

Sustainable Disease Management of Leafy Green Crops in the Home Garden

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INTRODUCTION

Leafy greens are great garden plants as a result of their short seasons, ease of growing, and ability to be succession planted. In wet summers, bacterial diseases, fungal leaf spots, and downy mildew are common problems, while powdery mildew is more common during dry summers. Bacterial diseases are also benefited by hot weather with occasional strong storms, which injure plants and spread pathogens in the garden. Lettuce drop, caused by the *Sclerotinia* fungus, can become a multi-year problem and may spread to different families of plants.

CULTURAL PRACTICES

Choose types of leafy greens based on their time to maturity, cold or heat tolerance, and disease resistance profile, all listed on seed packets. Sow treated or certified seed into well-drained, high organic matter soils that receive full sun. Space plants appropriately to reduce leaf wetness and bacterial and fungal diseases. Once plants have emerged, a light layer of compost, plastic mulch, or newspaper is recommended to reduce weed pressure, maintain soil moisture, and prevent soil contact with leaves. Harvest carefully during the season to avoid injuring neighboring plants.

RESISTANCE

Many lettuces have been bred for resistance to downy mildew. Consider head lettuces 'Kweik,' and 'Pirat,' green leafed lettuces 'Black Seeded Simpson,' and 'Nevada,' and red leafed lettuces 'Galactic,' 'Red Zin,' and 'Rustica' for their additional resistance to bacterial disease and/or white mold. 'Regal' and 'Samish' spinaches are resistant to downy mildew and white rust. Kale, collards, turnip greens, and mustards are naturally less susceptible to many diseases, so variety selection should rely on purchasing certified or treated seed and choosing varieties that will perform well under site and seasonal conditions. Stressed plants are generally more susceptible to disease than those that are not stressed. For additional variety selections, particularly those with resistance to abiotic stresses, see Resources.

USING THE TABLE

The following table focuses on cultural practices aimed at reducing risk of developing diseases of leafy green crops. Cultural practices should be implemented in each plant growth stage, regardless of fungicide program, for optimal disease management. Many cultural practices target multiple diseases, as shown in the table. If disease pressure is high or higher quality produce is desired, growers may consider the fungicides listed in the right-hand column. Organic fungicides (OMRI-approved) are marked with an asterisk (*). All fungicides require excellent coverage of plant tissue and recurrent applications for maximum effectiveness. For best results, most fungicides should be reapplied when residues are no longer visible or on a 10-day interval, whichever happens sooner.

RESOURCES

- Plant Pathology Extension Publications (UK)
<http://www2.ca.uky.edu/agcollege/plantpathology/extension/pubs.html>
- Home Vegetable Gardening (ID-128, UK)
<http://www.ca.uky.edu/agc/pubs/id/id128/id128.pdf>
- Vegetable Cultivars for Kentucky Gardens (ID-133)
<http://www2.ca.uky.edu/agc/pubs/id/id133/id133.pdf>
- Cornell University Tables of Resistant Vegetable Varieties
<http://vegetablemdonline.ppath.cornell.edu/Tables/TableList.htm>
- Oklahoma State University Diseases of Leafy Crucifer Vegetables
<http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-1393/EPP-7666web%20color.pdf>

Time of Year ¹	Growth Stage	Cultural Management	Disease	Crops Affected	Chemical Management ³
March-April (kale, turnips) May (lettuces)	Seeding	Plant treated or certified seed; Practice crop rotation; Plant once soils have warmed; Increase spacing between plants for better air flow; Do not overwater.	Leaf spots ² Damping-off	Collards Kale Mustards, Turnips Greens All greens	Plant treated seed
April-May (kale, turnips) June (lettuces)	Vegetative growth	Remove infected leaves/plants and carry off-site; Remove weeds; Manage insect pests; Do not over water; Avoid overhead watering; Harvest carefully to avoid injuring plants; Avoid working in the garden when plants are wet.	Downy mildew Leaf spots ² Black rot Powdery mildew Lettuce drop (<i>Sclerotinia</i>)	Collards Kale Mustards Turnips Collards Kale Mustards Turnips Greens Collards Kale Mustards Turnips All greens Lettuce	Copper* or phosphorous acid ⁴ Copper* or chlorothalonil Copper* Copper* or sulfur* ⁴ or chlorothalonil --
June-July	End of season	Gather unharvested plant material and destroy; Deep-till any remaining debris.			

¹The growth stage indicated typically occurs during this time of year; however, this may vary from year to year depending on environmental conditions or successional planting.

²Leaf spot diseases may include Alternaria leaf spot, Cercospora leaf spot, White spot, and Anthracnose

³Products approved by the Organic Materials Review Institute (OMRI) for organic production are noted with an *.

⁴Phosphorous acid and/or sulfur dust may injure plants; test on a small area, wait at least 3 days, and inspect for damage prior to treating entire planting. Sulfur may not be labeled for all greens listed here; confirm that the specific plant to be treated is on the product label.

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Photo credit: Matt Barton, UK Agricultural Communications