

California Agricultural Trade: Combating the Medfly Menace

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Introduction

The medfly poses perhaps the single greatest pest-related threat to California's multi-billion dollar agriculture export industry. The pest is responsible for the mass destruction of a wide variety of crops, and continues to plague farmers and growers throughout the world. The threat of the medfly crossing international borders through trade in contaminated agricultural goods has prompted governments to take often-severe measures to prevent such a potential disaster.

The Japanese government has maintained a particularly firm stance with regard to standards and procedures governing the import of produce from countries having any history of medfly appearances. Although California agricultural exports to Japan play a significant economic role on both sides, the Japanese government remains committed to taking trade restrictive actions to reduce the possibility of importing medfly-contaminated products. As the most drastic measure, Japanese officials have indicated that Japan would impose a comprehensive embargo on produce imports from California due to increasing concerns over the presence of the medfly in certain produce-exporting regions. U.S. federal and state officials have responded to the intense foreign and domestic pressures by implementing a number of major control measures designed to rid the California agricultural industry of the menace of the medfly.

Despite the intensity of U.S.-California efforts to combat the pest, the medfly issue remains one of the key problems facing agricultural trade. It has created hostile political divisions among members of the government, farming, and scientific communities. Government officials face pressures from foreign governments and key interest groups, as the medfly continues to etch a lasting place in U.S. agricultural trade history. This case study examines the medfly crisis in California, from its beginnings in 1975, through the tumultuous 80s and 90s, and up to the current status of the issue.

CASE A: THE ORIGIN OF THE MEDFLY CRISIS

Background

The history of California's continuing war with the medfly is comparatively short, spanning approximately twenty years to the present. However, the conflict has proven to be extremely expensive and highly controversial in many aspects. The agricultural industry has long played a critical role in California's economy, prompting state and federal government officials to take any necessary actions to preserve the continued health of the industry. As the 20th century has progressed, California produce growers have witnessed significant expansion in the market for their agricultural goods. Accordingly, the state farmers have become increasingly dependent on out-of-state revenue sources for their produce. Expansion of California's agricultural export industry has included increased exports to other states within the U.S., as well as the opportunity to enter foreign markets such as Japan, South Korea, Hong Kong, Taiwan, and China. With reductions in some of the traditional trade barriers, and the encouragement and assistance of local, state, and federal governments, California's agricultural producers have recognized the value of the blossoming foreign export industry and have realized significant increases in the amount of exported produce.

While the health of the state agricultural economy has become more closely associated with export revenues, producers have found themselves subject to the product import standards and regulations of the countries receiving California goods. The plant quarantine laws adopted by each individual government determine these rules and standards. In Japan, the government has long had a reputation for implementing particularly stringent regulations on agricultural imports from abroad. The Japanese system is characterized by rigorous product inspection and import clearance procedures aimed at preventing the entry of any perceived agricultural pests and contaminants into the local environment (see Appendix A). Naturally, the Mediterranean fruit fly is categorized as a particularly dangerous exotic pest whose introduction to the Japanese environment could prove highly detrimental to its domestic agricultural industry. Should a medfly infestation ever occur in Japan due to agricultural trade, the occurrence might extract both high economic and political costs. Accordingly, the Japanese government has implemented particularly strict standards with regard to the medfly. Costs are also a consideration for the other side, as Japan has steadily evolved into the largest export market for California producers. This fact, coupled with the likelihood that other East-Asian governments such as Taiwan and South Korea would most likely follow Japan's lead in imposing agricultural trade restrictions, makes Japan's position on California agriculture and the medfly issue an extremely important one for all parties in the industry.

U.S. state and federal government agencies have responded to the medfly threat by supporting an aggressive program designed to monitor for the presence of the medfly. Officials have further implemented strict plant quarantine measures to contain a medfly

problem should one ever be discovered. State and federal agencies maintain an intensive and often controversial eradication program, incorporating the use of potentially risky pesticides such as malathion, to handle any outbreak of the destructive pest. Although the cost of these measures can be enormous, the medfly programs are viewed as essential to the preservation of both the agricultural industry and the general health of certain state economies.

The medfly case has confounded policy makers due to its complexity. California policy makers have been confronted by pressures from the U.S. federal government, individual U.S. state governments, foreign governments (namely the Japanese), public interest groups, the scientific community, various private interest groups, and the domestic agricultural industry. All sides have engaged in strong and frequent dialogues in pursuing their particular interests. These political struggles among the opposing sides have erupted into hostile exchanges in the courtroom and in the media. With the steady increase in inter-state and international trade, the current practices and procedures governing the California medfly issue are the result of these intense foreign and domestic pressures. In the course of addressing the unresolved concerns surrounding the medfly, policy makers will continue to face significant political and economic tension.

The Mediterranean Fruit Fly

As one of the most destructive pests known to the agriculture industry, the medfly can affect over 250 species of fruits, vegetables, and other crops. The medfly prefers fleshy fruits, such as peaches, apricots, and cherries, but may infest virtually any fruit as well as most vegetables raised in California^{1[i]}. Female medflies destroy fruit by laying large numbers of fertilized eggs beneath the skin's surface of the host fruit or vegetable. The eggs hatch into larvae, which then consume the pulp of the fruit or vegetable. The food product begins to rot, and usually falls to the ground. The larvae then leave the fruit, burrow into the ground, pupate, and finally reemerge as adult medflies (see Appendix B). The entire life cycle may take as little as three weeks during the warm summer months or can be as long as three months during the winter period^{2[iii]}. The length of the life cycle varies depending on the temperature of the environment and the exact species of host fruit or vegetable that the pest chooses to infest. These cyclical

^{1[i]} CDFA

^{1[iii]} CDFA

^{1[iii]} CDFA

^{1[iv]} James Siebert and Vijay Pradhan, "The Potential Impact of the Mediterranean Fruit Fly, *Ceratitis Capitata* (Wied.), Upon the Establishment in California: An Update", September 19, 1991, page 3

^{1[v]} Siebert and Pradhan, page 12

^{1[vi]} Siebert and Pradhan, page 18

^{1[vii]} Mark Wheeler, *Discover*, February 1993, page 44

^{1[viii]} Wheeler, page 45

^{1[ix]} Tom Abate, "Is the invading medfly eligible for California residency?" *Bioscience*, January 1993, Vol. 43 (1), page 4

^{1[x]} James Carey, "Establishment of the Mediterranean Fruit Fly in California", *Science*, 253, 1991, page 1369

^{1[xi]} Wheeler, page 5

variations make the medfly a particularly difficult insect to eradicate, as pesticides or other treatments cannot always be precisely timed to have the maximum effect. This results in the necessity for extensive measures to ensure that the pest has truly been contained. In every case, medfly-infested food products are rendered inedible and completely worthless on the market. The scope of destruction can be severe, with some farmers losing their entire crops in a matter of days or weeks.

The medfly is believed to have originated in the tropical climates of Africa. The pest later invaded Europe, parts of the Middle East, South America, Central America and Australia, eventually establishing itself in Hawaii during the first decade of the 20th century. The pest could not be eradicated due to the abundance of potential host crops and the highly favorable climate conditions in the region. Approximately twenty years later, the medfly made its first recorded appearance in the continental U.S. The pest was detected in several counties in the state of Florida. After intense eradication efforts using arsenic-molasses sprays, at an estimated cost of \$7.2 million, the pest was officially eliminated by the end of 1930. The pest reappeared in Florida on three separate occasions between 1956 and 1963. The pesticide malathion was used in the ensuing eradication efforts. Texas became the next victim in 1966. Here, malathion was again successfully used to eradicate the pest. By this time, California could only step up monitoring efforts and hope that the medfly would not be found within its borders. The medfly, however, did finally make its first appearance in Los Angeles, California, in 1975 signaling the start of one of the most complex trade cases in California's agricultural history.

The Medfly Eradication Program

In anticipation of future medfly discoveries within California's borders, policy makers enacted an eradication program designed to effectively deal with any potential medfly threat. This program consisted entirely of measures to be applied in the areas where medflies would be discovered, and did not include any post-harvest treatment of the affected crops. Once a medfly had been positively identified, government representatives were to declare a state-of-emergency, calling for swift actions to protect the important agricultural industry. Policy makers could readily declare an emergency due to the destructive reputation of the pest, given the fact that the medfly was not a permanently established resident of California. One of the key benefits to the emergency-based approach was that, as an "emergency," state and federal government funds would pay for the ensuing eradication program. Thus, the industry would receive its much-needed protection from the medfly without incurring state costs associated with eradicating the pest.

Once a state-of-emergency had been declared, officials would respond by placing a quarantine over a large area surrounding the actual discovery sight. Under the quarantine rules, no fruit would be allowed to leave the area. In addition, the government would dispatch a ground-based pesticide application force in order to conduct extensive ground spraying using the pesticide malathion. These measures would be accompanied by the release of hundreds of millions of sterile male medflies. These would hopefully

mate with adult female flies, rendering the female eggs infertile. It was believed that collectively these measures would effectively eradicate medflies in the affected area. The quarantine would then be lifted, and business would continue as usual.

For most parties involved in the issue, these measures provided an acceptable means of preventing medfly problems and, thus, allowed the continuation of the lucrative agricultural trade. Opposition, however, came from some public interest groups expressing deep concern over the potential hazards of using malathion. Nevertheless, industry interests prevailed and these methods were utilized, as policy makers seemed determined to take any steps possible to win a potential war against the medfly. Only time would tell if these measures would be sufficient to accomplish this ultimate goal.

First Contact

The medfly was first discovered in California during 1975 in Los Angeles. It is believed to have arrived due to the illegal entry of contaminated fruit. After the initial medfly detection, the problem quickly swelled into an infestation. California officials declared a state-of-emergency, and approximately 100 square miles of land were placed under quarantine. Under industry pressures, government agencies quickly initiated the state's first medfly eradication efforts. The program involved the release of approximately 600 million sterile male medflies and the heavy use of the pesticide malathion for ground spraying. Total costs of eradication were estimated at \$1 million. Officials declared victory in August 1976, lifting the regional quarantine, ending extermination efforts, and finally announcing that the medfly had been officially eradicated from the state of California.

The California agriculture industry emerged mostly unscathed from the 1975 medfly infestation. The economic impact to producers was relatively minor, and the successful eradication efforts helped to establish government and market confidence that California could effectively address the medfly issue. As for the cost of the eradication efforts, this was paid for in joint cooperation between the state and federal governments. The industry paid nothing for the sterile medfly research and release program or the extensive pesticide treatments.

The 1980 Invasion

Following the initial infestation of 1975, California's agricultural community experienced several years of peace with regard to the medfly threat. However, this calm was not to last, and the state found itself faced with a major crisis at the start of the new decade. In 1980, medflies were detected in several counties, spanning a wide portion of the state. Monitors detected four adult flies and one medfly larva in Los Angeles. Officials responded with a declaration of a state-of-emergency, spelling the beginning of a new round of eradication efforts. These efforts consisted of the mass-release of sterile male medflies and the use of malathion in heavy ground spraying. Medflies were declared eradicated from Los Angeles in December of 1980.

Further north in California, the agriculture industry was, again, embroiled in a major struggle with the formidable pest. Hundreds of medflies were discovered over a wide range of territory. Eight counties, including Alameda, Contra Costa, Monterey, San Benito, Santa Clara, Santa Cruz, San Joaquin and San Jose were affected. The discoveries resulted in officials placing a quarantine over the region, which eventually spanned approximately 530 square miles. Eradication efforts were greatly expanded in response to the crisis. Sterile male medflies were released by the millions, and the government initiated an extensive program of malathion spraying on the ground.

This time, however, the usual eradication efforts did not appear to be working. Monitoring traps continued to turn up medflies, much to the chagrin of domestic producers and state, federal, and foreign governments. It became clear that the crisis could escalate if more serious measures were not taken. California officials responded by establishing the California Medfly Project in June 1980. This was followed by the creation of the Technical Advisory Committee, made up of members of the scientific community who would assist in the anti-medfly program efforts. These officials and committee members would soon face a barrage of political pressures from all sides, as the medfly continued its assault on California agriculture.

By November 1980, the medfly problem in Northern California had not subsided in the least. California officials responded by initiating massive efforts to strip and destroy fruits and vegetables in the affected areas, as the industry began to show signs of severe panic. Domestic producers called for more aggressive measures to combat the medfly. Adding to the tribulations of the California agriculture industry, out-of-state importers expressed deep concern over the crisis. The Japanese government indicated that it was considering the implementation of import restrictions should California be unable to solve its medfly problem. Japanese officials indicated that they would be unwilling to accept the increased domestic risk of medfly contamination from imported California produce and would be obligated to take actions accordingly. California private industry parties and governing officials agreed that this could be the beginning of a chain reaction in which other foreign governments might impose severe trade restrictions on California's produce.

As California policy makers struggled with mounting foreign pressures, the U.S. federal government expressed its alarm over the crisis. On November 24, 1980 the US Department of Agriculture (USDA) issued its decision that the current medfly eradication efforts were insufficient and called for an unprecedented program of aerial spraying of malathion. A number of state governments had already begun to exert pressures on California industry members and policy makers, indicating that the future market for California exports to their states might look increasingly grim unless appropriate measures were taken. These states supported the USDA's resolution that aerial malathion spraying was in order.

On November 27, officials from the California Department of Food and Agriculture (CDFA) met with USDA officials to discuss the increasing tensions surrounding the medfly issue. The CDFA finally announced that it was seriously

considering the implementation of an aerial spraying program over much of the quarantined area. This announcement met with staunch opposition from several city governments in the affected areas, as well as increased public interest group pressure. Members of the Technical Advisory Committee remained divided over the issue, while local governments voted to prohibit the aerial spraying program.

Faced with such a controversial decision, the CDFA agreed to postpone any aerial spraying and, instead, relied on the massive eradication efforts being conducted on the ground. Meanwhile, the California State Department of Health Services issued a report on the health issues surrounding the use of malathion. The report insisted that the pesticide was a safe and effective method for eradicating the medfly. This allayed some of the fears associated with the aerial spray program, as out-of-state pressures continued to mount over its implementation.

As 1980 came to a close, all of the parties involved waited to see if the medfly would survive the combination of the increased eradication measures and the approaching California winter. The fact that medflies cannot tolerate cold weather conditions led many scientists to speculate that the pest would not survive winter in California. However, the state is characterized by a highly desirable climate with comparatively temperate winters. As the medfly reemerged in the warmer months of 1981, it became evident that the insect could survive the less-than-brutal weather conditions in California. This discovery turned the medfly into an even greater threat, calling for effective eradication efforts to prevent it from becoming established in the state.

By July, the Technical Advisory Committee decided that aerial spraying of malathion might be a necessary step in the medfly eradication program, releasing their decision in an emergency meeting on July 7. The following day, the committee held talks with California Governor Edmund "Jerry" Brown, Jr., strongly encouraging him to initiate the controversial aerial spraying program. Faced with political pressures from all sides, Governor Brown delayed the decision and announced that the current ground based program would be intensified. This resulted in heated exchanges from all sides, as tensions mounted to their highest level since the beginning of the crisis.

The US Department of Agriculture (USDA) finally decided that more drastic measures were in order. U.S. Secretary of Agriculture John Block expressed the federal government's extreme dissatisfaction with CDFA medfly efforts, and issued the threat that, unless California initiated the malathion aerial spraying program immediately, the USDA would place a quarantine on the entire state. The announcement came on July 9, sending tremors throughout California. Less than a week later, the state governments of Florida, Mississippi, South Carolina, and Texas threatened to impose unilateral quarantines on certain California produce. Other states followed, and California quickly found itself against a wall of quarantine restrictions which could cause considerable damage to the agricultural industry.

Shortly thereafter, foreign government officials claimed that they had seen enough as well. Both Japan and Mexico threatened to impose severe trade restrictions on much of California's produce exports. Japanese officials were adamant that the California eradication and internal quarantine procedures were unacceptable, and that unless the state could handle its medfly problem, the produce export industry to Japan would remain in extreme peril.

Thus, California officials conducted lengthy discussions over the possibility of intensified internal quarantine measures. In conjunction with the expressed concerns of the federal, state and foreign governments, CDFA officials engaged in extensive negotiations on expanding the medfly eradication program. In addition to the ground efforts, officials suggested a new set of guidelines involving both aerial pesticide spraying and post-harvest treatment of exported crops. The proposed post-harvest measures included mandatory produce fumigation treatments using one of two extremely potent pesticides, methyl bromide or ethylene dibromide. These pesticides had the advantage of being both penetrating and extremely lethal to any insect life in the produce. However, methyl bromide damaged some of the fumigated fruits and vegetables, reducing the market value of the crop. And although ethylene dibromide caused little damage to the fumigated produce, this pesticide's use was to be phased out by 1983.

Another element of the proposed post-harvest treatment program involved placing export produce into cold storage for up to ten days prior to preparation for shipping. This control method would prove particularly effective, as medflies would not be able to endure the extended periods of low temperature exposure. The drawbacks of such an approach would be the tremendous expense of constructing cold storage facilities to house all of the produce to be exported. Seasonal fluctuations in the amount of produce harvests created additional cost concerns. There would have to be ample storage to accommodate produce exports from the rich summer harvests, while many of the storage facilities would lie unused during the less productive periods. The extensive use of cold storage would involve both high initial production costs, and continuing maintenance and operation expenses.

Under the new proposed quarantine treatment procedures, all export crops would be submitted to both fumigation and cold storage prior to shipping to out-of-state destinations. This process would virtually eliminate the threat of inadvertently transporting medfly-infested produce across borders. However, some interest groups raised concerns as to the safety of the current and newly proposed plant quarantine program. Parties feared that the extensive use of malathion would not only inflict severe environmental damage, but could potentially render the food products unsafe. Coupled with the newly proposed use of the notoriously potent pesticides, methyl bromide and ethylene dibromide, critics suggested that these programs used to address the medfly problem might entail significant health risks. Thus, California officials were faced with the unique dilemma of how to satisfy the concerns of the domestic industry while simultaneously determining how to respond to the restrictive pressures from foreign governments and increasingly powerful interest groups.

Governor Brown was obligated to release his decision over the medfly issue on July 10, with the health of the California agriculture industry hanging in the balance. Public interest groups indicated that they would pursue measures to impeach the governor should he decide in favor of the aerial pesticide spraying program, while industry and government parties insisted that it was necessary to preserve the produce export market. As the medfly crisis intensified, the governor struggled to reach his all-important decision on how best to handle the political and economic dilemma.

Study Questions

- 1) Who are the important parties in the medfly controversy?
- 2) Define the political, economic, and/or social interests of each of the involved parties.
- 3) Define the policy instruments available to each party in pursuing their agenda.
- 4) Propose alternative strategies for achieving consensus on the Medfly problem.
- 5) What viable policy options can be implemented by California policy makers?

CASE STUDY B: THE CHANGING CLIMATE OF THE MEDFLY CONTROVERSY

THE END OF THE '80s CRISIS

Introduction

In the wake of the intense political pressures that characterized the medfly debate, California's Governor Brown released his decision on the eradication efforts on July 10, 1981. He declared that the state would commence with an aggressive aerial spraying program of the pesticide malathion, as a necessary step to preserve the state's agricultural economy. Helicopters began spraying during the early morning hours of July 14, performing their missions from a secret landing base set up in a cemetery.

Shortly after this initial application, officials launched an all-out aerial assault on the medfly, using aircraft to spray malathion over an area of approximately 1500 square miles. Much of this territory included residential areas. In addition, the state adopted the other proposed harsh quarantine measures in an attempt to preserve California's produce export market. In response to the state's pest control problems, several U.S. states, including Texas and Florida, and the foreign governments of Japan and Mexico placed trade restrictions on California produce imports during the weeks following the governor's announcement. California officials and the domestic industry braced to see if

the intensified eradication efforts would eliminate the medfly and save them from the economic peril.

By 1982, it appeared that the eradication efforts were indeed successful in eliminating the destructive pest. Only two medflies were discovered during 1982. As a result of the state adopting the strict quarantine measures, the industry was spared from lasting export restrictions. Finally in September 1982, supported by scientific evidence, the USDA and CDFA declared the medfly to be effectively eradicated from the state of California. The victory came at a significant cost. Officials estimated that the total expenditures for eradication efforts alone amounted to approximately \$100,000,000^[iii]. With this announcement of victory over the medfly, all eradication efforts and quarantine procedures were halted, the state industry slowly resumed its normal operations.

Following the crisis of the early 80s, the medfly made periodic appearances in California. In 1984, two medflies were discovered in baited traps. However, it appeared that these were isolated incidents, which did not suggest a medfly infestation. Two more were discovered in 1986, sparking renewed concern over the volatile issue. Then in 1987, the medfly made its presence felt in much greater numbers, resulting in the regional quarantine of the Los Angeles area and renewed aerial application of malathion. 1988 proved just as problematic, with the discovery of 54 medflies in the Los Angeles area. This resulted in further area quarantines and continued aerial pesticide spraying.

THE MEDFLY CONTROVERSY IN THE 1990's

The medfly problem escalated in the 1990's. From 1989 to 1994, medflies were discovered every year in several areas. 1989 was the year in which the most medflies were ever found in California, totaling 260. On July 20, 1990, one wild Medfly was discovered in a trap near Dodger Stadium in Los Angeles. The discovery prompted an eradication program that grew to encompass 21 treatments in Los Angeles, Orange, San Bernardino, and Riverside counties. 536 six square miles received aerial applications of malathion bait. On November 8, 1990, the CDFA secretary officially ended the eradication program and quarantine.

In 1991 one wild Medfly was found near the Koreatown area of Los Angeles. An additional wild Medfly was found about 15 miles to the east of San Gabriel. Eradication methods used included high density yellow panel trapping, ground malathion and bait sprays of all properties within 200 meters of each find, and sterile medfly releases over a 26-square mile area at a rate of approximately 30 million per week between October 1991 and August 1992.

In 1992 and 1993, 202 wild Medflies were found in Pasadena, Jefferson Park, Duarte, Inglewood and Griffith Park. Consequently, eradication responses were initiated around all multiple finds. The methods used included intensive trapping, ground malathion and bait treatments, and sterile medfly releases.

In 1993, one mated female Medfly was discovered in Corona, Riverside County. Trapping and ground application of malathion bait began. On January 21, 1994, Governor Pete Wilson issued an emergency declaration authorizing the state government to do everything necessary to alleviate the infestation. Eight aerial applications of malathion bait and intensive trapping followed. On July 5, 1994, the CDFA secretary declared eradication and lifted the agricultural quarantine in Corona.

In March of 1994, following the recommendations of the International Scientific Advisory Panel, CDFA began a basin-wide sterile Medfly release program over a 1,464-square-mile area in Los Angeles, Orange, and San Bernardino counties. The program released a total of 250,000 sterile flies per square mile per week over the entire area, and released an additional 250,000 sterile flies over those areas where wild flies were found in 1994 (core areas). The program was completed in March of 1996.

After finding two mated female Medflies in Ventura County in 1994, an aerial malathion and bait treatment program in the Camarillo area of Ventura County was initiated on October 6, 1994. Fourteen aerial applications were completed in a 16-square-mile area, the last occurring on May 23, 1995. On August 1, 1995, after ten months of treatment, the CDFA secretary lifted the agricultural quarantine in Camarillo.

Economic Impact

As the Medfly became a more frequent visitor to California, the concern for the economic ramifications continued to grow. In 1991, James Siebert and Vijay Pradhan, agricultural economists at the University of California at Berkeley, conducted a study analyzing the economic impact of the Medfly on California agriculture. It was based on a 1981 study and focused on many of the same areas in determining the costs of dealing with Medfly infestations. Primarily, the expenses incurred through damaged produce, Medfly control, and post-harvest quarantine were estimated.

The CDFA, in 1990, identified 35 commodities as possible Medfly hosts. If accurate, the Medfly could have potentially affected \$6.528 billion worth of California produce, of which \$1.708 billion was to be exported.⁴^[iv] The impact on the value of production and export markets, therefore, was definitely significant. (see Appendix C)

Facing such tremendous losses, California officials recognized the need to address Medfly infestations. One method utilized was that of controlling it while the produce was still in the fields. The total field costs, including the expense of the pesticides as well as that of their application, were estimated to range from \$349.6 million to \$731.9 million.⁵^[v] (see Appendices D and E)

An alternative to the sole use of pesticides, known as Integrated Pest Management, combined the use of non-pesticidal methods of control with *limited* use of

pesticides. This practice became prevalent in the 1980's and could not be overlooked when discussing the costs of controlling the Medfly. However, calculating the actual costs of this program during that time was difficult as the strategic combinations were as varied as the numbers of growers and crops were.

Even with these efforts, controlling the Medfly was not guaranteed. Therefore, included in the 1991 study, were the estimated costs of a post-harvest quarantine system. The two options for treatment were the use of methyl-bromide and cold storage. These, however, were not without their own negative consequences: shortened shelf-life and deterioration of produce quality; costs incurred in upgrading or building new facilities; and increased transportation costs to and from quarantine sites.

The total expenses of this post-harvest treatment were estimated, in 1991, to be \$109.5 million. Another \$25.7 million was the estimated damage resulting from the treatment. In total, the quarantine phase was expected to cost \$135.3 million.⁶^[vi] (see Appendix F)

A New Twist to the Medfly Problem

By 1994, Japan had had enough. The consistent and seemingly worsening

occurrences of medfly attacks in California caused Japan to threaten an embargo on California fruits, based on which fruits were affected. The embargo never occurred, as the Japanese government was satisfied with the CDFR's eradication methods, but the threat was a symptom of an increasingly serious problem for California growers.

The Medfly problem in the 1990s was aggravated further when in 1990 James Carey, an entomologist at the University of California Davis, went before a session of the California State Assembly and presented his theory that the medfly was already established in California and had become a permanent resident⁷^[vii]. Carey proposed that the medfly appearances experienced in the 1980's were not isolated events but rather reappearances of the same small population established in California.

According to Carey, the medfly probably first came to California before the turn of the century, but the population was so small that it took until 1975, when the first medfly was discovered in California, to become detectable. Since that first sighting in 1975, the medfly has appeared every year from 1980 to 1994, except for 1983 and 1985, and the areas in which it has appeared have widened every year. Carey sees this as evidence the already established medfly population is slowly spreading north and east across California in a relatively straight-line pattern and hindered only by mountain ranges. Carey says that "these steady, near-straight-line progressions can't be random

introductions from people carrying in infested fruit; if that were the case, there'd be medflies scattered all over the map.” Instead, new medfly outbreaks almost always appear in roughly the same neighborhoods as prior outbreaks⁸^[viii].

The California Department of Food and Agriculture has continuously maintained that each appearance of the medfly is an isolated incident and that it keeps being reintroduced to California by people shipping or carrying in infested fruit illegally. Hawaii has been sited as a major source of infested fruit. However, a small group of entomologists from Florida to Hawaii have conducted tests in which they study the DNA of medflies captured in California and compare them to the DNA of medflies from areas where the medfly is already established to determine their origin. They do this by looking for a banding pattern that would differentiate populations by country or region. They use an enzyme that cuts the mtDNA every six base pairs. In one particular analysis of 14 banding patterns, they distinguished two distinctive haplotypes in their medfly samples. Those from Hawaii and Venezuela exhibited one haplotype, whereas samples for Argentina, California, and Guatemala showed the alternate haplotype. That the Hawaiian haplotype was not present in the California medfly provides strong evidence that Hawaii was not the geographic source of the California infestations⁹^[ix]. This finding also supports Carey's theory that the medfly population came from South America back in the nineteenth century.

In addition, Carey notes that when USDA Plant Protection and Quarantine personnel inspected baggage coming into major international airports in the period 1985 through July 1990, relatively few medflies were discovered. In fact, there were only five medfly interceptions in all three California international airports during the 5-to 6-year period: four in Los Angeles, one in San Francisco, and none in San Diego. Yet in the same period there were over 4000 interceptions of other fruit flies¹⁰^[x]. This evidence, in addition to the results of the DNA testing, presents a strong case in support of Carey's theory.

Despite the evidence that Carey has presented, the CDFA maintains that the medfly is not a permanent resident and has not become one because of the efforts of the CDFA and the USDA to eradicate it each time it appears. Says CDFA entomologist Bob Dowell, “We believe the insect has invaded and begun to colonize, but we find it and eradicate it. That's followed by another invasion and we start all over again”¹¹^[xi]. The CDFA has every reason to maintain this position. There is a lot at stake if the medfly is officially declared a permanent resident of California.

One of the biggest concerns surrounding this issue is the welfare of the international market for California fruit, especially in Asia. The medfly is already established in many countries in Europe and South America, so there is not a threat of

losing these markets. However, it has not reached countries like Japan, Hong Kong, Korea and Taiwan. The CDFA is especially concerned about Japan, which provides the largest market for exported California produce. In 1994, the fear of losing the Japanese market became a definite possibility. Japan threatened an embargo on California produce when the medfly reappeared. The international community had been concerned about the previous medfly appearances in the late 1970's and the 1980's, but this was the first time an embargo was threatened. CDFA officials believe that Carey's theories may have contributed to this threat.

What is especially troubling to the CDFA is that since Carey first presented his theories in 1990, he has not presented any new evidence to back his theories up. But at the same time, he has caused panic in foreign markets. In the summer of 1992, assistant director to the CDFA Isi Siddiqui faced a roadblock in China, a potentially \$200 million market for California produce, based on the Chinese fear of Carey's presentation of the medfly threat.

Also at stake for the CDFA is the federal support it currently gets for medfly eradication procedures. Each time a medfly outbreak occurs, the CDFA declares it an emergency situation. This makes them eligible for additional aid from state and federal emergency funds. If the medfly were determined to be a permanent resident of California, the CDFA could no longer declare each appearance an emergency and would lose this funding. The burden would then be laid on the growers, who maintain a powerful lobbying presence in Sacramento. Carey claims that these political-economic issues influence the CDFA, so it will therefore never accept his theories.

The CDFA is also facing opposition from the residents of the affected counties in their eradication efforts as people fear the potentially severe side effects of exposure to malathion spraying. There have been reports that some people who have been exposed to malathion experienced problems in their nervous and respiratory systems. Malathion can also peel the paint off a car. In 1990, Ventura County filed an injunction against the CDFA to prevent malathion spraying, which delayed eradication and resulted in the end to the sweeping spraying of malathion by helicopters. In 1992, 10 percent of the residents in the affected areas refused to allow access to their backyards for spraying. The CDFA maintains that malathion is safe if used properly, and the reason it harms the paint on cars is because it is corn-starch based.

The medfly has been eradicated after each appearance and the threat from Japan has dissipated, but how would Japan react if the medfly residency theory were proven? Given the already strict import procedures (See Appendix A) for produce in Japan to eliminate pests that already exist in Japan, as well as the devastating effect the medfly has on fruit, it is possible that Japan would place an indefinite embargo on California fruit. Japan has already done this to some countries, such as Mexico, Brazil and Spain where the medfly is definitely established. If Japan did this, other Asian countries would be likely to follow suit. The result for California agriculture would be disastrous.

STUDY QUESTIONS

1. What impact did James Carey's theories have on the medfly issue?
2. What would be the political repercussions if the medfly were to be declared a
"permanent resident"?
- 2a) What are the unique political interests of each party involved?
3. What would you do if you were a California policy maker to preserve both
public health and industry interests?
4. What would be the logical course of action for the Japanese government?
5. What can the USTR do to prevent or counteract an export embargo by Japan
on California produce?
6. Do you think an embargo on California agriculture by Japan is feasible?

Explain your
answer.

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