

# Oomycete Material Options and Considerations in the Nursery, Landscape, Christmas Trees

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FRAC	Risk of pathogen resistance	Active(s)	Example Tradenames	(Please see each specific label) Notes	Translocation Movement in plant
4	High	Mefenoxam	Subdue Maxx, Subdue GR	<b>See each label.</b> Typically, spring and fall drench applications with total allowable of 6lb/A/year (Subdue Maxx). Foliar, drench, soil directed, soilless media incorporation, and chemigation applications. <b>See label for minimum reapplication intervals for drench applications</b> (ranging from 3 weeks to 4 months). <i>Mefenoxam resistance has been detected in the USA.</i>	<b>Xylem mobile systemic</b> - translocation upwards (acropetal)
P07	Low	Phosphonates. Aluminum tris (O-ethyl phosphonate)	Areca, Aliette, generic fosetyl-Al	<b>See each label.</b> Foliar and drench/soil reapplication interval is 30d or greater. <b>Do not apply group P07 and copper-based fungicides within 14d of one another</b>	<b>Fully systemic</b> - xylem and phloem mobile (amphimobile)
P07	Low	Phosphonates. Mono- and di-potassium salts of phosphorus acid	Alude, Reliant, K-Phite 7LP (newer label)	<b>See each label.</b> Generally, soil drench minimum reapplication interval is 30d and foliar applications, less than. <b>Do not apply group P07 and copper-based fungicides within 14d of one another</b>	<b>Fully systemic</b> - xylem and phloem mobile (amphimobile)
40	Low to Medium	Dimethomorph, Mandipropamid	Stature SC, Micora	<b>See each label.</b> Foliar, drench, soil directed, and chemigation applications.	<b>Translaminar systemic</b> - local translocation
40 + 45*	Medium + High*	Dimethomorph + ametoctradin*	Orvego	<b>See label.</b> Foliar, drench, soil directed, and chemigation applications.	<b>Translaminar systemic</b> - local translocation
21	Medium to High	Cyazofamid	Segway-O, Celoxid SC	<b>See each label.</b> Minimum reapplication interval 14 - 21d. No more than 2 applications per crop cycle. Applied as drench or soil directed.	<b>Protectant</b> - no systemic activity
49	Medium to High	Oxathiapiprolin	Segovis	<b>See label</b> for use restrictions and tank-mix compatibility.	<b>Xylem mobile systemic</b> - translocation upwards (acropetal)
11	High	Fenamidone	Fenstop	<b>See label:</b> Currently only labeled for greenhouses. Field use label is forthcoming. Reapplication interval is 28d	<b>Xylem mobile systemic</b> - translocation upwards (acropetal)
43	Medium	Fluopicolide	Adorn	<b>See label.</b> Foliar, drench, and chemigation applications. No more than 2 applications per crop cycle. Minimum reapplication interval - 14d.	<b>Xylem mobile systemic</b> - translocation upwards (acropetal)
BM02	<i>Unknown (likely low)</i>	Biologicals	Rhapsody (bacteria), Root Shield Plus (fungi)	<b>See each label.</b> Reapplication interval typically very rapid at 3-10d.	<b>Antagonistic</b> - hinders pathogen colonization of host tissues
-	-	Quaternary ammoniums	KleenGrow, Uptake, Physan 20, Green Shield	<b>See each label.</b> Typically used in sanitation efforts, irrigation maintenance (biofilms), and some labels allow for application to plant surfaces. Phytotoxicity concerns are rate and label specific. Generally considered broad spectrum fungi/bacteria/oomycete pesticides.	<b>Direct contact</b> - varying residual activity, no systemic activity
-	-	Hydrogen dioxides	Zerotol, Oxidate		

Disclaimer - Materials represent examples and do not cover all possible control scenarios. Tradenames listed do not imply endorsement and are used as examples only. You must personally refer to, and strictly follow the label for each compound prior to use - Rutgers is not responsible for misused materials or damages thereof. The label is the law. Labels will provide detailed information on where and how the material can be legally used. Additionally, application intervals, compatibility, surfactant use, and other key information is described in detail. Always discuss treatments with your local agents.

**Understanding your materials** – Compounds used to control Oomycetes (Phytophthora, Pythium, Phytopythium) are called Oomycides and are fundamentally different than those used for needlecast (fungi, fungicides). Within available materials there are three main groups, which describe where they will work on the plant given the application technique. Phytophthora management focuses around treating the roots, or providing materials that reach the roots. **Protectants** – are **non-mobile**, meaning they stay exactly where applied, must be root applied. **Xylem mobile systemic** – move upwards, and the roots must be treated. **Translaminar systemics** – move very short distances into tissues, again meaning the roots must be targeted. Finally, the **Amphimobile/Fully systemics** – can move upwards to needles (xylem) and down to the roots (phloem) meaning foliage or roots can be targeted. These are the **P07**.

**Be mindful of water** – Fast drying soils (sandy loam) are less conducive to Phytophthora development than those that are wet or waterlogged (such as clay heavy). Phytophthora (and other root pathogens) often require water for dispersal of their propagules or swimming zoospores and subsequent infection of plant material. This means paying keen attention to not overwatering, mindful of how long tree roots are staying wet, standing water, and locations of water movement or runoff zones. If you are growing more susceptible species, such as true firs (and Douglas Fir), it is important to make sure the field is well-drained in that location. Planting on a gentle slope or mound is preferable in both field and container areas, as this promotes better drainage, evaporation, and airflow. Avoid tightly spaced plants, overgrowth, and high weed densities as this does not allow for adequate air movement (which increase humidity and decreases evaporation). Avoid over irrigation, especially during spring/fall.

**Start clean – stay clean** – Segregation or quarantine of incoming plants is an often-underutilized production practice. This practice alone could stop a pathogen infestation before it ever gets going and should be taken seriously, especially if plants are headed into a field to replace cut trees. Only purchase seedlings from reputable nurseries and make sure to carefully inspect the plants upon delivery. Pay careful attention to the roots and crowns of the seedlings and do not plant any material that is suspicious. It is worth rejecting a few plants than dealing with a perpetual root issue. Keep track of all crop inputs, especially seedling areas. Phytophthora and other fungi can be spread via both above and below ground. *Regular maintenance of equipment, especially used in diseased areas, is critically important.* Cleaning then sanitizing is critical as many sanitizing agents break down rapidly when in contact with organic matter, such plant debris. Consider all non-sterile inputs as potential points of contamination or vectors for disease spread. This is especially true for areas with known histories of Oomycete disease presence.

**Frequent monitoring** is critical to addressing potential issues before they become uncontrollable problems. Scout the fields regularly and train your employees on what they should be looking for, especially in susceptible hosts. Encourage them to report any signs or symptoms that might indicate declining plant health. **Plant health should always be addressed in disease management. Call us!**

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WE **R** HERE WHEN YOU NEED US

**Please take this quick, 5-question survey**

(We really need this for our Phytophthora project)

