DEPARTMENT OF FOOD AND
AGRICULTURE PROPOSED CHANGES IN
THE REGULATIONS
3 CCR § 3591.34
Guava Root-Knot Nematode
Eradication Area
INITIAL STATEMENT OF
REASONS/ POLICY STATEMENT
OVERVIEW

The California Department of Food and Agriculture (Department) proposes to adopt Title 3 California Code of Regulations (CCR) Section 3591.34 Guava Root-Knot Nematode Eradication. These regulations will allow the Department to create a statewide eradication area for guava root-knot nematode which will help prevent the spread of guava root-knot nematode (*Meloidogyne enterolobii*) within California should it be detected within the state.

Description of Public Problem, Administration Requirement, or Other Condition or Circumstance the Regulation is Intended to Address

This regulation is intended to address the obligation of the Secretary of Food and Agriculture to protect the agricultural industry of California from the movement and spread within California of injurious plant pests as required by Food and Agricultural Code (FAC) Sections 401 and 403.

Purpose and Factual Basis

Guava root-knot nematode, *Meloidogyne enterolobii*, is considered one of the most important pathogenic nematode species because of its ability to overcome the plant genes that provide resistance to the many other *Meloidogyne* spp. in important crops, thereby causing much greater damage and a substantial reduction in crop yields.

Guava root-knot nematode is a root-knot nematode with a life cycle and feeding

behavior similar to other root-knot nematode species. It is a sedentary endoparasite that feeds within host plant roots. Adult females, embedded in host roots produce eggs within a gelatinous matrix either on the surface of, or within roots. The first stage juvenile develops within the egg and molts to develop into the second stage juveniles (J2). The J2 is the infective stage that hatch from eggs, migrate in rhizosphere soil, and infest the roots of the host plants. Within roots, J2s establish a specialized feeding site called 'giant cells,' which are responsible for the characteristic galls found on infected root systems. In the J2, the nematodes become sedentary while feeding at the giant cells, increase in size, and undergoing two more molts before developing into mature adult females or males. Although males are present, reproduction is by mitotic parthenogenesis, where mating and genetic recombination do not occur. Generally, the life cycle for root-knot nematodes takes about 30 days at 25-28°C and can be longer at lower temperatures.

The hosts of guava root-knot nematode include many important economic plants that are grown in California. The annual value of potentially impacted hosts in California include lettuce (*Lactuca sativa*; $3.9B), pepper (*Capsicum annuum*; $343M), watermelon (*Citrullus lanatus*; $155M), coffee (*Coffea arabica*), soybean (*Glycine max*), sweet potato (*Ipomoea batatas*; $289M), tobacco (*Nicotiana tabacum*), guava (*Psidium guajava*), tomato (*Solanum lycopersicum*; $2.01B), eggplant (*S. melongena*), cotton (*Gossypium* spp; $464M), cucumber (*Cucumis sativus;* $34.3M), celery (*Apium graveolens*; $362M), cabbage (*Brassica oleracea* var. *oleracea*; $353M), garden beet (*Beta vulgaris*), squash (*Cucurbita* spp; $50M), potato (*Solanum tuberosum*; $348M), and sweet basil (*Ocimum basilicum*). Minor hosts include garden and houseplants such as Angelonia (*Angelonia angustifolia*), angel's trumpet (*Brugmansia* spp.), ear pod tree (*Enterolobium contortisiliquum*), Jamaican pointsettia (*Euphorbia punicea*), hibiscus (*Hibiscus* spp.), prayer plant (*Maranta arundinacea*), noni (*Morinda citrifolia*), *black mulberry (Morus nigra*), princess tree (*Paulownia* elongata), clove tree (*Syzygium aromaticum*), clock vine (*Thunbergia* spp.), princess flower (*Tibouchina* spp.), tickseed (*Bidens Pilosa*). Several weed plants have also been reported as hosts for the guava root-knot nematode. These weeds can serve as reservoirs for infection of crops and increase nematode numbers

and spread in soil.

Currently, the states of Florida, Georgia, Louisiana, North Carolina, and South Carolina have areas under quarantine for guava root-knot nematode. Previously, it was unknown whether this nematode had already entered the state undetected, as prior to 2005 *Meloidogyne* spp. samples were not reliably identified at the CDFA Nematology Laboratory to species level when detected in samples that originated outside and within California. However, since 2005, guava root-knot nematode has never been detected in California-origin regulatory samples generated through CDFA's nematode control and phytosanitary certification programs or statewide nematode surveys of host plants grown in agricultural production sites and nurseries in California. Also, guava root-knot nematode has not been reported from California by other researchers/nematologists in the gray or peer-reviewed literature. Due to the wide host range, this species could establish itself within California. That California has so far avoided infestation where other states have not is a testament to the effectiveness of California's Pest Prevention System. This underscores the importance of establishing protocols for eradication and response if and when guava root-knot nematode is detected in California.

Because of the way in which sweet potatoes propagules are imported from guava root-knot nematode infested areas, they represent the most likely host pathway for guava root-knot nematode to enter California. In order to demonstrate that California currently is free from guava root-knot nematode, survey of California sweet potatoes was conducted by the Department between July 1, 2023, and June 30, 2024. A total of 375 samples from actively growing fields were collected from Merced, Kern, and Stanislaus counties. All samples were diagnosed by State Nematologists at CDFA's Pest Diagnostics Center at Meadowview. This survey represented close to 15% of the State's sweet potato acreage. All samples proved negative for guava root-knot nematode. As guava root-knot nematode does not currently occur in the state, it is critical to protect California agriculture and environment from the introduction of this pest.

If guava root-knot nematode were introduced into California, many agricultural industries

would be severely impacted due to decreased yields. There would be rising costs associated with crop rotations, and increased pesticide use. Also, if this pest were introduced, there would be a possible loss of markets if other states or counties established quarantines against California agricultural products due to this pest. Several ornamental and perennial shrub plants are known or probable hosts of the nematode species. Infestations of guava root-knot nematode may lower biodiversity, disrupt natural plant communities, and endanger critical habitats. Home gardening and ornamental plantings may also be impacted. Therefore, it is necessary to add Section 3591.34 to allow for establishing an eradication area against guava root-knot nematode.

Project Descriptions

This regulation will provide authority for the State to perform specific eradication and management activities against the guava root-knot nematode in California. This authority includes restricting entry of hosts and potential carriers and requiring certifications.

(a) Pest

Section (a) defines the pest for which regulation 3591.34 proposes to establish a statewide eradication area is detected. The pest is guava root-knot nematode, a nematode not currently found in California. The nematode has the ability to establish itself in the state due to many potential agricultural hosts, which would cause harm to the agricultural industry.

Section (b) Articles and Commodities Covered

The following articles and commodities arehosts for the guava root-knot nematode and are therefore part of any eradication area:

- All earth including potting media, sand, and soil,
- All plants with roots and other below-ground plant parts,
- All rooted plant cuttings for propagation, and
- All soil and below-ground plant debris, including farming equipment.

The pest moves through infested roots and soil. Restricted movement of these articles and commodities will prevent this route of infestation.

Exemptions from the eradication areas are the following articles and commodities that do not provide opportunities to be contaminated by guava root-knot nematode. By identifying these exemptions, the Department can apply its resources to areas with potential risks of infestation, while avoiding needless curtailment of commerce.

- Industrial sand and clay, high-purity products with uniform particle sizes, because it does not provide material for guava root-knot nematode to infest
- Air plants if grown in or on soil-free material because without soil and roots there is no potential for guava root-knot nematode infestation.
- Aquatic plants grown in soil-free environments, or aquatic plants without soil, because they do not provide any opportunity for guava root-knot nematode infestation.
- Plants secured by air-layering if roots are established and enclosed in the original soil-free moss wrapping, without soil, because there is no potential for guava root-knot nematode to infest and air layer roots allow for visual inspection.
- Cuttings taken at least 12 inches above ground level because without soil and roots there is no potential for guava root-knot nematode to infest. Twelve inches is the distance above which the chance of adherence of guava root-knot nematode from splashed muddy water is seen to be quite low.
- All fleshy roots, corms, tubers, and rhizomes only for edible or medicinal purposes if washed or otherwise freed of soil and not for propagation there will be no opportunity for guava root-knot nematode to establish in California as these do not provide material for guava root-knot nematode to infest.

Section (c) Means and Methods

This section lists the means and methods that can be used for eradication, control or suppression of guava root-knot nematode, it’s hosts, and any possible carriers within California.

Section (c)(1) allows for the repeated timely application of soil fumigation of articles or things which are infested or exposed to infestation and capable of harboring or spreading guava root-knot nematode. These actions can destroy the pest and stop infestation from spreading.

Section (c)(2) allows for the removal and destruction of any and all possible carriers. By removing host material, the pest's movement can be limited and the life cycle interrupted, preventing further spread and infestation.

Section (c)(3) allows for the removal and destruction of abandoned or unwanted hosts or possible carriers bearing or capable of bearing guava root-knot nematode. By removing hosts and carriers, the potential areas for this pest to infest will be reduced.

Current Laws & Regulations

Existing law, FAC Section 407, provides that the Secretary may adopt such regulations as are reasonably necessary to carry out the provisions of this code that the Secretary is directed or authorized to administer or enforce.

Existing law, FAC Section 5322, provides that the Secretary may establish, maintain, and enforce quarantine, eradication, and such other regulations as are in their opinion necessary to circumscribe and exterminate or prevent the spread of any pest that is described in FAC Section 5321.

Existing law, FAC Section 5761, provides that the Secretary may proclaim any portion of the state to be an eradication area with respect to the pest, prescribe the boundaries of such area, and name the pest and the hosts of the pest which are known to exist within the area, together with the means or methods which are to be used in the eradication or control of such pest.

Existing law, FAC Section 5762, provides that the Secretary may proclaim any pest with respect to which an eradication area has been proclaimed, and any stages of the pest, its

hosts and carriers, and any premises, plants, and things infested or infected or exposed to infestation or infection with such pest or its hosts or carriers, within such area, are public nuisances, which are subject to all laws and remedies which relate to the prevention and abatement of public nuisances.

Existing law, FAC Section 5763, provides that the Secretary, or the commissioner acting under the supervision and direction of the director, in a summary manner, may disinfect or take such other action, including removal or destruction, with reference to any such public nuisance, which he thinks is necessary.

The Department is the only agency which can implement pest eradication areas. As required by Government Code Section 11346.5(a)(3)(D), the Department has conducted an evaluation of these regulations and has determined that it is not inconsistent or incompatible with existing state regulations.

The existing law obligates the Secretary to investigate and determine the feasibility of controlling or eradicating pests of limited distribution but establishes discretion with regard to the establishment and maintenance of regulations to achieve this goal. This amendment provides the necessary regulatory authority to prevent the artificial spread of a serious insect pests, which is a mandated statutory goal.

Evaluation of Inconsistency/Incompatibility with Existing State Regulations

The Department is the only agency that can implement eradication areas. As required by Gov. Code Section 11346.5(a)(3)(D), the Department has conducted an evaluation of these regulations and has determined that it is not inconsistent or incompatible with existing state regulations.

Anticipated Benefits from This Regulatory Action

The implementation of this regulation is to allow for the eradication of guava root-knot nematode should it be found in California. Following these regulations will help prevent the spread of pests within California, which will prevent:

- direct damage to the agricultural industry growing host material
- indirect damage to the agricultural industry growing host due to the implementation of quarantines by other countries and loss of export markets
- loss of crops or cultivars from the market due to guava root-knot nematode susceptibility
- increased production costs to the affected agricultural industries
- increased pesticide use by the affected agricultural industries
- increased pesticide use by homeowners and others
- the need to implement a state interior quarantine
- the need to implement a federal domestic quarantine

California Environmental Quality Act

Prior to conducting any action authorized by this regulation, the Department shall comply with the California Environmental Quality Act of 1970 (Public Resources Code Section 21000 et. seq. as amended) and the State CEQA Guidelines (Title 14 California Code of Regulations Section 15000 et. seq.).

Mandate on Local Agencies or School Districts

The Department has determined that these regulations do not impose a mandate on local agencies or school districts.

Economic Impact Analysis (Government Code 11346.3(b))

The prevention of the spread of pests in California through the amendment and implementation of this regulation prevent economic harm to:

- the general public
- homeowners and community gardens
- agricultural industry
- the State’s general fund.

Without this regulation there is a higher risk the pest, if found, could spread into the local environment via the surrounding non-agricultural ecosystems. This could adversely impact private and commercial landscape plantings, local, regional, state and national parks, other recreational sites, open habitats, and wild lands. Affected plants could become less vigorous and may produce fewer seeds. Plants/trees with low propagule output can result in major changes to plant community structure.

The Creation or Elimination of Jobs within the State

Section 3591.34 will allow the Department to create an eradication area for guava root-knot nematode, helping prevent their spread within California should they be detected within the state. Detection and eradication activities are currently being performed by existing state staff throughout the state by trapping and identifying invasive agricultural pests. Therefore, the Department has determined that this regulatory proposal will not have a significant impact on the creation or elimination of jobs in California.

The Creation or Elimination of Businesses in California

Section 3591.34 will allow the Department to create an eradication area for guava root-knot nematode, which will help prevent their spread within California should they be detected within the state. Detection and eradication activities are currently being performed by existing state staff throughout the state by trapping and identifying invasive agricultural pests. Therefore, the Department has determined that this regulatory proposal will not have a significant impact on the creation or elimination of new businesses in the State of California.

The Expansion of Businesses in California

Section 3591.34 will allow the Department to create an eradication area for guava root-knot nematode, which will help prevent their spread within California should they be detected within the state. Detection and eradication activities are currently being performed by existing state staff throughout the state by trapping and identifying invasive agricultural pests. Therefore, the Department has determined that this regulatory proposal will not have

a significant impact on the expansion of businesses currently doing business in the State of California.

Worker Safety

This regulation is not expected to have an effect on worker safety.

Estimated Cost or Savings to Public Agencies or Affected Private Individuals or Entities

The Department of Food and Agriculture has determined that Section and 3591.34 does not impose a mandate on local agencies or school districts. All eradication activities shall be conducted by the Department and quarantines by county agricultural commissioners. Therefore, no reimbursement is required under Section 17561 of the Government Code.

The Department also has determined that no reimbursable costs or savings under Part 7 (commencing with Section 17500) of Division 4 of the Government Code to local agencies or school districts and no nondiscretionary costs or savings to local agencies or school districts, will result from the amendment of Section 3591.34.

There are no reimbursable costs or savings under Part 7 (commencing with section 17500) of Division 4 of the Government Code to local agencies or school districts and no nondiscretionary costs or savings to local agencies or school districts anticipated from the adoption of this amendment.

The Department has determined that the proposed actions will not have a significant adverse economic impact on housing costs or California business, including the ability of California businesses to compete with businesses in other states.

Potential Impact to Homeowners and Community Gardens

The implementation of this regulation will aid in preventing increased costs to the consumers of host materials and increased pesticide usage by homeowners and others. If an infestation of guava root-knot nematode is not eradicated or prevented from spreading

due to a delay in eradication and quarantine efforts, then homeowners and community gardeners would be negatively impacted.

Potential Impacts to General Fund and Welfare

The proposed amendment does have immediate or definitive impact to the general fund or general welfare. It would facilitate a fast and effective response if guava root-knot nematode are detected in the designated eradication area. Speed of response is key to eradicating an incipient pest infestation. Programmatic delays potentially can lead to pest quarantines, as well as increased production costs and potential job loss. The agricultural industry, including the nursery industry, is one of the economic engines in the State. Negative impacts to agriculture impact the State's economic recovery and the general welfare of the State. Additionally, any further job losses in this area would likely be felt by low-skilled workers whose employment options are already limited. The loss of any additional agricultural jobs would likely result in an increase in the State's public assistance obligations which would also negatively impact the State's economic recovery. Therefore, having this eradication area in place to allow expedited response if needed will help maintain the economic baseline.

The Department is the only agency which can implement eradication areas. As required by Government Code Section 11346.5(a)(3)(D), the Department has conducted an evaluation of this regulation and has determined that it is not inconsistent or incompatible with existing state regulations. After conducting a review for any regulations that would relate to or affect this area, the Department has concluded that these are the only regulations that concern guava root-knot nematode eradication areas in California.

Assessment

The amendment is designed to prevent or minimize the spread of guava root-knot nematode by amending Section 3591.34. The Department has made an assessment that the amendment to this regulation would: (1) not create or eliminate jobs within California, (2) not create new business or eliminate existing businesses within California,(3) not affect the expansion of businesses currently doing business within California, (4) is expected to

benefit the health and welfare of California residents, (5) is expected to benefit the state's environment, and is (6) not expected to benefit workers' safety. This Eradication Area will allow expedited response if needed, thus helping maintain the economic baseline.

Health and welfare: The proposed action will benefit the health and welfare of California residents by making it more likely that guava root-knot nematode would be detected before an infestation can happen, and, if there is an infestation, the Department can react quickly and effectively. Speed of response is key to eradicating an incipient pest infestation. Programmatic delays potentially can lead to pest quarantines, as well as increased production costs and potential job loss.

The state's environment: The proposed action will benefit the state's environment by increasing the chance that guava root-knot nematode would be detected and treated before an infestation happens. If the Department neglects to regulate the types of hosts, this pest could spread into the local environment via the surrounding non-agricultural ecosystems. This could adversely impact private and commercial landscape plantings, local, regional, state and national parks, other recreational sites, open habitats, and wild lands. Affected plants could become less vigorous and may produce fewer seeds. Plants/trees with low propagule output can result in major changes to plant community structure.

Alternatives Considered

The Department of Food and Agriculture must determine that no alternative considered would be more effective in carrying out the purpose for which the action is proposed or would be as effective as and less burdensome to affected private persons than the proposed action.

The Department considered taking no action. If no action is taken, the Department would need to would not have eradication authority for guava root-knot nematode when found in which would lead to a delays in regulatory response. If these response delays allowed guava root-knot nematode to spread and become fully established in host areas,

California's environment would suffer losses and loss of markets if other states or countries enact eradication areas against California products which are hosts for guava root-knot nematode. Therefore, this alternative was rejected.

Information Relied Upon

The Department is relying upon the following studies, reports, and documents in the adoption and amendment of Section 3591.34:

California Department of Food and Agriculture. *County Procedural Manual*, Section III – Page 22

California Department of Food and Agriculture. *California Agricultural Statistics Review 2023-2024*. Pages 12, 35, and 38

Chitambar, John, California Department of Food and Agriculture. (Updated August 22, 2024). *California Pest Rating for Meloidogyne enterolobii Yang and Eisenback*, 1983

Louisiana Department of Agriculture and Forestry. (July 13, 2018). *New Crop Pest Identified in Louisiana*

Louisiana Department of Agriculture and Forestry. (October 10, 2018). *Declaration of Emergency, Guava Root Knot Quarantine*

North Carolina Department of Agriculture and Consumer Services. (October 5, 2018). *NCDA&CS declares an internal quarantine for all North Carolina counties for the Guava knot nematode*

Overstreet, Charles. (July 16, 2018). *The Guava root-knot nematode – A new pest in Louisiana*

United States Department of Agriculture. (2023). *Treatment Schedules T500 - Schedules For Plant Pests And Pathogens*. Section 5-6-16 through 5-6-18.