CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal for

Neoscytalidium dimidiatum (Penzig) Crous & Slippers

sooty canker/Bot gummosis

Current Pest Rating: Z

Proposed Pest Rating: C

Kingdom: Fungi, Phylum: Ascomycota,
Subphylum: Pezizomycotina, Class: Dothideomycetes,
Order: Botryosphaeriales, Family: Botryosphaeriaceae

Comment Period: 07/08/2025 through 08/22/2025

Initiating Event:

This pathogen has not been through the pest rating process. The risk to California from *Neoscytalidium dimidiatum* is described herein and a permanent rating is proposed.

History & Status:

Background:

Species in the family Botryosphaeriaceae ("Bots") have a worldwide distribution and function as saprobes, parasites, and endophytes on many diverse plant hosts (Slippers and Wingfield 2007). In California, bot fungi have been reported on many fruit and nut crops, as well as forest and riparian trees, plus ornamentals. Infection leads to a variety of different symptoms, including leaf, shoot, and fruit blights; stem and branch cankers; dieback; and gummosis (Downer and Michailides, 2022; Eskalen et al., 2024). Multiple members of Botryosphaeriaceae cause diseases with the common name "sooty canker" or "gummosis". One such species, originally named *Dothiorella magiferae*, (now *Neofusicoccum mangiferae)*, and has previously received a C-rating (Chitambar, 2016). These pathogens can have overlapping host ranges.

Neoscytalidium dimidiatum (syn. *Fusicoccum dimidiatum*) has been known under many different names, including *N. hyalinum, Hendersonula toruloidea*, *Scytalidium dimidiatum,* and *Torula dimidiata*. The taxonomic placement has been difficult because this fungus produces two different asexual states known as synanamorphs that have been described by multiple mycologists. It has a coelomycetous morph that produces pycnidia with conidia that are two-septate, with a darkened central cell that

resembles fusicoccum-like conidia. It also has a hyphomycetous morph that produces powdery arthric chains of conidia that may form a central septum, and these resemble scytalidium-like conidia. Both the pycnidial and arthric synanamorphs and bootstrap analysis show a close alignment to *Botryosphaeria* within the family Botryosphaeriaceae (Farr et al., 2005). Crous et al. (2006) formed 12 clades and placed it in a new monospecific genus, *Neoscytalidium,* as *Neoscytalidium dimidiatum*, based on the powdery disarticulating production of aerial conidia. This placement is strongly supported by the sequence data of the 28S rDNA and DNA-based phylogenetic analysis within the Botryosphaeriaceae.

In addition to plant diseases, this fungus can cause superficial, deep, or systemic infections, including on the skin, sinus, lung, and brain, primarily in immunosuppressed people, and is described as a serious clinical threat for immunocompromised hosts (Garinet et al., 2015).

Hosts: There are over 100 species of hosts, representing at least 46 plant families. The full host range of this species is likely broader than currently known, as it can act as an endophyte/saprophyte instead of a pathogen in some plant species (Derviş and Özer, 2023).

Acacia auriculiformis (earleaf acacia), *A. melanoxylon* (Australian blackwood), *A. synchronicia* (umbrella thorn), *Adansonia gibbosa* (baobab), *A. gregorii* (boab), *A. perrieri* (Madagascar baobab), *Agave sisalana* (sisal), *Agave* sp., *Aloidendron dichotomum* (quiver tree), *Anacardium occidentale* (cashew), *Ananas comosus* (pineapple), *Arachnis* sp. (spider orchid), *Araucaria* sp. (araucaria), *Arbutus menziesii* (pacific madrone), *A. unedo* (strawberry tree), *Azadirachta indica* (neem), *Capsicum annuum* (bell pepper), *Castanea sativa* (sweet chestnut), *Cattleya lueddemanniana* (cattleya orchid), *Cattleya* sp. (cattleya orchid), *Casuarina* sp. (she-oak), *Citrus aurantiifolia* (key lime), *C. clementina* (clementine), *C. grandis* (pomelo), *C. latifolia* (Persian lime), *C. limettioides* (sweet lime), *C. limon* (lemon), *C. maxima* (pomelo), *C. meyeri* (meyer lemon), *C. reticulata* (mandarin orange), *C. sinensis* (sweet orange), *Citrus* sp. (citrus), *C. ×paradisi* (grapefruit), *C. ×tangelo* (tangelo), *Crotalaria medicaginea* (rattlepod), *Crotalaria* sp. (rattlepod), *Cucumis melo* (melon), *Dioscorea esculenta* (lesser yam), *Diospyros kaki* (persimmon), *Eriobotrya japonica* (loquat), *Ficus benjamina* (weeping fig), *F. carica* (common fig), *F. nitida* (Indian laurel fig), *F. religiosa* (sacred fig), *Ficus* sp. (fig), *Furcraea gigantea* (giant cabuya), *Gladiolus* sp. (gladiolus), *Grevillia agrifolia* (grevillea), *Hylocereus polyrhizus* (red dragon fruit), *H. polyrhizus-undatus* (hybrid dragon fruit), *Hylocereus* sp. (dragon fruit), *H. undatus* (white dragon fruit), *Hymenocallis littoralis* (beach spider lily), *Ipomoea batatas* (sweet potato), *Jatropha curcas* (physic nut), *Juglans californica* (California black walnut), *J. regia* (English walnut), *Juglans* sp. (walnut), *Malus domestica* (apple), *M. pumila* (apple), *Mangifera indica* (mango), *Manihot esculenta* (cassava), *M. utilissima* (cassava), *Melia azedarach* (chinaberry), *Morus alba* (white mulberry), *Morus* sp. (mulberry), *Musa acuminata* (banana), *M. nana* (dwarf banana), *Musa* sp. (banana), *Origanum onites* (Cretan oregano), *Philodendron bipinnatifidum* (lacy tree philodendron), *Pinus eldarica* (Afghan pine), *P. nigra* (Austrian pine), *P. sylvestris* (Scots pine), *Pistacia vera* (pistachio), *Populus alba* (white poplar), *P. fremontii* (Fremont cottonwood), *P. nigra* (black poplar), *Prunus amygdalus* (almond), *P. armeniaca* (apricot), *P. avium* (sweet cherry), *P. domestica* (plum), *P. dulcis* (almond), *P. persica* (peach), *Prunus* sp. (prunus), *Psidium guajava* (guava), *Punica granatum* (pomegranate), *Quercus brantii* (Brant's oak), *Rhus typhina* (staghorn sumac), *Salix alba* (white willow), *Salix* sp. (willow), *Salvia officinalis* (common

sage), *Sansevieria guineensis* (snake plant), *S. trifasciata* (mother-in-law's tongue), *Sequoia gigantea* (giant sequoia), *Solanum lycopersicum* (tomato), *S. tuberosum* (potato), *Syzygium cumini* (java plum), *Ulmus* sp. (elm), *Vitis vinifera* (common grapevine), *Vitis* sp. (grape) (Farr and Rossman, 2025).

Symptoms: *Neoscytalidium dimidiatum* causes disease in various parts of its host plants. The pathogen typically enters through pre-existing wounds, and disease severity increases in plants under abiotic stress. Symptoms include dieback of branches and limbs, branch wilting, cankers on trunks, stems and branches, sooty cankers, blights of spurs and shoots, needle blights, leaf blights, leaf spots, leaf scorch, gummosis, loss of graft union viability, root rot, black root rot, dry rot in stem cuttings, collar rot, post-harvest stem end rots, stem rots, fruit rots, internal brown or black stem and fruit rots, tuber rots, and lamination of trunk bark. On some hosts, it can be asymptomatic or quiescent, with symptoms appearing long after infection (Derviş and Özer, 2023).

On citrus in California, *N. dimidatum* is called "Bot gummosis" and is the cause of branch cankers, dieback, and gummosis. Portions of trunks or branches will have dead outer bark over a canker. This dead bark can be attached to the tree so tightly that it is not immediately obvious that it is dead. The cambial layer of wood underneath the bark may be brown to yellowish and can exude gum. Cankers can spread up and down the cambium in grooves with shallow, yellowish-brown discoloration of the underlying wood. It produces spores in a powdery mass that can be easily airborne and spread to tree wounds (Eskalen et al., 2024).

Walnuts develop black canker, root rot, graft union failure resulting in death, overall decline, sooty canker formation, as well as branch wilt. Early symptoms of branch wilt develop on portions of the tree with southwest exposure. From midsummer to early fall, leaves yellow and wither on the outermost branches. Leaves on larger limbs can suddenly wither, turn dull green, then dark brown, and dry out. Leaves can remain attached to the affected branches. Fruit that has been desiccated by branch wilt can also be colonized by the pathogen, which can be isolated from the shriveled kernels. Portions of the thin outer layer of bark on the branches peel away, exposing a black, sooty, dusty mass of fungal arthrospores. Diseased branches have a gray to dark brown discoloration in the shape of a cylinder or wedge extending into the center of the wood (Adaskaveg et al., 2017).

Infected grapevines show foliar symptoms including shoot blight, wilting and necrosis of leaves, and drying and shriveling of berries. Entire vine collapse (apoplexia) was seen in the middle of the growing season. Wood cankers in the spurs, cordons, and trunks of affected vines also develop (Rolshausen et al. 2013).

On almonds in the southern San Joaquin Valley, cankers with intensely dark wood discoloration extending longitudinally, bark lesions, and gumming in trunks and branches were attributed to *N. dimidiatum*. Fruit rot associated with blighted spurs and shoots was commonly detected in multiple orchards in Kern County (Nouri et al., 2018).

Transmission: Pruning wounds, mechanical injury, frost, and sunburn damage have been reported as points of entry for spores, but for some hosts, natural openings are also points of infection (Derviş and Özer, 2023). The pathogen produces spores in a powdery mass that can easily become airborne and

spread. Citrus nurseries may serve as significant sources of pathogen spread, through planting infected nursery plants (Al-Sadi et al., 2014). *Neoscytalidium dimidiatum* can potentially be transmitted through seeds, soil, and/or the air, and it may persist in the soil in association with infected tomato debris (Türkölmez et al., 2019).

Damage Potential: Across a diverse range of woody hosts in tropical and semi-tropical regions, *N. dimidiatum* is a wound-invading pathogen, with a tendency to infect branches and trunks that have experienced damage from sunburn, freezing, or pruning. Bot gummosis of citrus can cause rapid decline and death of a tree. Young citrus trees are especially susceptible if the affected tissues are not removed (Eskalen et al., 2024).

Walnuts suffer economic losses when branches and shoots are infected, and when lesions on the hulls cause fruit to fall prematurely (Adaskaveg et al., 2017). *Neoscytalidium dimidiatum* is a highly virulent pathogen of almonds in California, causing losses due to canker, shoot blight, and fruit rot in affected orchards (Nouri et al., 2018). On dragon fruit, both stem cankers and fruit infection from *N. dimidiatum* are major disease problems (Hong et al., 2020). This pathogen has become increasingly invasive in nurseries and orchards around the world (Derviş and Özer, 2023).

Worldwide Distribution: Africa: *Algeria, Egypt, Ghana, Guinea, Kenya, Mali, Niger, Sierra Leone, South Africa, Sudan, Tanzania,* and *Tunisia*. Asia: *China, Cyprus, India, Iran (Islamic Republic of), Iraq, Israel, Jordan, Malaysia, Oman, Pakistan, Philippines, Saudi Arabia, Taiwan, Thailand, Turkey, United Arab Emirates, Vietnam*. Europe: *Cyprus, Greece, Italy, Portugal*. North America: *Canada, Mexico, Puerto Rico*, *United States* (California, Florida, Hawaii). Oceania: *Australia, Solomon Islands*. South America: *Brazil, Colombia, Ecuador* (CABI, 2025; Farr and Rossman, 2025).

Official Control*: Neoscytalidium dimidiatum* is on the EPPO's A2 list for Egypt and is a regulated quarantine pest in Mexico (EPPO, 2025). It is on the USDA PCIT's harmful organisms list for Egypt, Mexico, and Nicaragua (USDA-PCIT, 2025).

California Distribution: Humboldt, Imperial, Madera, Orange, Riverside, Sacramento, San Diego, Santa Barbara, Santa Clara counties (CDFA PDR database, 2025).

California Interceptions: Multiple interceptions on *Sansevieria* nursery stock from Florida.

The risk that *Neoscytalidium dimidiatum* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** This pathogen is likely to be found wherever its hosts are grown.

Evaluate if the pest would have suitable hosts and climate to establish in California.

Score: **3**

- Low (1) Not likely to establish in California, or likely to establish in very limited areas.

- Medium (2) may be able to be established in a larger but limited part of California.
- High (3) likely to establish a widespread distribution in California.

2) **Known Pest Host Range:** The host range is extensive, including herbaceous and woody plants in multiple families.

Evaluate the host range of the pest.

Score: 3
- Low (1) has a very limited host range.
- Medium (2) has a moderate host range.
- High (3) has a wide host range.

3) Pest Reproductive Potential: This pathogen reproduces with multiple types of airborne spores. It can also be moved with infected nursery stock, plant parts, and green waste.

Evaluate the natural and artificial dispersal potential of the pest.

Score: 3
- Low (1) does not have high reproductive or dispersal potential.
- Medium (2) has either high reproductive or dispersal potential.
- High (3) has both high reproduction and dispersal potential.

4) **Economic Impact:** This pathogen is capable of killing trees and infecting fruit crops, causing significant losses. It is a quarantine pest for Mexico, an important trading partner.

Evaluate the economic impact of the pest on California using the criteria below.

Economic Impact: A, B, C
A. The pest could lower crop yield.
B. The pest could lower crop value (including increasing crop production costs).
C. The pest could trigger the loss of markets (including quarantines).
D. The pest could negatively change normal cultural practices.
E. The pest can vector, or is vectored, by another pestiferous organism.
F. The organism is injurious or poisonous to agriculturally important animals.
G. The organism can interfere with the delivery or supply of water for agricultural uses.

Economic Impact Score: **3**
- Low (1) causes 0 or 1 of these impacts.
- Medium (2) causes 2 of these impacts.
- High (3) causes 3 or more of these impacts.

5) **Environmental Impact:** This pathogen is known to infect riparian plants and forest trees. Cankers are pruned out of orchards to reduce inoculum and maintain tree canopy integrity.

Evaluate the environmental impact of the pest on California using the criteria below.

Environmental Impact: A, E

A. The pest could have a significant environmental impact such as lowering biodiversity, disrupting natural communities, or changing ecosystem processes.
B. The pest could directly affect threatened or endangered species.
C. The pest could impact threatened or endangered species by disrupting critical habitats.
D. The pest could trigger additional official or private treatment programs.
E. The pest significantly impacts cultural practices, home/urban gardening, or ornamental plantings.

Environmental Impact Score: 3
- Low (1) causes none of the above to occur.
- Medium (2) causes one of the above to occur.
- High (3) causes two or more of the above to occur.

Consequences of Introduction to California for *Neoscytalidium dimidiatum:* high

Add up the total score and include it here. **15**
-Low = 5-8 points
-Medium = 9-12 points
-High = 13-15 points

6) **Post-Entry Distribution and Survey Information**: Evaluate the known distribution in California. Only official records identified by a taxonomic expert and supported by voucher specimens deposited in natural history collections should be considered. Pest incursions that have been eradicated, are under eradication or have been delimited with no further detections should not be included.

Evaluation is 'high'.

Score: -3
-Not established (0) Pest never detected in California or known only from incursions.
-Low (-1) Pest has a localized distribution in California or is established in one suitable climate/host area (region).
-Medium (-2) Pest is widespread in California but not fully established in the endangered area, or pest established in two contiguous suitable climate/host areas.
-High (-3) Pest has fully established in the endangered area, or pest is reported in more than two contiguous or non-contiguous suitable climate/host areas.

7) **The final score is** the consequences of the introduction score minus the post-entry distribution and survey information score: (Score)

Final Score: *Score of Consequences of Introduction – Score of Post Entry Distribution and Survey Information* ***= 12***

Uncertainty:

The adaptability of thermotolerant *Neoscytalidium* to diverse environmental conditions, including elevated temperatures and drought periods, could contribute to heightened virulence and continued spread in California to new regions and new hosts (Derviş and Özer, 2023).

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for ***Neoscytalidium dimidiatum*** **is C.**

References:

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Responsible Party:

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***Comment Period: 07/08/2025 through 08/22/2025**

***NOTE:**

You must be registered and logged in to post a comment. If you have registered and have not received the registration confirmation, please contact us at permits[@]cdfa.ca.gov.

Comment Format:

- Comments should refer to the appropriate California Pest Rating Proposal Form subsection(s) being commented on, as shown below.

  Example Comment:

  Consequences of Introduction: 1. Climate/Host Interaction: [Your comment that relates to "Climate/Host Interaction" here.]

- Posted comments will not be able to be viewed immediately.
- Comments may not be posted if they:

  Contain inappropriate language which is not germane to the pest rating proposal;

  Contains defamatory, false, inaccurate, abusive, obscene, pornographic, sexually oriented, threatening, racially offensive, discriminatory or illegal material;

  Violates agency regulations prohibiting sexual harassment or other forms of discrimination;

  Violates agency regulations prohibiting workplace violence, including threats.

- Comments may be edited prior to posting to ensure they are entirely germane.
- Posted comments shall be those which have been approved in content and posted to the website to be viewed, not just submitted.

Proposed Pest Rating: C
