscafrut Rearing Facility also produces:

West Indian Fruit Fly (*Anastrepha obliqua*).
The current production is 40 million pupae per week. The production is sent to the following eclosion laboratory where SIT releases are made weekly to control/eradicate *A. obliqua* populations in these areas.
Sinaloa receives, 25 million per week.
Nayarit receives, 15 million per week.

When a detection of *A. obliqua* is made in low prevalence areas or free areas, releases of *A. obliqua* are made and they continue until the pest is eradicated

The Parasitoid *Diachasmimorpha longicaudata* is also produced and released in various parts of Mexico for control of fruit flies. The majority of these parasitoids however are released within the Moscamed barrier program.

International Certification Programs
Agriculture trade between the U.S and Mexico has been a significant part of both countries' import/export business for many years. From the period, 2003-2006 Mexico exported to the United States 85% of its fruit exports and 92% of vegetable exports. The combined dollar amount for these two groups was $3.37 billion. Mexico imported from the United States during the same time, 74% of its fruit imports, and 80% of vegetable imports. The dollar amount for these two groups was over $650,000,000.

Based on this information, it is easy to understand why the United States and Mexico cooperate so closely when it comes to agriculture products. Both countries have strived to open the borders to agricultural products using advanced scientific, risk based strategies whenever they could be

used safely. This cooperation has resulted in the establishment of national and regional programs that have limited the introduction of pests and diseases in each country.

The export program operations in Mexico require work plans to be developed for each commodity and negotiated on a yearly basis. Work plans have very specific requirements by the country receiving the product. It specifies field operations, packing and shipment requirements, and the types of treatments allowed and required for the commodity. For these reasons, each commodity requires its own work plan. There are two basic categories of work plan/risk areas. Work plans for agriculture products from 1) fruit fly free areas and 2) work plans for agriculture products from fruit fly infested areas. The Work plans for commodities moving from fruit fly free areas in Mexico are, in general, less complicated since treatments are not needed. With the cooperation of the United States, five states in Mexico have reached fruit fly free status. These fruit fly free zones have been recognized by the United States Department of Agriculture, and can export citrus, mangoes, fig, apples, pitaya, and pomegranate to the United States without treatment. As for non fruit fly free areas, both countries have utilized systems approach programs where biological sound procedures allow movement of fruit to either country using a combination of pest mitigation strategies to enable an overall acceptable level of risk for agriculture products. Work plans for this type of program specifies the field operational requirements as well as packing and shipment procedures. Under the system approach, Mexico exports Hass avocados to the United States. From the U.S., sweet cherries, avocados, and stone fruit are exported to Mexico. The oldest work plans for both countries are commodities requiring treatments. Treatments, such as cold treatment and methyl bromide, are utilized in the United States for commodities, such as apples and stone fruit for several quarantine pests. Mango exports from Mexico to the U.S. require hot water treatments while citrus exports from Mexico require vapor heat or methyl bromide treatments for fruit flies.

Part IV. Five Year Strategic Goals and Strategies

Summary of Goals and Strategies

I. Maintain Mexico Free of Medfly

A. Assure technically sound program operations

B. Provide adequate, stable funding to conduct effective program operations

C. Maximize program delivery with available funding by assuring cost effective program operations

II. Enhance Mexico's National Fruit Fly campaign and focus on expanding fruit fly free areas in Mexico.

A. Stimulate support for the campaign in the US and Mexico

B. Maintain focus on *Anastrepha* sp .considering the need to stay focused on the constant threat of Medflies from the Mexico/Guatemala border or other possible new priority pests in Mexico.

C. Develop a Pilot project for a fly free zone or place of production area freedom in Mexico. Incorporate and document all necessary components required to complete a comprehensive approach to joint US/MX free area certification. (Includes 8 specific additional initiatives listed in the addendum of this strategic plan)

D. Strengthen the existing internal quarantine program currently in place in Mexico and consider other possible mitigation strategies.

E. Develop economic analysis (cost-benefit) of controlling *Anastrepha sp.* in all of Mexico.

F. Eradicate Mexfly from northern Mexico along the Lower Rio Grande Valley and maintain the area free from reintroduction *of Anastrepha* sp.

III. Cooperate in the development, expansion, and compliance of bi-lateral agreements and international standards on fruit fly issues.

A. Update/modernize relevant international agreements with Mexico.

B. Develop any new standards or update current standards (RSPM's)

C. Insure compliance of current international standards

IV. Build effective relationships between U.S. and Mexico government personnel and industry personnel to enhance program results.

A. Create opportunities to improve communications and cultural awareness for key personnel/Leaders in both countries.

B. Establish joint planning meetings designed to enable clear communications and understand common goals.

C. Jointly develop, evaluate, and implement a timely, clear, and reliable reporting system that is understood and trusted by all.

Explanation of Strategic Goals and Strategies

Strategy A - Assure Technically Sound Program Operations – Clarify and strengthen the responsibilities of the Technical Advisory Committee (TAC). Ensure that program scientists in Guatemala and Mexico have a formal role in the Technical Advisory Committee meetings. Develop a charter to establish selection criteria/processes and to define the procedures and responsibilities of the TAC. Include in the charter of the Unified Management Team (UMT) specific guidance on how to evaluate and implement TAC recommendations, and ensure that local program scientists have an opportunity to provide input and advice.

This action will assure the most up-to-date, technically sound program strategies and program operations are being utilized for the program. The nature of the program requires the best

possible expertise to provide this critical guidance. Bringing in new members and formally including program scientists (methods development) in the TAC to provide new ideas or challenge old ideas that may need updating is one possible approach. UMT co-director agreement on a process to evaluate and implement the TAC recommendations, on a regional basis, will help ensure that program operations are as effective and efficient as possible across the regional program.

Developing a charter will provide direction needed to assess/review critical scientific issues needed for improving program operations.
In addition to developing a process to evaluate and implement the TAC recommendations, the charter should address the TAC membership and when and how often it should be convened. The increasingly frequent waves of massive Medfly population pressure in Guatemala and the increased risk of introductions into the high risk areas of the U.S. such as California and Florida, make timely action very critical.

Strategy B - Provide adequate stable source of funding for program operations.
Maintaining the Moscamed Program barrier zone has become more uncertain, due to the increased Medfly population pressure in the southwest Guatemala coffee belt and changes in the size and nature of the barrier zone along the Mexico-Guatemala border. To reduce the uncertainty of being able to hold back the Medfly pressure, additional funding would widen and strengthen the barrier. Program managers believe that they need to widen the barrier at least 100 kilometers south of the Mexico-Guatemala border in order to have more certainty that the barrier will hold during periodic waves of massive Medfly pressure (like 1998 and 2007).

Options for additional funding to consider may be from internal redirection of federal funding, new federal funding from the U.S. or Mexico, possible international sources, and industry funding. The Government of Mexico considers the Moscamed program to be of the highest Priority and is providing substantial support to the program. However, additional resources need to be directed towards the program.

Strategy C - Maximize program delivery with available funding by assuring cost effective program operations.

This action is required to determine if there are ways the program can be operated more efficiently. APHIS and SENASICA agreed in 2004 to explore forming a commission, similar to the US-Mexico Screwworm Commission, to enable the program to operate more like a business, free of governmental restrictions on purchasing supplies and equipment and human resources management. The USDA has approved the proposed commission and further details/agreements need to be determined to enable implementation.

In the meantime, program staffing and major program expenditures should be examined for any possible cost savings. Any cost savings can be redirect to program delivery, increasing the overall effectiveness of the mission. The new joint program accounting system, called SIANET, may serve to improve program decision-making and budget adjustments.

Goal II. Enhance Mexico's National Fruit Fly Campaign and Focus on Expanding Fruit Fly Free Areas in Mexico.

Strategy A - Stimulate support for the fruit fly campaign in the United States and Mexico.

Mexico's National Fruit Fly Campaign was established in 1985, and since then, it has worked with the Mexican industry and agricultural entities establishing control and eradication actions against fruit flies. Several successful fruit fly free areas have been established because of this campaign. However, very little is known in the United States about the campaign and its accomplishments.

Strategy B - Maintain focus on *Anastrepha* sp. considering the need to stay focused on the constant threat of Medflies from the Mexico/Guatemala border or other possible new priority pests in Mexico

The primary goal of this strategy is to keep focused on fruit flies of the genus *Anastrepha,* and develop recommendations that will have an impact on fruit fly populations in Mexico, which in turn will benefit the United States. Medfly (*Ceratitis capitata*) and Mexfly (*Anastrepha ludens*) remain the primary threats of United States agriculture, however, detections of new pest species will continue to challenge funding and operational priorities.

Strategy C - Develop a pilot project for a fly free zone or a place of production freedom location in Mexico and Texas. The objective is to create an area free of fruit flies that could be used as a model for the rest of the citrus producing areas in Mexico.
A fruit fly free area and place of production locations will enable enactment of Mexican federal regulations designed to protect and maintain the area free of fruit flies.
The following steps are recommended to establish the pilot project in Mexico or Texas.

a. Gain growers approval and support for the pilot project.
b. Organize a joint US/Mexico steering/technical committee for the project. The Steering Committee will provide guidance, oversight, recommendations regarding field strategies and operations carried out by Project Managers.
c. Develop a detailed feasibility study for the pilot project
d. Gain highest level of administration support from both countries to commit to program success and market access.
e. Identify critical issues and problems areas arising during the development and implementation of the pilot project
f. Based on the results of the pilot project, develop a comprehensive program manual to educate/inform prospective grower groups to serve as a guide for additional fly free areas or place of production locations.
g. Meet with interested grower groups to provide information and guidance using the manual and agreements developed from the pilot project
h. Upon review and request by Sanidad Vegetal, additional free areas or place of production locations will be considered, approved, and established by both sides.

Strategy D - Strengthen internal quarantine system In Mexico (road stations) by allowing APHIS national employees in Mexico to collaborate through the Directorate of Phytozoosanitary Inspections to reinforce the agricultural quarantine and inspection system.

The Sanidad and Phytozoosanitary Act of 1974 mandated Phytosanitary activities in Mexico. Since then, the inspection service of Mexico has gone through several changes, including different names. In 1994, the General Directorate of Phytozoosanitary inspection (DGIF) was created and as a result, the quarantine system has continued to grow in responsibilities and size. The Directorate of Phytozoosanitary Inspection enforces the mandates of Mexican NOM-075-FITO-1997.This NOM establishes the requirements for movement of fruit fly host material from fruit fly infested areas to non infested areas; from areas under control; or those areas categorized as low prevalence areas. The Directorate of Phytozoosanitary Inspection divided the country from north to south into five regions. The central and southern part of Mexico has inspections stations at major roads and highways. Federal inspectors with the authority to inspect and confiscate staff the inspection stations. The northern part of Mexico, due to its free status of fruit flies and other pests and diseases is only equipped with Points of Internal Verification (PVI's). Inspectors at these stations are only authorized to check documentation, and some points of verification may be equipped to provide fumigations. These stations are not authorized to inspect or confiscate quarantine products. Through the years, APHIS has collaborated closely with Mexico's quarantine inspection service during the establishment of free zones in Northwest Mexico. These quarantine activities benefit the U.S. by reducing the risk of fruit fly introductions into the Western U.S. However, in the last few years, Mexico's quarantine inspection service has discontinued the use of APHIS personnel at these critical inspection facilities

Strategy E - Develop economic analysis of *Anastrepha* species in Mexico.

While considerable economic analysis has been accomplished in Mexico for the Medfly *(Ceratitis capitata)* very little official economic analysis for *Anastrepha* sp. is available. This analysis would validate the potential economic benefits to Mexico for reducing populations to levels that would enable expanded trade opportunities. It would also provide additional information on which to develop program strategies, especially for low prevalence areas in Northern Mexico.

Strategy F - Eradicate Mexfly from northern Mexico along the Lower Rio Grande Valley and maintain the area free from reintroduction of *Anastrepha* sp.

Eradication of *Anastrepha ludens* from the LRGV is a major goal noted in the APHIS Exotic fruit Fly Strategic Plan FY-2006-2010. This strategy builds on this goal by focusing on the Mexico regulatory component needed to prevent reintroduction of *Anastrepha* sp. into the area from infested areas in Mexico.

Goal III. Cooperate in the development, expansion, and compliance of bi-lateral agreements and international standards on fruit fly issues.

Strategy A - Update/modernize relevant international agreements with Mexico

Two major international agreements – 1) 1973 Memorandum of Understanding and 2) the 1981 Cooperative Agreement with Mexico for the Moscamed program need to be updated. An evaluation needs to be accomplished to determine if there is need for additional agreements to enhance cooperative program results. Appropriate actions will be required to execute any new or updated/amended agreements.

This strategy is needed since the Cooperative Agreements and Memorandum of Understanding presently in effect date back to 1981 and 1973, respectively. New technologies, changes in organizational structures, new regulatory authorities, evolving plant health programs and several other factors need to be revisited to determine how these agreements can be updated to enable the U.S. and Mexico to conduct effective cooperative plant health programs.

Strategy B - Working with appropriate NAPPO/IPPC committees, develop an ongoing system to identify, create, and implement new or updated phytosanitary standards (RSPM OR ISPM's) for fruit fly activities.

NAPPO/IPPC standards are critical for defining consistent, comprehensible operational principles and values for fruit fly activities/ procedures between countries. Although phytosanitary standards cannot override laws and regulations of Mexico and the U.S. concerning fruit fly activities, phytosanitary standards provide a basis for countries to describe and interpret mutual requirements to enable safe, consistent, trade of fruit fly hosts. For this reason, keeping phytosanitary standards updated and identifying and developing any new standards that are required, will expedite trade opportunities between countries where fruit flies are of concern.

Strategy C - Insure compliance of current International Standards

It is important that members from "signing" countries work within the spirit of the NAPPO and IPPC Standards for Phytosanitary measures. This strategy is intended to examine compliance with these standards and to explore approaches to improving compliance in the U.S. and Mexico.

Goal IV. Build Effective Relationships between the U.S. and Mexico's Government Personnel and Industry Personnel to enhance Program Results.

Strategy A - Create opportunities to advance improved communications and cultural awareness for key personnel/leaders in both countries.

Throughout many years of fruit fly activities between the U.S. and Mexico, there have been many successes, such as the Moscamed barrier program to prevent the northern movement of the Medfly into Mexico and the U.S. However, attitudes and cultural differences, possibly affected by different program incentives can affect the pursuit of a mutual goal to reduce fruit fly populations in Mexico. Taking the time and effort to develop specific processes designed to

build relationships and trust and respect among decision-makers and program personnel will greatly enhance the likelihood of success of this overall effort.

Strategy B - Establish joint planning meetings designed to enable clear communications and understand common goals. Examine best practices based on historical successes.

Although planning meetings will always be part of any new program, understanding the unique nature of this joint program and understanding the need and demonstrating the ability to communicate joint decisions are critical to program success. Exploring processes and activities that have been successful will enable positive, constructive dialogue and encourage proven effective program implementation

Strategies C - Jointly develop, evaluate, and implement a timely, clear, and reliable reporting system that is understood and trusted by all.

Developing trustworthy data systems, executing timely effective programs and maintaining accountable, transparent operations will be needed for long-term success. A clear, timely, and reliable system for collecting and reporting critical fruit fly program data could eliminate many of the questions often posed by both sides relating to data issues such as timing and format of reports

Part V. Cooperative Program Administration

Administering fruit fly program activities involving Mexico and the United States requires considerable knowledge and understanding of each country's complex organizational structure and operational systems. Understanding how to engage these structures and systems is vital to initiating program operations necessary for cooperative program activities to reduce fruit fly populations in Mexico. In addition, protection of free areas and areas of low fruit fly prevalence should be goal.

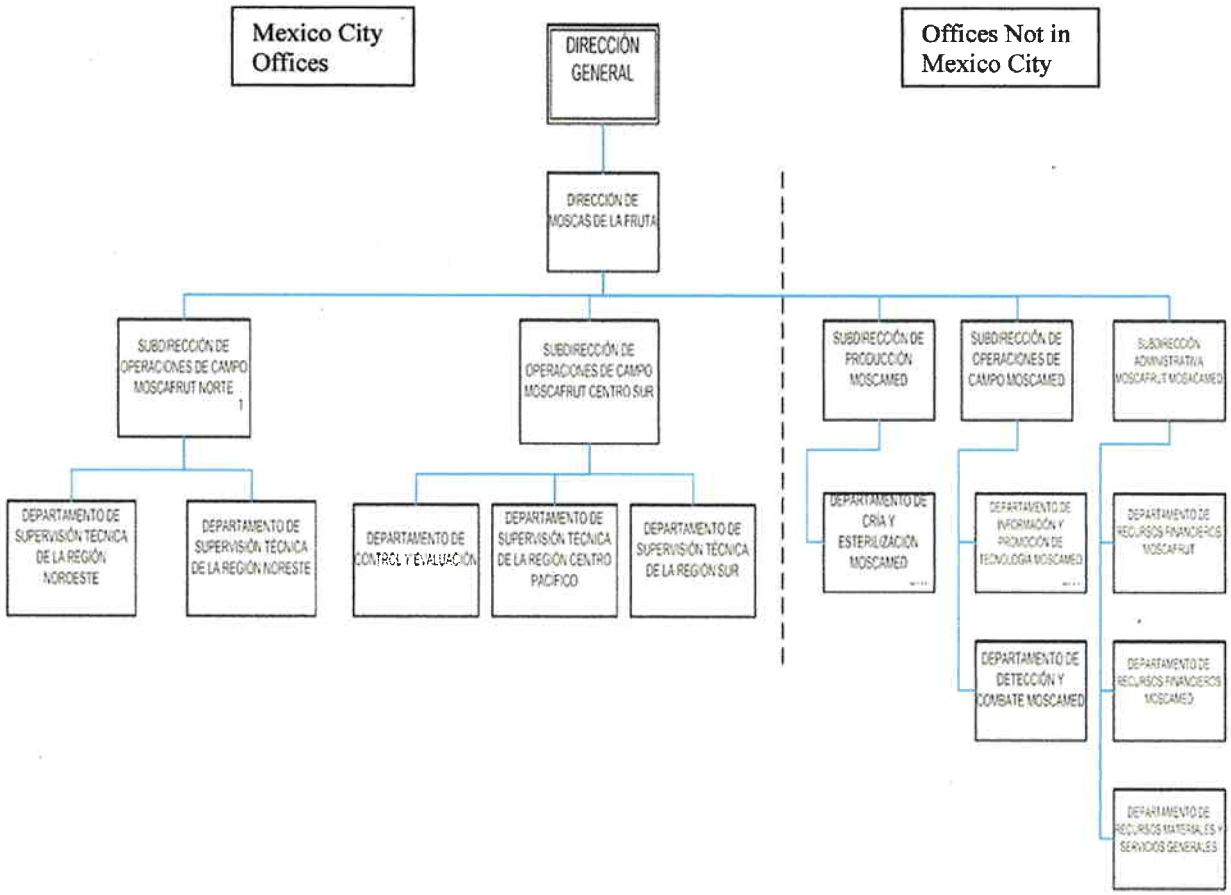
As described previously in this report, Mexico is extremely active in dealing with many aspects of fruit fly activities throughout the country. The control and eradication efforts for fruit flies in Mexico, including the Moscamed Program in the state of Chiapas are under the responsibility of the National Campaign for the Control of Fruit Flies (Campana Nacional Para el Control de Moscas de la Fruta).

The National Campaign is organized within The Directorate General of Sanidad Vegetal (DGSV). Since the Campaign was established, several fruit fly free areas have been declared and approved as free areas by USDA and other countries such as Australia, New Zealand, Japan and the European Union. The campaign is presently working in several areas in Mexico eradicating and controlling fruit fly populations with the support of State Committees of Sanidad Vegetal (Comites) and State Delegates.

The Director General for Sanidad Vegetal has a direct link to the State Governments, SAGARPA delegates and State Comites of Sanidad Vegetal involved in fruit fly control. These entities

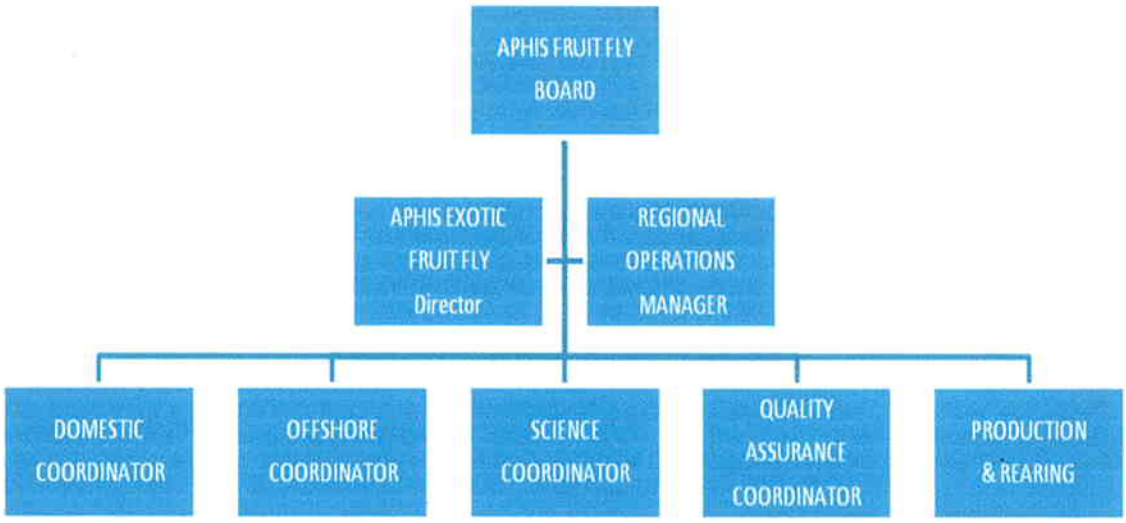
received financial support from the federal government for fruit fly activities. The Director of the National Campaign under the supervision of Sanidad Vegetal Director oversees all activities related to exotic fruit flies, Medfly and all *Anastrepha* species. In each Mexican state, the National Campaign Director has a coordinator that works directly with State delegates, State officials, and Comites. This coordinator is responsible for coordinating all field activities relating to fruit fly control, surveillance, eradication, and program actions as well as providing training for program personnel. The coordinator also has oversight responsibility for federal fruit fly funding and federal program expenditures.

National Campaign for the Control of Fruit Flies Organizational Chart



The National Campaign for the Control of Fruit Flies (CNCMF) is also responsible for two sterile insect rearing facilities including the research activities and methods development in the State of Chiapas. The Medfly rearing facility produces the sterile Medflies utilized in the program in Chiapas. The second rearing facility in Mexico is the Moscafrut rearing facility. It produces *Anastrepha ludens* that are distributed to eight eclosion laboratories throughout Mexico. This rearing facility also produces *Anastepha obliqua* that is used wherever needed in the country. In addition, the parasitoids, *Diachasmimorpha longicaudata* are produced at this location.

For the United States, the USDA, APHIS, is the lead federal agency that administers fruit fly program activities. Oversight and program direction for fruit fly activities come from the APHIS Fruit Fly Board. This board consists of APHIS lead officials responsible for various aspects of fruit fly program activities in the agency. The APHIS Exotic Fruit Fly Director is instrumental in providing agency coordination and overall agency program managements for APHIS' worldwide fruit fly program operations. For operations within the U.S. and U.S. territories, USDA, APHIS, PPQ is the responsible APHIS, unit. Fruit Fly activities in foreign countries are administered by USDA, APHIS, International Services. In Mexico, the International Services Regional Headquarters for North America located in Mexico City and its field organization stationed throughout Mexico are a vital link for cooperating with Mexico in all aspects of fruit fly activities in the country. APHIS, PPQ Regional Headquarters and State Plant Health Directors and their respective organizations in CA, TX, AZ and FL provide considerable operational and technical support to fruit fly program activities associated with the US/ Mexico border.



APHIS FRUIT FLY ORGANIZATIONAL CHART

Cooperators

In Mexico, management and coordination of the National Campaign for the Control of Fruit Flies requires the assistance and support of state governments, industry, Comites, exporters, packers, other federal and state agencies and the USDA and possibly other federal U.S. government agencies. Since much of the work for the fruit fly project will require the associated growers to fund activities (such as possible new host free areas), grower groups in select areas will be major, important cooperators.

In the United States, several key U.S. States affected by fruit flies are involved in all aspects of the program and have a stake in the work we do with Mexico. The most significant of these states are California, Texas, Arizona, and Florida. Therefore, these states support the work we do in Mexico to reduce the risk of fruit fly introductions into their states. Industry groups also play an important role in the United States. Opening markets in Mexico can be in conflict with U.S. growers, so it will be important to maintain an open dialogue with key U.S. grower associations.

Funding
Funding for fruit fly activities is very similar in the U.S. and Mexico. In both countries, funding may come from federal, state and industry sources. All three sources are commonly used on cooperative program activities. U.S. federal resources are used on programs in Mexico such as Moscamed and other cooperative programs beneficial to the U.S.

Scientific Support
Both Mexico rearing facilities, (Moscafrut and Medfly) have the support of a Methods Development Department that is located in the same complex as the rearing facilities. This laboratory has the responsibility to develop technologies needed by both programs. For example, Methods Development is cooperating with the USDA, APHIS, PPQ/Center for Plant Health Science and Technology Laboratory in Hawaii to develope a transgenic strain for mass rearing of *Anastrepha ludens*. For several years, the APHIS Hawaii and Metapa Chiapas laboratories have been also working on production and releases of *Diachmimorpha longicaudata* and *Coptera haywardi* parasitoids that target wild populations of fruit fly larvae and adults. A study to determine yeast efficacy in larval diet for *Anastrepha ludens, A. obliqua* and *Ceratitis capitata* is also underway. The Metapa laboratory is working in collaboration with the IAEA to establish an all-male strain (TSL) for *Anastrepha ludens*.

The Moscafrut campaign also gets scientific support from the Institute of Ecology (Instituto de Ecologia) located in Xalapa, Veracruz, Instituto Nacional de Investigaciones Agricolas y Pecuarias (INIFAP) in Mexico, as well as; the USDA, Agricultural Research Service (ARS) from Weslaco Texas. USDA, ARS is a major contributor of fruit fly scientific support for both the U.S. and Mexico.

Part VI. Performance Measures

1. Size (km2) of the medfly-free area in the Moscamed Program operations zones.
2. Number and location of Med fly detections in areas in MX outside of Chiapas
3. Increases in Fly Free areas in Mexico
4. Detections of *Anastrepha* in the LRGV

Performance measures for these Fruit Fly activities represent the most critical/beneficial activities in Mexico and the U.S.

Understanding the success or lack of success in the Moscamed program is paramount to our mutual goal of keeping the Medfly from advancing north into Mexico. Performance measure 1 and 2 should be used immediately to communicate the significance of the problem to obtain sufficient funding to widen and strengthen the Medfly-free portion of the Moscamed Program barrier zone.

Increases in fruit fly free areas will measure the economic success as well as the reduction in fruit fly populations in a self-perpetuating manner.

Measuring the *Anastrepha* populations in the LRGV will show both the performance of the sterile release program and the challenging regulatory component.

FIVE- YEAR STRATEGIC PLAN 2008-2013 FOR FRUIT FLIES OF MEXICO

Part VII. Key References

Secretaria de Agricultura, Ganaderia, Desarrollo Rural, Pesca, y Alimentacion, Servicio Nacional De Sanidad, Inicuidad y Calidad Agroalimentaria, Direccion General de Sanidad Vegetal. April 2007. Revision del Sistema Nacional Preventivo Contra Moscas de la Fruta Exoticas (SNP) y de la Campana Nacional Contra Moscas de la Fruta (CNCMF).

U.S. Department of Agriculture, Animal Plant Health Inspection Service, International Services, Area 1. April 2007. Report of Sterile Mexican Fly Releases Along The Mexican Border In The State of Tamaulipas.

United States-Mexico-Guatemala, Programa Regional Moscamed. October 5, 2006. Protocolo Para la Erradicacion De La Mosca Del Mediterraneo *(Ceratitis capitata)*.

United States Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine. 2007. Texas Rio Grande Valley Mexican Fruit Fly, *Anastrepha ludens,* Protocol.

United States Department of Agriculture, Animal Plant Health Inspection Service, International Services, Area 1. March 2006. Program Activities Report.

United States Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine. Various Dates. Eight Export Work Plans For Various Commodities To Mexico, Including Stone Fruit, Apples, Apples and Pears.

Diario Oficial De La Federacion. Norma Oficial Mexicana. NOM-023-FITO-1995. Por la establece la Campana Nacional contra Moscas de la Fruta. February 11, 1999.

Diario Oficial De La Federacion. Norma Oficial Mexicana. NOM-075-FITO-1997. Por la que establecen los requistios y especificaciones fitosanitarias para la movilización de frutos hospederos de moscas de la fruta. April 23, 1998.

Diario Oficial De La Federacion. Norma Oficial Mexicana. NOM-076-FITO-1999. Sistema Preventivo y dispositivo nacional de emergencia contra las moscas exóticas de la fruta. April 3, 2000.

Secretaria de Agricultura, Ganaderia, Desarrollo Rural, Pesca Y Alimentacion, Servicio Nacional de Sanidad,Inocuidad y Calidad Agroalimentaria, Direccion General De Sanidad Vegetal, Campana Nacional Contra Moscas De La Fruta. Manual Para El Control Integrado de Moscas de la Fruta. Manual del Productor.

United States Department of Agriculture, Animal Plant Health Inspection Service, International Medfly Eradication Program. Strategic Plan 2003-2015.

Secretaria de Agricultura, Ganaderia, Desarrollo Rural, Pesca, y Alimentacion, Servicio Nacional de Sanidad, Inocuidad y Calidad Agroalimentaria. Julio 2007. 25 Reunion de Consejo Tecnico Del SENASICA. Plagas Cuarentenarias de Alto Riesgo E Impacto Para La Agricultura de Mexico.

Guia (Work Plan) Para La Inspeccion, Certificacion y Exportacion de Frutos Frescos Del Estado de Baja California Sur Que Se Considera Como Una Zona Libre de Moscas de La Fruta Hacia Estados Unidos. Julio 2003.

U.S/Mexico Work Plan for Exportation of Hass Avocados from Mexico to the United States. 5/2005.

Addemdums to the Work Plan for the Exportation of Hass Avocados From Mexico to the United States, April 28, 2006, June 12, 2006.

U.S./Mexico Work Plan for the Exportation of Citrus from Low Prevalence Areas of Fruit Fly in the States of Nuevo Leon and Tamaulipas, Mexico. February 2004.

Addemdum to the US/Mexico Work Plan for Mexican Citrus Fruit Treatment and Preclearance. Forced Hot Air Treatment of Citrus Fruit in Mexico.

US/Mexico Work Plan for the Mexican Mango Preclearance Program.
Addemdum to the US/Mexico Work Plan for Mexican Mango Treatment and Preclearance. Forced Hot Air Treatment of Mango In Mexico.

US/Mexico Protocol for The Exportation of Papaya Produced in The Mediterranean Fruit Fly Free Zone B in The State of Chiapas to The United States.

US/Mexico Guia Para La Inspeccion, Certificacion y Exportacion de Frutos Frescos de La Zona Libre de Moscas de La Fruta En El Estado de Sinaloa Hacia Los Estados Unidos. Julio 2003.

United States Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine. June 19, 2006. Exotic Fruit Fly Strategic Plan FY-2006-2010.

Moscamed Program. August, 27-28, 2007. Technical Advisory Committee Report.

US/Mexico Guia Para La Inspeccion, Certificacion, Y Esportacion de Frutos Frescos De La Zona Libre de Moscas de La Fruta En Sonora Hacia Los Estados Unidos.

Anastrepha obliqua. Data Sheets On Quarantine Pests, EPPO Quarantine List No: 231. Prepared By CABI and EPPO For The E.U. Under Contract 90/399003.

Mexican Fruit Fly-*Anastrepha ludens* (Loew) (Insecta: Diptera:Tephritidae) Taxonomy-Synonymy-Distribution-Identification-Life Cycle-Hosts-Management-Quarantine. April 2004.

University of Florida Institute of Food and Agricultural Science/Department of Entomology and Nematology, Florida Department of Agriculture and Consumer Services/ Division of Plant Health.
H.V. Weems, Jr. and T.R.Fasulo. Reviewed August 2006. Guava Fruit Fly, *Anastrepha striata*

Schiner (Insecta: Diptera: Tephritidae). University of Florida, IFAS Extension.

H.V. Weems Jr. April 2001. University of Florida, IFAS Extension.

Baker A. C., W.E. Stone, C.C. Plummer, and M. Mc Phail. 1994. A Review of the Studies on the Mexican fruit fly and related Mexican species. U.S. Depart. Agric. Misc. Publ. 531::1-155.

Christenson L.D., and R.H. Foote. 1960. Biology of fruit flies. Annu.Rev. Ent.5::171-192.

Mike Hennessey & Charles E. Miller, November 29, 2004 USDA,APHIS Host Status of *Citrus* spp. for *Anastrepha obliqua* (Diptera: Tephritidae)

Hernandez-Ortiz V. 1992. El Genero *Anastrepha* Schiner en Mexico (Diptera: Tephritidae). Taxonomia, distribucion y sus plantas huespedes. Instituto de Ecologia Publ. 33. Xalapa, Veracruz, Mexico. 162pp.

Norrbom A. L., L. E. Carrol, F. C. Thompson, I. M. White, and A. Freidberg. 1998. Systematic database of names, pp. 65-251. In F.C.Thompson (ed.), Fruit Fly expert identification system and systematic information database. Backhys Publ., Leiden, Netherlands.

Norrbom A. L., R. A. Zucchi, and V. Hernandez-Ortiz. 2000. Phylogeny of the genera *Anastrepha* and *Toxotrypana* (Trypetinae) based on morphology, pp.299-342. In M.Aluja and A. L. Norboom (eds.), Fruit flies (Tephritidae): phylogeny and evolution of behavior. CRC Press, USA.

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GLOSSARY OF ACRONYMS

AZ- Arizona USA
ARS- Agricultural Research Service
APHIS- Animal Plant Health Inspection Service
CA- California USA
CNCMF- Campana Nacional Contra La Mosca de la Fruta
CPHST- Center for Plant Health Science and Technology
DGIF- Director General Phytozoosanitary Inspection- "Direccion General de Inspeccion Fitozoosanitaria"

DGSV- Director General of Sanidad Vegetal- "Direccion General de Sanidad Vegetal"
FL- Florida USA
IPPC-International Plant Protection Convention
INIFAP-Instituto Nacional de Investigaciones Agricolas y Pecuarias
IS- International Service
ISPM- International Standards for Phytosanitary Measures
LRGV- Lower Rio Grande Valley
MFF- Mexican Fruit Fly
MX - Mexico
NAPPO- North America Plant Protection Organization
NOM- Norma Oficial Mexicana
OASV- Sanidad Vegetal State Organization
PVI- Points of Internal Verification
PPQ- Plant Protection and Quarantine
RSPM- Regional Standards for Phytosanitary Measures
SV- Sanidad Vegetal
SAGARPA- Secretaria de Agricultura, Ganderia, Desarrollo Rural, Pesca y Alimentacion
SENASICA- Servicio National de Sanidad, Inocuidad y Calidad Agroalimentaria
SIT- Sterile Insect Technique
SNP- Preventive National System "Sistema Nacional Preventivo"
TAC- Technical Advisory Committee
TX- Texas USA
WTO- World Trade Organization
USDA- United States Department of Agriculture

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