

DEPARTMENT OF FOOD AND AGRICULTURE
PROPOSED CHANGES IN THE REGULATIONS

3 CCR § 3289

Guava Root-Knot Nematode Exterior

Quarantine

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 3289 Guava Root-Knot Nematode Exterior Quarantine. These regulations will allow the Department to create an Exterior Quarantine 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 Department to protect the agricultural industry from the movement and spread of injurious plant pests within California. The specific purpose of Guava Root-Knot Nematode Exterior Quarantine is to provide authority to the State to establish guava root-knot nematode, *Meloidogyne enterolobii*, also known as *M. mayaguensis*, as a quarantine pest, the area under quarantine, and the articles and commodities covered within, and the restrictions on movement.

Background

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.

Meloidogyne enterolobii 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.

Major hosts : pepper (*Capsicum annuum*) (\$278M), watermelon (*Citrullus lanatus*) (\$133M), coffee (*Coffea arabica*), soybean (*Glycine max*), sweet potato (*Ipomoea batatas*) (\$282M), tobacco (*Nicotiana tabacum*), guava (*Psidium guajava*), tomato (*Solanum lycopersicum*) (\$1.75B), eggplant (*S. melongena*), cotton (*Gossypium* spp.) (\$464M), celery (*Apium graveolens*) (\$380M), cabbage (*Brassica oleracea* var. *oleracea*) (\$256M) common bean (*Phaseolus vulgaris*) (\$80M), garden beet (*Beta vulgaris*), squash (*Cucurbita* spp.) (\$38M), and sweet basil (*Ocimum basilicum*). Minor hosts include garden and houseplants such as *Angelonia angustifolia*, *Aquilaria malaccensis*, *Brugmansia*, *Enterolobium contortisiliquum*, *Euphorbia punicea*, *Hibiscus* spp., *Maranta arundinacea*, *Morinda citrifolia*, *Morus nigra*, *Paulownia elongata*, *Syzygium aromaticum*, *Thunbergia*, *Tibouchina*, *Solanum tuberosum* (potato) (\$305M), *Bidens pilosa*, *Lactuca sativa* (lettuce) (\$3.14B), and *Cucumis sativus* (cucumber) (\$22.7M) (estimated 2022/23 value included for products that the Department considers a statistically significant crop in California). 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 *M. enterolobii*. It was possible that this nematode species may have already entered the state undetected, as prior to 2005 *Meloidogyne* spp. 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, *M. enterolobii* 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, *M. enterolobii* has not been reported from California by other researchers/nematologists in the gray or peer-reviewed literature. Identification to species level through DNA analysis is now essential for accurate identification of this species. Due to the wide host range, this species could establish itself within California.

Because of the way in which sweet potatoes propagules are imported from *M. enterolobii* infested areas, they represent the most likely host pathway for *M. enterolobii* to enter California. In order to demonstrate that California currently is free from *M. enterolobii*, a 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 *M. enterolobii*. As *M. enterolobii* 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 allowed to be 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 *M. enterolobii* 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 3289 to establish an exterior quarantine against guava root-knot nematode.

Project Descriptions

This regulation will provide authority for the State to perform specific detection and exclusion activities against the guava root-knot nematode in California. This authority includes restricting entry and requiring certifications.

(a) Pest

Section (a) defines the pest for which regulation 3289 proposes to establish a quarantine. 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.

(b) Area Under Quarantine

Section (b) defines the areas that are under quarantine due to their current infestation of guava root-knot nematode. The quarantine is for states where the guava root-knot nematode is currently found and includes the states of Florida, Georgia, Louisiana, North Carolina, and South Carolina.

(c) Articles and Commodities Covered

Section (c) The following articles and commodities can host guava root-knot nematode and are therefore restricted entry into California when shipped from the area under quarantine:

- 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.

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

Exemptions from the quarantine 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 because they do 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 to infest.
- Aquatic plants grown in soil-free environments, or aquatic plants without soil, because they do not provide any opportunity for guava root-knot nematode to infest.
- 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.
- 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.

(d) Restrictions

When moved directly from a quarantined state or by diversion or re-consignment from any other point all commodities listed in Section C have restricted entry due to the risk of infestation. They are prohibited entry unless each shipment or lot is accompanied by a certificate issued by the authorized agricultural official of the state, district, or commonwealth where the commodity is produced, and the certificate establishes that all material meets at least one of the following conditions:

- A. Surveys, using methods approved by the California Department of Food and Agriculture, conducted annually or during the one year prior to shipment, show that guava root-knot nematode does not exist on the property or premise or facility used to grow the nursery stock, and that the seed or plant parts used for production of the plants were determined by the certifying officer to be free from guava root-knot nematode.

- B. The plants or plant parts being shipped to California are protected from guava root-knot nematode infestation by all the following sanitation methods, as established in previous state exterior quarantine regulations for root-knot nematodes:
1. Propagated from clean seed or from cuttings taken at least 12 inches above ground level. Seeds and cuttings from 12 inches above ground level do not provide opportunities for guava root-knot nematode to infest;
 2. Planted in sterilized soil or other suitable material prepared or treated to assure freedom from guava root-knot nematode;
 3. Retained in sterilized pots, containers, or beds. A sterilized environment does not provide opportunities for guava root-knot nematode to infest;
 4. Placed on sterilized benches or sterilized supports at least 18 inches from the ground or floor level to avoid ground contamination;
 5. Area beneath benches or supports holding plants have been treated at six-month intervals with a registered nematicide or other material having nematicidal value and approved by the origin state agricultural officials, except when smooth clean flooring of concrete is present, to prevent guava root-knot nematode infestations and growth;
 6. Plants and growing media sampled using methods approved by the California Department of Food and Agriculture and found free of guava root-knot nematode;
 7. Protected from contamination by guava root-knot nematode until shipped.
- C. The shipment consists of only unrooted plant cuttings, provided that the cuttings were taken from that portion of the plant which is growing at least 12 inches above ground level, and were protected from contamination until shipped so there is no opportunity for infestation.

Current Laws & Regulations

Existing law, FAC Section 5301, provides that the Secretary may establish, maintain, and enforce such quarantine regulations as they deem necessary to protect the agricultural industry of this state from pests. The regulations may establish a quarantine at the boundaries of this state or elsewhere within the state.

Existing law, FAC Section 5302, provides that the Secretary may make and enforce such regulations as they deem necessary to prevent any plant or thing which is, or is liable to be, infested or infected by, or which might act as a carrier of, any pest, from passing over any quarantine line which is established and proclaimed pursuant to this division.

The Department is the only agency which can implement pest quarantines. 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 plant quarantine and 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 these regulations prevent the introduction of guava root-knot nematode from interstate travel and shipping. 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
- increased production costs to the affected agricultural industries

- increased pesticide use by the affected agricultural industries
- increased costs to the consumers of host fruits
- 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 pests 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

The implementation of this regulation will prevent the introduction of guava root-knot nematode into California from interstate travel and shipping. Inspection activities are currently being performed by existing state and county staff at entry points throughout the state. The Department does not expect that additional review of compliance agreement or phytosanitary certificate would require significantly greater staff time. 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

The implementation of this regulation will prevent the introduction of guava root-knot nematode from interstate travel and shipping. Inspection activities are currently being performed by existing state and county staff at entry points throughout the state. There are no new vendors that will be formed to provide this service or current vendors may hire new staff. 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

The implementation of this regulation will prevent the introduction of guava root-knot nematode from interstate travel and shipping. Inspection activities are currently being performed by existing state and county staff at entry points throughout the state. There will be no businesses expanded to provide these services. 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

The amendment of 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 3289 does not impose a mandate on local agencies or school districts. 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 adoption of Section 3289.

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 prevent the introduction of guava root-knot nematode into California from interstate travel and shipping. By implementing an exterior quarantine, the Department has a higher likelihood of keeping these pests out of California. If this pest were to become established it would impact plants that are commonly planted by homeowners and in community gardens, increasing costs of finding new unimpacted species and pesticide usage.

Potential Impacts to General Fund and Welfare

The proposed regulations do not have immediate or definitive impact to the general fund or general welfare, however, here may be a long-term positive impact. The regulation is intended to prevent the introduction of guava root-knot nematode into California from interstate travel and shipping. There is a higher likelihood of keeping these pests out of California if there is an exterior quarantine. The agricultural 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 of California's public assistance obligations which would also negatively impact the state's economic recovery.

Significant Adverse Impact on Business

The Department has determined that the proposed action will not have a significant adverse economic impact on businesses, including the ability of California businesses to compete with businesses in other states. The Department's determination that this action will not have a significant adverse economic impact is based on the fact that this regulation does not place any requirements or restrictions on businesses. This action only provides authority to prevent the introduction of guava root-knot nematode from interstate travel and shipping and does not require reporting, recordkeeping, or compliance by businesses.

Assessment

These conclusions are based upon the same analysis related to the adverse economic impact on business above. Further the Department does not expect these actions to create jobs or businesses.

The Department has made an assessment that the amendment to these regulations would: (1) not create or eliminate jobs in the state of California, (2) not create new businesses or eliminate existing businesses in the state of California, (3) not affect the expansion of businesses currently doing business in the state of California, (4) benefit the health and welfare of California residents, (5) benefit the state's environment, and (6) not expected to benefit workers' safety.

The health and welfare of California residents: The proposed action will benefit the health and welfare of California residents by preventing the establishment of a pest that could spread into the local environment via the surrounding non-agricultural ecosystems. Infestations lead to increased costs to the consumers of host materials and increased pesticide usage.

The state's environment: The proposed action will benefit the environment as preventing the establishment of a pest lowers the risk that the pests could spread into the local environment via the surrounding non-agricultural ecosystems.

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 has considered taking no action. If no action is taken there would be no exterior quarantine and there would be a risk that guava root-knot nematode could become established within California, causing harm to the agricultural industry. The alternative was rejected because it would have adverse effects on the industry and could lead to the loss of value for the state of California if guava root-knot nematode becomes established.

Information Relied Upon

The Department relied upon the following documents in the proposed amendment of Section 3289:

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

California Department of Food and Agriculture. *California Agricultural Statistics Review 2022-2023*. Pages 25, 27, 111, 113, 116, 117, 118 and 122.

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.