



syngenta®

A unique, powerful fungicide for control of root rot, brown rot and other Oomycete diseases in citrus.

Orondis® fungicide: powerful control of Oomycete diseases in citrus

Orondis contains oxathiapiprolin, the only fungicide active ingredient in FRAC Group 49, and offers a unique and powerful mode of action for improved root health and outstanding control of *Phytophthora* root rot and brown rot.

Orondis protects developing citrus root systems by reducing the number of viable *Phytophthora* propagules in the soil, which in turn reduces inoculum potential when compared to competitor products. Root protection from Orondis treatment can improve root mass, facilitate better water and nutrient use, improve root health, and ultimately increase yield and profit potential.

SPECTRUM OF OOMYCETE ACTIVITY IN CITRUS

- Root rot (*Phytophthora spp.*)
- Brown rot (*Phytophthora spp.*)
- Citrus foot rot (*Phytophthora spp.*)
- Gummosis (*Phytophthora spp.*)
- Trunk canker (*Phytophthora spp.*)

ORONDIS TECHNICAL PROFILE

Chemistry	Oxathiapiprolin [piperidiny]-thiazole-isoxazolines class (FRAC Code 49)]
Mode of action	Oxysterol binding protein (OSBP) inhibition
Formulation	Suspension concentrate (SC), 1.67 lbs. oxathiapiprolin per gallon
Precautions	No signal word; Standard Personal Protective Equipment (PPE)
Re-entry (REI)	4 hours

BROWN ROT

Like root rot, citrus brown rot can be caused by multiple species of *Phytophthora*. Infection is most common on fruit growing near the ground, and is often caused by rain splashing spores from the soil up onto the tree. Symptoms don't usually appear until fruit are nearly mature. Brown rot starts as small spots but rapidly develops into larger lesions with a characteristic pungent smell. Under high humidity, a white mycelium may form on the surface of the fruit. Infected fruit can go undetected at harvest and infect additional fruit during storage.



Oranges infected with brown rot after abscission from the tree

White *Phytophthora* mycelium on the fruit rind

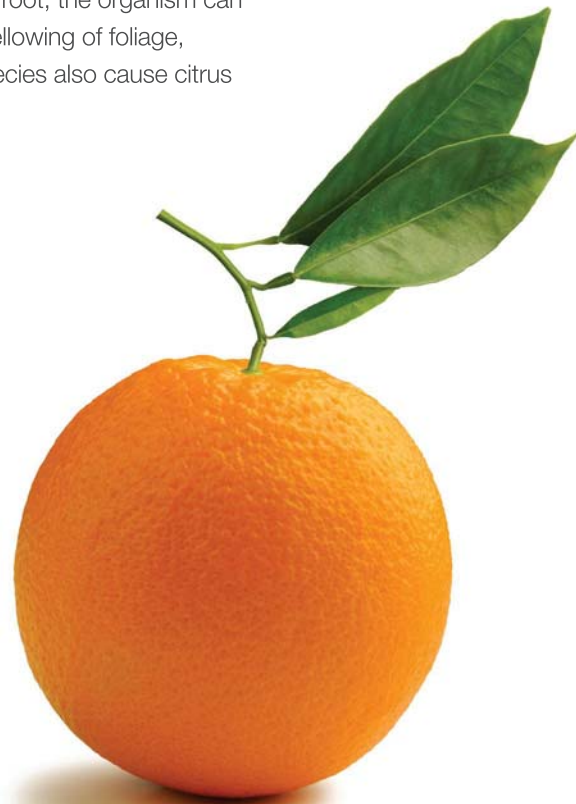
Source: J. Adaskaveg, University of California Riverside

ROOT ROT

Citrus root rot can be caused by several different species of *Phytophthora*, a water mold in the Oomycete class found around the world. The development of soilborne *Phytophthora* is favored by warm, wet conditions, with the dispersal of the pathogen via motile zoospores. When zoospores contact a root, the organism can enter through the root tip, infect and rot the root. Above-ground symptoms include yellowing of foliage, abscission of leaves, dying shoots, and reduced fruit size and yield. *Phytophthora* species also cause citrus foot rot, gummosis and trunk canker.



Diseased citrus root (left) contrasted with a healthy root system (right)



RESISTANCE MANAGEMENT AND BEST USE GUIDELINES

Oxathiapiprolin has a novel mode of action and is the only fungicide active ingredient in FRAC Group 49. It shows no cross-resistance to other fungicides used in management of Oomycete diseases. However, with potent inhibitory activity at the biochemical level and a single site mode of action, there is the potential for development of reduced sensitivity or resistance in fungal populations. Follow resistance management practices specified on the product label:

- Make **NO MORE THAN 2** sequential applications before rotating to a fungicide with a different mode of action.
- **DO NOT** use in citrus nurseries.
- **DO NOT** follow soil applications of oxathiapiprolin-containing products with foliar applications of oxathiapiprolin-containing products. Use either soil applications or foliar applications but not both for disease control.



SUGGESTED APPLICATION TIMING

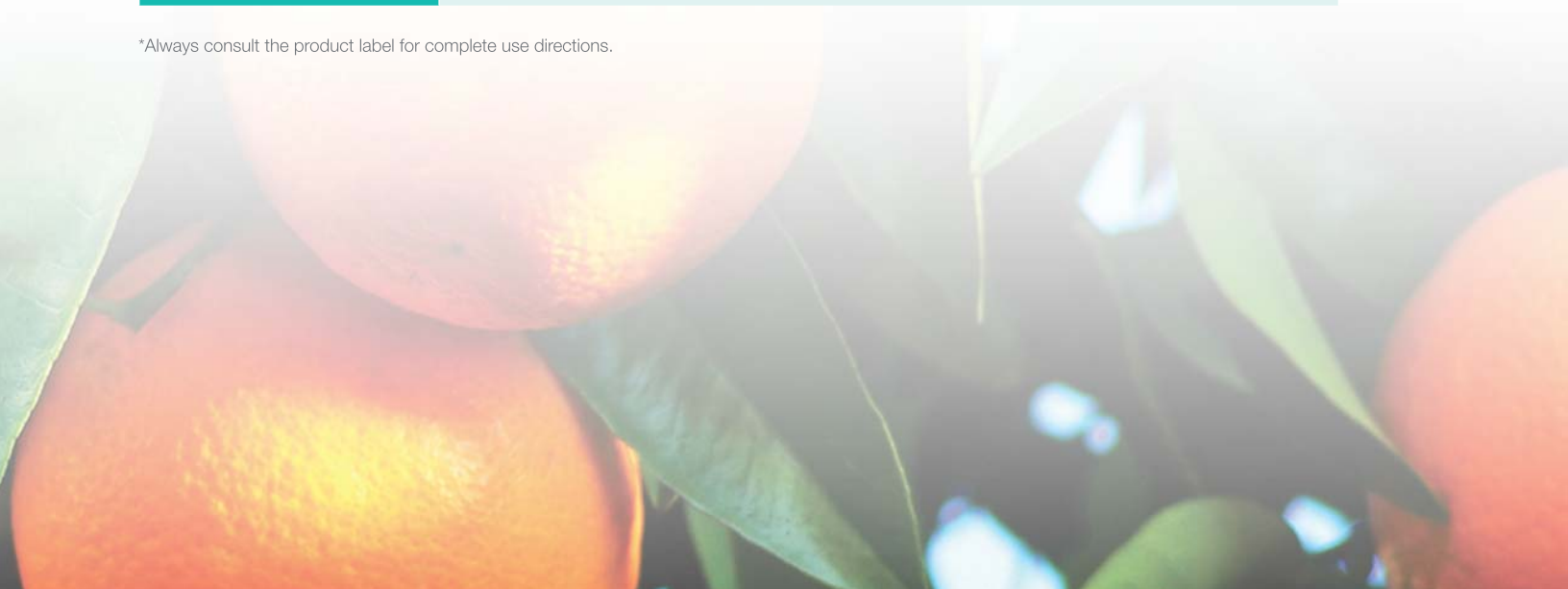
- Citrus resets or new plantings (soil): make first application at planting and up to one additional application approximately 3-6 months later, coinciding with a root growth flush.
- Established plantings (soil): Make two applications at a 3- to 6-month interval, coinciding with root growth flush.
- Brown rot (fruit): Make single application to fruit before initial signs of brown rot appear. Or, for post-harvest control of brown rot, apply at 0 to 1 day before harvest.



ORONDIS LABEL AT A GLANCE*

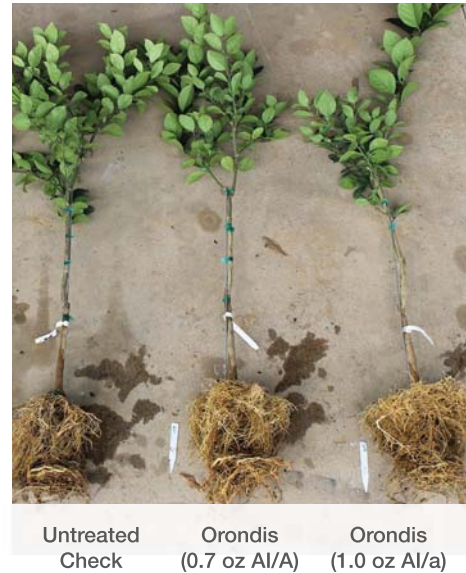
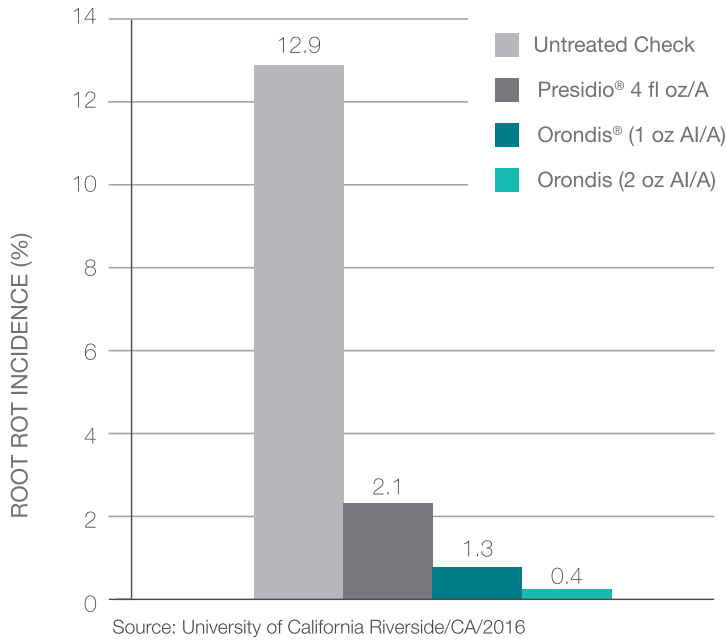
	Soil application	Foliar/fruit application
Rate	4.8 – 9.6 fl oz/A	2.4 fl oz/A
Maximum amount per growing season	19.2 fl oz/A	2.4 fl oz/A
Application	Soil spray around the base of the tree, or through irrigation water. Ensure that product solution thoroughly wets the root zone.	Apply by ground or air in sufficient volume to provide uniform, complete coverage of fruit.
Pre-harvest interval (PEI)	–	0 days
Adjuvants	Orondis may be used with adjuvants at typical agricultural use rates for these adjuvants.	
Crop rotation intervals	0 days for tuberous and corn vegetables, bulb vegetables, leafy greens, brassica leafy greens, brassica (head and stem), edible-podded and succulent shelled peas, fruiting vegetables, caneberry, cucurbit vegetables, strawberries, oilseed, stalk and stem vegetables, ginseng, tobacco. 30 days for cereals and grass animal feeds. 180 days for herbs and spices, legume vegetables (except succulent shelled and edible-podded peas), non-grass animal feed, peanuts, all other crops not listed.	

*Always consult the product label for complete use directions.



Performance Results

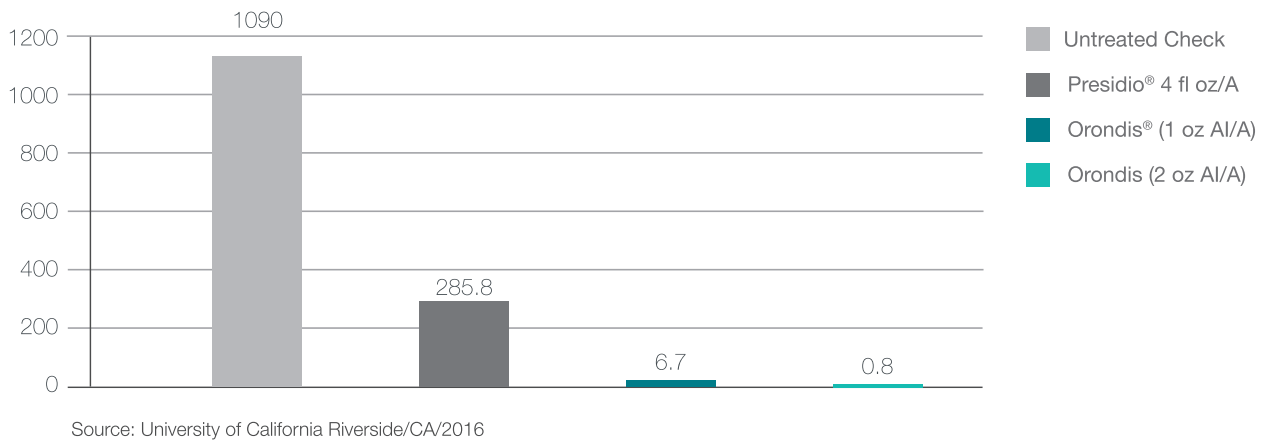
ORONDIS DELIVERS OUTSTANDING CONTROL OF PHYTOPHTHORA ROOT ROT IN CITRUS



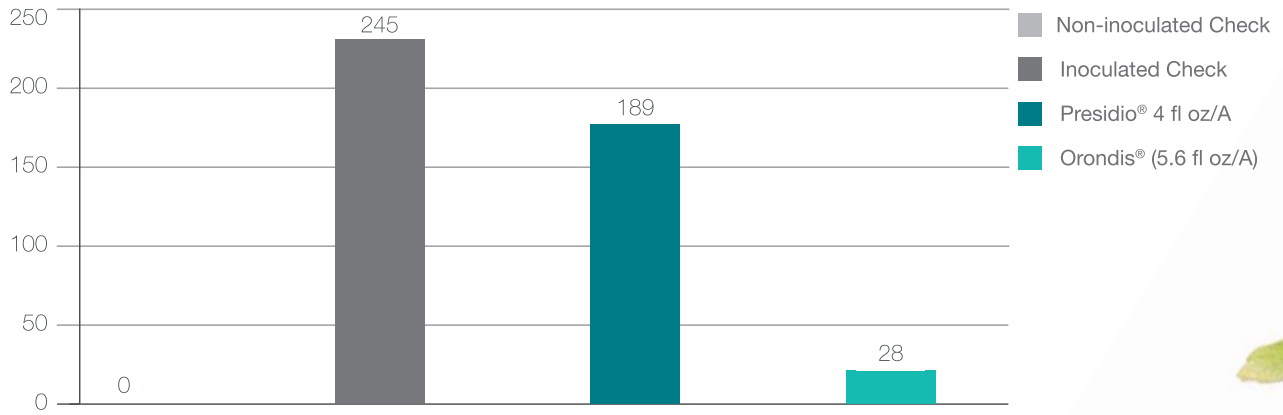
Source: USVF0F6212015

ORONDIS PROTECTS CITRUS ROOT SYSTEMS BY REDUCING THE NUMBER OF VIABLE PHYTOPHTHORA PROPAGULES IN THE SOIL

Phytophthora propagules/g soil

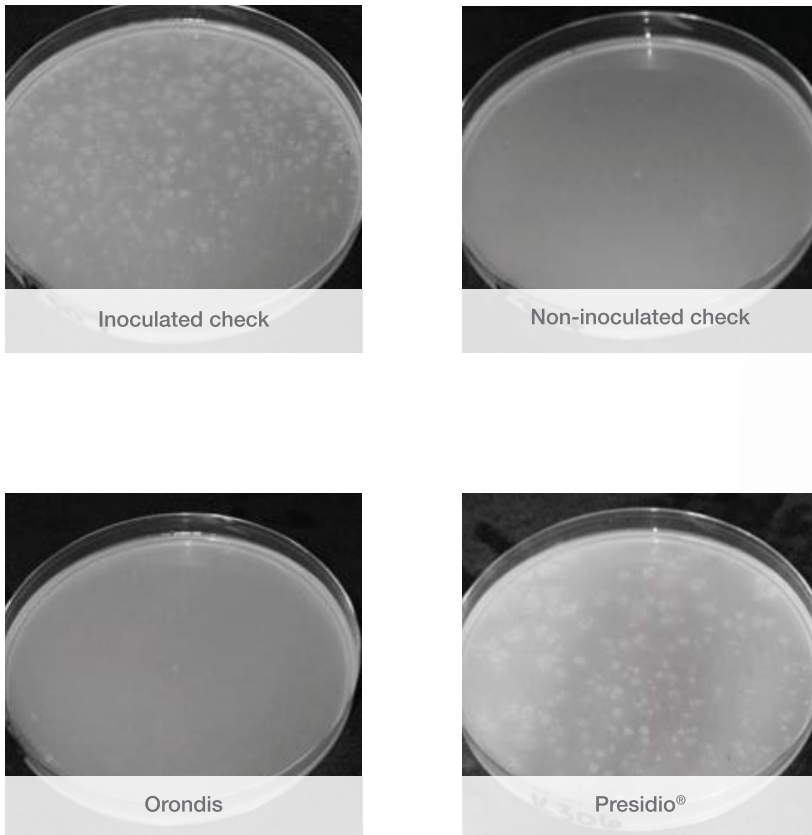


Phytophthora propagules/cm³ soil



Sources: USVF0F6202016; USVF0F6212016

Quantification of viable propagules of P. palmivora in soil at conclusion of trial



Sources: USVF0F6202016; USVF0F6212016





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