

Prevention vs. Eradication - Are your expectations realistic?

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Topics covered

What is prevention?

What is eradication?

What factors are important?

- ✿ **disease characteristics**
- ✿ **product characteristics**
- ✿ **environment or plant characteristics**

Diseases without a significant cure

- Viruses - none of them can be rescued - ever
- Phytophthora - if you see symptoms start it may be too late - initial symptoms to dead plants can be a few days.
- Bacterial diseases - especially crown gall (*Agrobacterium*), fasciation (*Rhodococcus*), wilt (*Ralstonia*) and soft rot (*Erwinia*)
- Fusarium (fungicide may actually make a Fusarium disease worse)
- Black root rot (*Thielaviopsis*)

Keys to a Successful Rescue Operation

Know what the problem is exactly.

Avoid thinking that a biological, green or otherwise soft product will work in a rescue situation.

Fix cultural problems that are promoting the disease.

Use the best products that have been shown to have the most “eradication”.

The Best Eradicants

| Disease | Best eradicator (s) | Cultural changes |
|-----------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Downy mildew | Subdue MAXX FRAC group 40 Phosphonates (impatiens) | <ul style="list-style-type: none"> • Fans to reduce relative humidity (RH) • Irrigate when leaves will dry quickly • Never water at night |
| Pythium root rot | Subdue MAXX (won't work if the pathogen is resistant) Etridiazole | <ul style="list-style-type: none"> • Change irrigation, light level etc. to improve cultural conditions. • Doing this alone can result in "cure". • Plants can outgrow this disease. |
| Phytophthora stem rot | FRAC group 40 | <ul style="list-style-type: none"> • Nothing likely to help once symptoms appear. • Throw away symptomatic plants and treat the rest. |
| Powdery mildew | FRAC group 3 Palladium | Reduce relative humidity (RH) |
| Botrytis | Decree best at killing spores Pageant Intrinsic and Palladium | <ul style="list-style-type: none"> • Reduce RH - water early in the day • Heat and vent at dusk • Keep leaves dry |
| Rust | Heritage FRAC group 11 | <ul style="list-style-type: none"> • Be sure to use a wetting agent or the fungicide may not penetrate the pustule. • Keep leaves dry |
| Anthracnose | Pageant Intrinsic Spectro | Avoid wounding |
| Sclerotinia | Pageant Intrinsic | |

Powdery Mildew Rotation

Eradication likely

- **Compass O, Heritage or Pageant Intrinsic (1 1-strobilurins)**
- **Terraguard, Trigo, Banner MAXX, Eagle, Tourney, Trinity, Torque (3-sterol inhibitors)**
- **Camelot O, Kocide, Phyton 27 (M1-copper)**
- **MilStop (nc-K bicarbonate)**
- **Palladium (1 2 and 9)**

The Best Products for a Rotation

ROTATION

Cercospora Rotation

Eradication possible

- **3336, Fungo, OHP6672 (1-thiophanate methyl)**
- **Medallion (1 2-fludioxonil) or Palladium (1 2 and 9 – fludioxonil and cyprodinil)**
- **Compass O, Heritage or Pageant Intrinsic (1 1-strobilurins)**
- **Daconil Ultrex (M5-chlorothalonil)**

Alternaria Rotation

Eradication possible

- **Daconil Ultrex (M5-chlorothalonil)**
- **Medallion (1 2-fludioxinil) or Palladium (1 2 and 9-cyprodinil)**
- **Compass O, Heritage, Mural or Pageant Intrinsic (1 1-strobilurins)**
- **Banner MAXX, Trinity, Terraguard, Trigo and others (3-sterol inhibitors)**
- **Chipco 26019 (2-iprodione)**

Colletotrichum Rotation

Eradication possible

- **Phyton 27 (M1-copper)**
- **Dithane, Protect, Pentathlon (M3-mancozeb - prevention only)**
- **Daconil Ultrex and Spectro (M5-chlorothalonil - Spectro has eradicant action)**
- **Pageant Intrinsic (1 1 and 7- pyraclostrobin and boscalid - best eradicant)**

Rhizoctonia Rotation

Eradication possible

- **Medallion** (1 2-fludioxinil) or **Palladium** (1 2 and 9-fludioxinil and cyprodinil)
- **Heritage** (1 1-strobilurin) or **Empress** or **Pageant**
Intrinsic (1 1 and 7-pyraclostrobin and boscalid)
- **3336**, **Fungo**, **OHP-6672** (1-tmethyl)
- **RootShield Plus** (nc-Trichoderma harzianum T-22 and T. virens G-41) root rot only and not as an eradicant
- **Affirm** (1 9 – polyoxin D)
- **Chipco 26019** (2-iprodione)

Rust Rotation

Eradication possible with dry leaves

- **Banner MAXX, Trigo, Trinity, Torque, Tourney, Eagle or Terraguard (3-sterol inhibitor)**
- **Compass O, Heritage or Pageant Intrinsic and others (1 1- strobilurins)**
- **Camelot O or Phyton 27 (M1-copper)**
- **Dithane, Pentathlon or Protect (M3-mancozeb) (not effective at eradication)**

Myrothecium Rotation

Eradication possible if plants are not wounded

- **Medallion (1 2-fludioxonil) or Palladium (1 2-fludioxonil and 9-cyprodinil)**
- **Compass O, Heritage and Pageant Intrinsic (1 1-strobilurins)**
- **Daconil Ultrex (M5-chlorothalonil)**

Botrytis Rotation

Eradication possible with environmental changes - also if only flowers are attacked

- **Decree (1 7-fenhexamid)**
- **Daconil Ultrex (M5-chlorothalonil)**
- **Medallion (1 2-fludioxonil) or Palladium (1 2 and 9-cyprodinil)**
- **Chipco 26019, 26GT (2-iprodione)**
- **Pageant Intrinsic (1 1-pyraclostrobin and 7-boscalid) or Orchestra Intrinsic (1 1-pyraclostrobin and 7 - fluxapyroxad)**
- **Mural (1 1-azoxystrobin and 7 - benzovindiflupyr)**

Pythium Rotation

Eradication possible with improved environment

- Empress (11-pyraclostrobin - other FRAC 11 are not as effective)
- Subdue MAXX (4-mefenoxam)
- Segway O (21-cyazofamid)
- Terrazole or Truban (14-etridiazole - can eradicate at high label rates and closest intervals)
- RootShield Plus (nc-Trichoderma harzianum T-22 and Trichoderma virens G-41 - not for eradication)

Sclerotinia Rotation

Eradication possible rarely

- **Medallion (1 2-fludioxonil) or Palladium (1 2 and 9-cyprodinil)**
- **Pageant Intrinsic (1 1-pyraclostrobin and 7-boscalid) or Orchestra Intrinsic (1 1-pyraclostrobin and 7 - fluxapyroxad)**

Bactericide Rotation

Eradication generally not possible

- **Copper** (M1-Camelot O, Kocide and Phytan 27) (effective on most bacteria)
- **Cease** (nc-Bacillus subtilis) (best for Pseudomonas and Xanthomonas)
- **Triathlon BA** (Bacillus amyloliquifaciens) (effective on most bacteria)
- **Agri-Mycin** (antibiotic-streptomycin sulfate) (best for Erwinia)
- **KleenGrow** (nc-quaternary ammonium) (effective on most bacteria)

Thielaviopsis Rotations

Eradication not possible once symptoms appear

- **OHP-6672, 3336 (1-thiophanate methyl)**
- **Affirm (19-polyoxin D)**
and to a lesser degree
- **Heritage (11-azoxystrobin)**
- **Medallion (12-fludioxonil) or Palladium (12 and 9 - fludioxonil and cyprodinil)**
- **Terraguard (3-triflumizole)**

Downy Mildew Rotation

Eradication possible with early infections that are NOT systemic

- **Compass O, Heritage or Pageant Intrinsic (1 1-strobilurins) OR FenStop**
- **Subdue MAXX (4-mefenoxam/tank-mix as directed)**
- **Adorn (43-fluopicolide/tank-mix as directed)**
- **Aliette (33-phosphonate) and many others**
- **Segway O (21-cyazofamid)**
- **Micora (40-mandipropamid), Stature or Orvego (40-dimethomorph and 45-ametoctradin)**
- **Segovis (U15-oxathiapiprolin)**

Phytophthora Rotation

Eradication possible on foliar blight if overhead irrigation is stopped. NO eradication likely with crown rot.

- **Aliette (33-fosetyl aluminum)**
- **Adorn (43-fluopicolide) (tank-mix as directed)**
- **Subdue MAXX (4-mefenoxam)**
- **Micora (40-mandipropamid) or Stature SC (40-dimethomorph)**
- **Terrazole or Truban (14-etridiazole)**
- **FenStop (11-fenamidone)**
- **Segway (21-cyazofamid)**
- **Segovis (U15-oxathiapiprolin)**

Fusarium Rotation

Eradication possible only on leaf spots and root rot with improved conditions

- **Medallion (1 2-fludioxonil) or Palladium (1 2-fludioxonil and 9-cyprodinil)**
- **Heritage (1 1-azoxystrobin) (use as heavy spray to apply at a high enough rate) or Empress (1 1-pyraclostrobin) or Pageant Intrinsic (1 1-pyraclostrobin and 7-boscalid)**
- **Terraguard (3-triflumizole)**



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