



**United States
Department of
Agriculture**

Marketing and
Regulatory
Programs

Animal and
Plant Health
Inspection
Service



Citrus Greening Control Program in Florida Nurseries

Environmental Assessment, January 2006

Citrus Greening Control Program in Florida Nurseries

Environmental Assessment, January 2006

Agency Contact:

Joel Floyd
Team Leader, Planning and Preparedness
Pest Detection and Management Programs
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 137
Riverdale, MD 20737
Telephone: 301-734-5356

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact the USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW., Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Mention of companies or commercial products in this report does not imply recommendation or endorsement by the U.S. Department of Agriculture over others not mentioned. USDA neither guarantees nor warrants the standard of any product mentioned. Product names are mentioned solely to report factually on available data and to provide specific information.

This publication reports research involving pesticides. All uses of pesticides must be registered by appropriate State and/or Federal agencies before they can be recommended.

CAUTION: Pesticides can be injurious to humans, domestic animals, desirable plants, and fish or other wildlife—if they are not handled or applied properly. Use all pesticides selectively and carefully. Follow recommended practices for the disposal of surplus pesticides and pesticide containers.

Table of Contents

I. Need for Proposal	1
A. Introduction	1
B. Purpose and Need for Action	3
II. Alternatives	4
A. No Action	4
B. Proposed Action	4
III. Environmental Consequences	5
A. No Action	6
B. Proposed Action	6
IV. Agencies, Organizations, and Individuals Consulted	15

I. Need for Proposal

A. Introduction

Citrus greening is considered to be one of the most serious citrus diseases in the world. It is a bacterial disease of citrus that greatly reduces production, destroys the economic value of the fruit and can kill trees. Citrus greening is a disease vectored by two species of citrus psyllid (*Diaphorina citri* Kuwayama and *Trioza erytreae* (del Guercio)). Asian citrus psyllids cause economic damage to citrus in groves and nurseries by direct feeding and, potentially, by transmitting a serious bacterial disease. Both adults and nymphs feed on young foliage, depleting the sap and causing galling or curling of leaves. High populations feeding on a citrus shoot can kill the growing tip. More importantly, this psyllid is able to transmit an endocellular, phloem-restricted bacterium, *Liberobacter asiaticum*, that causes the greening disease. The bacteria are phloem-limited and cause yellow shoots, blotchy mottling and chlorosis, reduced foliage, and tip dieback of citrus plants.

Citrus greening, or huanglongbing, is a bacterial disease that attacks the vascular system of plants. Once infected there is no cure for a tree with citrus greening disease. In areas of the world where citrus greening is endemic, citrus trees decline and die within a few years and may never produce usable fruit. It is widespread in Asia, Africa, and the Saudi Arabian Peninsula. It has been reported in Sao Paulo, Brazil, and confirmed in August, 2005, in south Miami-Dade County in Florida. Survey work is ongoing to determine its distribution within the State. How it actually got to Florida still remains unknown.

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), in cooperation with the Florida Department of Agriculture and Consumer Services (FDACS) is proposing to implement a designed localized program to quarantine, survey, detect, and apply pesticide treatments for the control of the citrus greening disease and its vectors, found in Florida commercial nurseries. The proposed program combines a number of control methods with regulatory quarantines to control this disease and its vectors. This final environmental assessment (EA) analyzes the environmental impacts of the proposed program and its alternatives.

Under APHIS' National Environmental Policy Act (NEPA) Implementing Procedures, 7 Code of Federal Regulations (CFR) Part 372, the proposed action is a class of action for which an EA is normally prepared. This final EA considers the potential effects of the proposed action and its alternatives, including no action.

In September 2005, APHIS prepared an EA to analyze and evaluate any potential environmental effects resulting from this proposed control program. The availability of the September 2005 EA was announced in both *The Miami Herald* and *The Fort Lauderdale Sun Sentinel* on September 30, 2005. The public was requested to send in comments on the September 2005 EA by October 28, 2005. The September 30 public newspaper notices likewise informed the public that an immediate control program response to the serious citrus greening disease might be urgently needed and, thus, the control program might have to begin immediately. Thereafter, on October 5, 2005, APHIS issued a notice of availability of a Finding of No Significant Impact (FONSI) for the EA concerning the Citrus Greening Control Program in Florida nurseries and extension on the comment period. The notice of availability of the FONSI was placed in newspapers in Miami, Fort Lauderdale, West Palm Beach, Orlando, and Tampa, both in English and Spanish.

In that October 5, 2005, notice of availability of the FONSI, APHIS informed the public that it had prepared the September 2005 EA for a proposed control program to survey, detect, quarantine, remove trees, and apply pesticide treatments for the control of citrus greening disease in Florida nurseries in the following counties: Brevard, Broward, Charlotte, Citrus, Collier, DeSoto, Glades, Hardee, Hendry, Hernando, Highlands, Hillsborough, Indian River, Lake, Lee, Manatee, Marion, Martin, Miami-Dade, Monroe, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pineallas, Polk, Putnam, Sarasota, Seminole, St. Lucie, and Volusia.

APHIS also informed the public in the notice of availability of the FONSI, that, at the time, the citrus greening disease has only been detected in Miami-Dade and Broward Counties but has the real potential to rapidly spread to other Florida counties if not immediately contained. APHIS informed the public that it had determined that the treatment control response to the serious citrus greening disease infestation was urgent and that it was necessary to begin the treatment control program operations immediately in Dade and Broward Counties in order to hopefully immediately contain the infestation before it spread further. Accordingly, APHIS explained it needed to immediately proceed with the control program and, thereby, issued the FONSI for the September 2005 EA.

In that October 5, 2005, notice of availability of the FONSI, APHIS likewise informed the public that it was extending the public comment period for the September EA from October 28 until November 10, 2005. There were only two requests for copies of the September 2005 EA. As of January 6, 2006, APHIS has not received any public comments at all on the September 2005 EA.

B. Purpose and Need

This final EA has been prepared in compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321–4327 (NEPA)) and its implementing regulations. In this final EA, APHIS analyses the proposed action, namely, in response to this infestation of citrus greening disease in Florida, a localized control program in which there are established quarantine boundaries wherein there is limited movement of host material, tree removal, and chemical treatments.

The proposed control action includes all ornamental citrus psyllid host plant material, in addition to all citrus which is quarantined and prohibited from movement out of those infested counties, in Florida. The infested counties in Florida will be regulated to prevent the spread of citrus greening with several mitigating requirements. One such requirement is a compliance agreement which has been developed in conjunction with FDACS and APHIS that will include recommended controls and treatments for the citrus psyllid. These treatments will allow for commercial citrus psyllid host plant material (other than citrus) from regulated counties to be shipped within the State of Florida and to non-citrus producing States. For all other counties (those not infested), the interstate shipping (shipments outside the State of Florida) of all citrus psyllid host plants (including citrus) is permitted except to citrus producing States or U.S. Territories (American Samoa, Arizona, California, Guam, Hawaii, Northern Marianas Islands, Louisiana, Texas, Puerto Rico, and the Virgin Islands). If citrus greening is detected in additional counties, the regulations that are established for the presently infected counties will be applied.

APHIS is the Federal agency with the authority and responsibility for taking actions to exclude, prevent, eradicate, and/or control plant pests, including the citrus greening disease, under the Plant Protection Act (7 U.S.C. 7701 *et seq.*). APHIS has been delegated the authority to administer this statute and has promulgated Quarantines and Regulations (7 CFR 319) which regulate the importation of commodities and means of conveyance to help protect against the introduction and spread of harmful plant pests. APHIS and the FDACS have imposed regulations governing the movement of certain material from infested counties in Florida. These regulations and control measures, as part of the proposed localized control action, apply only to commercial nurseries at this time because it is the area that presents the most risk for spreading the disease and its vectors to other parts of the country. If control efforts are needed in groves and residential neighborhoods, further environmental analysis will be done on a proposed control action that would include those locations.

Not much is known at this time regarding the most definitively effective efforts to control the citrus greening disease although we do know the basic control methods that need to be immediately employed. To help effectively control the disease and the threat it poses to North America's citrus industry, aggressive and comprehensive research projects are underway to learn more about this pest's biology and develop appropriate management, control, and eradication options.

II. Alternatives

APHIS carefully considered the two appropriate alternatives in response to the need for better methods to immediately address and quickly respond in order to locally control and contain citrus greening disease in commercial nurseries in Florida: (1) no action, and (2) proposed action. Each alternative is described briefly in this section and the potential impacts of each are considered in the following section.

A. No Action

Under the no action alternative, APHIS would not implement any quarantine or control measures to eradicate or even attempt to locally contain the spread of citrus greening disease. Some control measures, albeit limited ones without APHIS' involvement, could be taken by other Federal or non-Federal entities; those actions would not be under APHIS' authorities, expertise, control, or funding. Absent APHIS' assistance and expertise along with the absence of more effective measures to contain and control the spread of citrus greening disease, new areas of infestations would be expected to continue and become more widespread. Local business owners and area residents could attempt to control damages from citrus greening disease by removing the infested trees from their properties. The lack of effective control measures to prevent the spread of citrus greening disease from sites of infestation to other areas and counties could lead to higher production costs and an increase in shortages of availability of citrus fruits and plants to the general economy. This would result in potentially significant additional costs for survey, detection, and treatment for the control of citrus greening disease as it spreads to other areas and counties.

B. Proposed Action

Under this proposed action (preferred alternative), APHIS would work cooperatively with the FDACS to locally quarantine the infected/infested area and to implement program control measures to contain citrus greening disease and prevent its dissemination from nurseries in Florida. Under the proposed alternative, surveys will be conducted throughout

Florida to determine if the disease exists in a particular area and to delimit the infestation. Inspectors who perform these surveys and take regulatory action will adhere to strict guidelines to ensure that disease spread to other areas does not occur.

The proposed program control measures include that commercial nurseries must treat all regulated articles for the control of psyllids with an EPA-approved product labeled for use in commercial and ornamental nurseries before moving outside the quarantine. In addition, all plants which have been treated in accordance with the required control program compliance agreement (which the commercial plant nursery must follow) with requirements, include the following: (1) must be inspected and found free of the Asian citrus psyllid within 72 hours of shipping, (2) each shipment will be certified by an authorized representative of the FDACS, (3) shipments will not be authorized for distribution to the following citrus-producing States or U.S. territories: American Samoa, Arizona, California, Guam, Hawaii, Northern Marianas Islands, Louisiana, Texas, Puerto Rico, and the Virgin Islands, (4) all regulated articles must be treated with a soil drench or foliar spray from an approved list of pesticides, and (5) any article moved out of the State must be accompanied by a PPQ Form 530 "Limited Permit."

Once a detection of citrus greening is confirmed, a quarantine "hold" will be placed on the property to prevent the removal of any greening host plants, budwood, or psyllid vector hosts. The commercial plant nursery will be required to apply a pesticide treatment as soon as possible after confirmation. These treatments are limited exclusively to commercial establishments and, therefore, exposure to the general public is precluded. Six different pesticide formulations have been proposed to control citrus greening: acetamiprid, chlorpyrifos, fenprothrin, imidacloprid, kaolin, and a cyfluthrin/imidacloprid formulation. These pesticides will be applied foliarly through the use of backpack applicators (by employees or agents of the commercial plant nursery), other ground equipment, or through soil drench by watering or dipping. The potential environmental effects are summarized for each of the pesticides below.

III. Environmental Consequences

There are potential impacts from each of the alternatives being considered. The significant pest risk from citrus greening disease is an important consideration for evaluating both alternatives. Potential program impacts arise from each of the chemical treatments; however, most of the treatment impacts are not expected to be substantial, as described below in subsequent sections. The only potential affected areas to be treated pursuant to the proposed control program are within the Florida commercial and ornamental nurseries at this time.

The analysis of potential environmental consequences possibly resulting from this proposed control program will be considered within the alternatives of no action and the preferred alternative. Under the no action alternative, APHIS will not be involved and plants will not be quarantined and infected plants may be imported to non-infected areas of Florida and the United States. The proposed alternative includes APHIS' involvement and uses insecticides to treat citrus greening. As will be analyzed and described below, each of these alternatives has the potential for adverse environmental consequences.

A. No Action

Citrus greening disease is a serious bacterial disease which greatly reduces production, destroys the economic value of the fruit, and can kill trees. It is vectored by psyllids. The Asian form of psyllid, *Diaphorina citri*, has been found throughout the citrus growing areas of Florida, although citrus greening bacterium (*Candidatus Liberibacter africanus*), has only been detected in parts of Florida. Under the no action alternative, APHIS will not be involved in any actual control or interstate plant quarantine measures and, thus, plants that contain citrus greening may be sent to other parts of Florida and even shipped or moved interstate to other States within the United States allowing for the spread of citrus greening to these areas. If established in other counties throughout Florida and/or other States, significant pesticide use by individuals and organizations would be required to try to control the spread of citrus greening and such significant pesticide usage may cause substantial environmental impacts which would significantly exceed those limited environmental impacts of the proposed alternative.

B. Proposed Action

APHIS will be involved in the actual proposed control program measures described above which include regulations and required compliance agreement restrictions and conditions. The required aspects of the proposed control program, which includes routine surveys, quarantines, and inspections of commercial nurseries, are program activities that pose very negligible environmental effects that need not be described in detail. Such "routine" control measures are specifically designated as "categorically excluded" activities and actions pursuant to APHIS' NEPA implementing regulations (7 CFR § 372.5(c)(1)). The primary program control action in this proposed control program that could be associated with any potentially noteworthy environmental impacts is the use of chemical control measures which are discussed further in this section.

1. Chemical Control

a. Acetamiprid

Human Health

Acetamiprid is a systemic, chloro-nicotinyl insecticide chemically related to the tobacco toxin nicotine. The mode of toxic action is unique and works by interfering with the transmission of stimuli in the insect's nervous system. Specifically, it causes a blockage in a type of neuronal pathway (nicotinic) that is more abundant in insects than in warm-blooded animals. Because of their molecular shape, size, and charge, nicotine and nicotinoids fit into receptor molecules in the nervous system that normally receive the molecule acetylcholine. This molecule carries nerve impulses from one nerve cell to another or from a nerve cell to the tissue that a nerve controls. Acetamiprid overstimulates the nerve, ultimately resulting in the insect's paralysis and eventual death. Since this nicotinic site of action is more prevalent in insects than in higher organisms, the pesticide is selectively more toxic to insects. Signs and symptoms in humans include fatigue, twitching, cramps, and muscle weakness, including the muscles for breathing. Acetamiprid is classified as an "unlikely" human carcinogen by EPA.

The application of this pesticide is limited to treatments of nursery stock. None of the routine or extreme exposure scenarios pose unacceptable risks to workers or applicators. Moreover, required protective gear and safety precautions further ensure that no adverse effects to program workers can be expected.

Non-target Organisms

The program use of acetamiprid for treatment of nursery stock is unlikely to impact most non-target wildlife. Acetamiprid is moderately toxic to birds and mammals. However, the area affected by the pesticide will be limited to nurseries and should only affect a limited number of birds, if any at all. Although it is nontoxic to fish, it is slightly to highly toxic to certain aquatic invertebrates. Adherence to label and program application restrictions should preclude any drift or runoff to water. Some terrestrial invertebrates (particularly some insects) will have a high mortality rate, but is unlikely to exceed that of other pesticides currently in use in nurseries. Acetamiprid is only moderately toxic to bees. Acetamiprid does not pose any risks of bioaccumulation in fish or organic sediments.

Environmental Quality

Any effects of acetamiprid to the quality of the air, soil, and water will be of no consequence and of limited time duration. Acetamiprid is highly soluble in water and will dissipate quickly. It is absorbed by soil particles, but is readily degraded by aerobic soil metabolism. The low application rate and rapid degradation preclude any potential for soil mobility. Acetamiprid is readily taken up by plants and translocated, but the program treatments are not expected to result in any bioaccumulation hazards due to rapid degradation.

b. Chlorpyrifos

Human Health

Chlorpyrifos is an organophosphate insecticide that can cause neurotoxic effects. The toxicity of chlorpyrifos occurs primarily through the inhibition of acetylcholinesterase enzyme activity which permits the transmission of nerve impulses across the nerve synapse. Signs and symptoms of low doses include localized effects (such as nosebleeds, blurred vision, and bronchial constriction) and systemic effects (such as nausea, sweating, dizziness, and muscular weakness). At higher doses the signs and symptoms include irregular heartbeat, elevated blood pressure, cramps, and convulsions. Chlorpyrifos is not considered carcinogenic based upon studies acceptable to EPA.

The application of this pesticide is limited to treatment of nursery stock, therefore, the only individuals that may be affected by the use of this insecticide are the nursery workers and the occupational workers who apply the pesticide. Several chlorpyrifos scenarios (such as backpack applicators, hydraulic rig applicators, and ground personnel) do exceed the maximum acceptable exposure that poses no evident risk to human health (Regulatory Reference Value or RRV) when proper safety precautions are not taken and protective gear is not worn. However, this elevated risk is not life-threatening. Protective gear and safety precautions required by label adherence and standard program operating procedures are designed to ensure that no adverse effects to program workers can be expected.

Non-target Organisms

The program use of chlorpyrifos for treatment of nursery stock is unlikely to impact most non-target wildlife. Chlorpyrifos has a moderate toxicity to mammals when consumed. It can be moderately toxic to birds, and severely toxic to some individual bird species. However, mammals and

birds will generally not be in the affected area at the time of spraying. Symptoms of non-fatal exposure to birds include cholinesterase depression (ChE), weight loss, reduced egg production, and reduced hatchling survival. It is severely toxic to terrestrial invertebrates such as earthworms and worker honeybees; however, this effect is not uncommon to other pesticides which are currently being used in nurseries. Chlorpyrifos can be severely toxic to fish and aquatic invertebrates. However, the label forbids direct application to water. Residues from drift or runoff are not anticipated to pose substantial risks to these species.

Environmental Quality

Any effects of chlorpyrifos to the quality of the air, soil, and water will be of no consequence and of limited time duration. Chlorpyrifos can persist in soil and water for several months under certain conditions, however, the persistence is generally only for a month or less. This is dependent on the organic content of the soil. Nevertheless, it can remain in silt which can runoff or drift to surface waters. Potential bioaccumulation in aquatic organisms could be of concern if applications have much drift to water bodies. Residues may persist on treated vegetation, but are not anticipated to pose bioaccumulation hazards.

c. Fenpropathrin

Human Health

Fenpropathrin is a synthetic pyrethroid insecticide which affects the nervous system. It is a moderate skin irritant and eye irritant. Signs and symptoms can include muscle contractions, tremors, ataxia, and nerve paralysis at moderate to high levels of exposure. Fenpropathrin is not considered carcinogenic by EPA.

The application of this pesticide is limited to nursery stock. Potential pesticide exposures are limited to nursery workers and the occupational workers who apply the pesticide. Backpack spray application and hydraulic rig applications for the extreme exposure scenario are the only scenarios that exceed the RRV. The extreme exposure scenario presumes that the worker will be exposed to higher quantities of the pesticide when that individual is not following safety protocols or wearing protective gear. Protective gear and safety precautions required by label adherence and standard program operating procedures are designed to ensure that no adverse effects to program workers can be expected.

Non-target Organisms

The program use of fenpropathrin for treatment of nursery stock is unlikely to impact most non-target wildlife. The toxicity of fenpropathrin is moderate to mammals and has a slight oral toxicity to birds and terrestrial stages of reptiles and amphibians. There is a high risk for exposed shrews and bats; however, given the limited use in this program, shrews and bats are unlikely to be located in the affected area. It is highly toxic to most aquatic organisms. Nevertheless, aquatic organisms will most likely not be affected because the limited area of application within the nursery should not pose any risk of drift or runoff to waters which contain aquatic organisms. Terrestrial invertebrates will have a high mortality rate, but this is unlikely to exceed that of other pesticides currently in use in the nurseries.

Environmental Quality

Any effects of fenpropathrin to the quality of the air, soil, and water will be of no consequence and of limited time duration. Fenpropathrin has low water solubility but can be persistent in water for up to 245 days. It adheres to soil particles easily and generally is not persistent for more than 2 weeks. Residues on treated vegetation are also of short persistence.

d. Imidacloprid

Human Health

Imidacloprid is a systemic, chloro-nicotinyl insecticide chemically related to the tobacco toxin nicotine. The mode of toxic action is unique and works by interfering with the transmission of stimuli in the insect's nervous system. Specifically, it causes a blockage in a type of neuronal pathway (nicotineric) that is more abundant in insects than in warm-blooded animals. Because of their molecular shape, size, and charge, nicotine and nicotinoids fit into receptor molecules in the nervous system that normally receive the molecule acetylcholine. This molecule carries nerve impulses from one nerve cell to another or from a nerve cell to the tissue that a nerve controls. Imidacloprid overstimulates the nerve, ultimately resulting in the insect's paralysis and eventual death. Since this nicotineric site of action is more prevalent in insects than in higher organisms, the pesticide is selectively more toxic to insects. Signs and symptoms in humans include fatigue, twitching, cramps, and muscle weakness, including the muscles for breathing. Imidacloprid is not considered carcinogenic by EPA. The application of this pesticide is limited to treatments of nursery stock. Imidacloprid is the least toxic of the systemic program pesticides. None of the routine or extreme

exposure scenarios pose unacceptable risks to workers or applicators. Moreover, required protective gear and safety precautions further ensure that no adverse effects to program workers can be expected.

Non-target Organisms

The program use of imidacloprid for treatment of nursery stock is unlikely to impact most nontarget wildlife. Imidacloprid is moderately to severely toxic to birds including, but not limited to, American robin, northern mockingbird, European starling, red-winged blackbird, and house sparrow. However, the area affected by the pesticide will be limited to nurseries and should only affect a limited number of birds, if any at all. Although it is nontoxic to fish, it is highly toxic to aquatic insects. Adherence to label and program application restrictions should preclude any drift or runoff to water. Terrestrial invertebrates will have a high mortality rate, but is unlikely to exceed that of other pesticides currently in use in nurseries.

Environmental Quality

Any effects of imidacloprid to the quality of the air, soil, and water will be of no consequence and of limited time duration. Imidacloprid is moderately soluble in water and will dissipate quickly. It is absorbed by soil particles and has low mobility. Imidacloprid is readily taken up by plants and translocated, but the program treatments are not expected to result in any bioaccumulation hazards.

e. Kaolin

Human Health

Kaolin is a colloidal suspension in water that is applied as a wettable powder to coat and protect leaf surfaces from insect damage. It is a mild to moderate skin and eye irritant. Prolonged or repeated exposure to lungs may cause pulmonary disorders and aggravate allergies. There are no known carcinogenic effects associated with the use of this pesticide as determined by EPA. The application of this pesticide is limited to commercial and ornamental nursery stock. Other than limited dermal and respiratory irritation, there are few hazards to workers exposed to kaolin. Moreover, required protective gear and safety precautions are designed to ensure that no adverse effects to program workers can be expected.

Non-target Organisms

The toxicity of kaolin is low in mammals, birds, reptiles, and amphibians. There is a small concern that some developmental life stages of birds,

such as the egg, are at risk from exposure; however, this is unlikely since birds nests aren't generally found in nurseries. It is highly toxic to most life stages of terrestrial invertebrates but risks are comparable to other pesticides routinely used in nurseries. Fish and aquatic invertebrates were not examined because the application of this insecticide is applied directly to the plant and there is very little likelihood of kaolin transport to water bodies.

Environmental Quality

Any effects of kaolin to the quality of the air, soil, and water will be of no consequence. Kaolin is a mineral oil that is expected to persist on treated surface until removed by weathering or leaf fall. The label restricts application to locations other than water or where surface water is present. Any kaolin that drifts onto soil will adhere to the soil particles and degrade with weathering.

f. Cyfluthrin/Imidacloprid Mixture

Human Health

Cyfluthrin is a synthetic pyrethroid insecticide which affects the nervous system in a manner similar to fenpropathrin. Imidacloprid is a systemic, chloro-nicotinyl insecticide whose mode of toxic action and toxicity have already been described. Cyfluthrin is not considered to be an eye irritant or skin sensitizer. Signs and symptoms can include muscle contractions, tremors, ataxia, and nerve paralysis at moderate to high levels of exposure. Cyfluthrin is not considered to be carcinogenic, mutagenic or teratogenic by EPA. The difference in mechanism of toxic action ensures that this mixture does not pose increased toxicity through synergistic action. Although synergistic effects on toxicity are possible with simultaneous exposure to organophosphates (such as chlorpyrifos) and cyfluthrin, this type of exposure is unlikely with the safety precautions required of this program. The application of this pesticide is limited to treatments of nursery stock. None of the routine or extreme exposure scenarios from this mixture pose unacceptable risks to workers or applicators. Moreover, required protective gear and safety precautions further ensure that no adverse effects to program workers can be expected.

Non-target Organisms

The program use of this mixture for treatment of nursery stock is unlikely to impact most non-target wildlife. Although imidacloprid is moderately to severely toxic to some songbirds and cyfluthrin poses some risks to

small mammals, the applications to nursery stock are not expected to pose high risks because of the limited exposure potential. Although the mixture poses toxicity to fish and most aquatic organisms, adherence to label and program application restrictions should preclude any drift or runoff to water. Terrestrial invertebrates will have a high mortality rate, but is unlikely to exceed that of other pesticides currently in use in nurseries.

Environmental Quality

Any effects of this formulation to the quality of the air, soil, and water will be of no consequence and of limited time duration. Although cyfluthrin is of low water solubility and adsorbs readily to organic matter, it is not as persistent as chlorpyrifos in soil. Imidacloprid is moderately soluble in water and dissipates quickly. It is also absorbed by soil particles and has low mobility. Both compounds are readily taken up by plants and translocated, but the program treatments are not expected to result in any bioaccumulation hazards.

2. Other Issues Evaluated

a. Threatened and Endangered Species

APHIS examined and determined what, if any, of the proposed control measures that would be required to be used or employed in reference to their compliance with the Endangered Species Act (ESA) of 1973. Section 7 of the ESA and its implementing regulations require Federal agencies to insure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of critical habitat. APHIS has considered the aspects, including quarantine, survey, and insecticide treatments in commercial nurseries.

APHIS has prepared a biological assessment to determine if the proposed control program could have the potential to likely jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of their critical habitat in 32 Florida counties. Based upon the findings of that analysis, APHIS has determined that the proposed program for control of citrus greening in Florida will have no effect on federally-listed threatened and endangered species and will not adversely modify designated critical habitat.

b. Minority Populations and Low-income Populations

Consistent with Executive Order (E.O.) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations," APHIS considered the potential for the proposed control measures to have any disproportionately high and adverse human health

or environmental effects on any minority populations and low-income populations. APHIS has determined that the environmental and human health effects from the proposed applications are minimal and are not expected to have disproportionate adverse effects to any minority or low-income populations because it is only being applied inside commercial and ornamental nurseries and, therefore, there is very little to no potential for any effects from the control measures done inside the commercial nurseries to have any effects that could affect minority or low-income populations.

c. Protection of Children

Consistent with E.O. 13045, "Protection of Children From Environmental Health Risks and Safety Risks," APHIS considered the potential for disproportionately high and adverse environmental health and safety risks to children resulting from the proposed control measures. The proposed program applications to control citrus greening are only made within commercial and ornamental nurseries, therefore, no exposure to children is expected to occur. It will be the responsibility and obligation of the program pesticide applicators (either employees of the commercial plant nursery or hired by the commercial plant nursery to do the pesticide applications) to ensure that the general public is not in or around areas being treated, therefore, no exposure will occur during the application process. The only possible exposure would be to the applicator and nursery workers when not following the prescribed label use and safety directions. Therefore, it was determined that no disproportionate effects to children are anticipated as a consequence of implementing the preferred alternative.

IV. Agencies, Organizations, and Individuals Consulted

This final EA was prepared and reviewed by APHIS. The addresses of participating APHIS units, cooperators, and consultants (as applicable) follow.

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine
Pest Detection and Management Programs
4700 River Road, Unit 134
Riverdale, MD 20737-1236

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine
Environmental Monitoring Team
4700 River Road, Unit 150
Riverdale, MD 20737

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Policy and Program Development
Environmental Services
4700 River Road, Unit 149
Riverdale, MD 20737-1238

Florida Department of Agriculture and Consumer Services
Division of Plant Industry
website at: <http://www.doacs.fl.us/pi/enpp/ent/citrusgreening.html> .

U.S. Environmental Protection Agency, Office of Pesticide Programs,
1995. Imidacloprid; pesticide tolerances. Federal Register (July 5) 60
(128): 34943-34945.

U.S. EPA, OPP—See U.S. Environmental Protection Agency, Office of
Pesticide Programs.