

## **Foliar diseases in winter greens**

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Several diseases affecting leaves of winter greens have been occurring in the Northeast. Recently, symptoms were seen of powdery mildew on lettuce (Salanova), Cladosporium leaf spot on spinach, and downy mildew on spinach. Other diseases are powdery mildew of brassicas, downy mildew of lettuce, and downy mildew of brassicas.

Managing these diseases successfully can be challenging because there is a very low tolerance for disease symptoms on fresh greens. Thus preventive practices are especially important. With crops already planted this year, the following full management list includes a few practices to implement next season. The key now is to be checking crops for symptoms and reducing humidity and leaf wetness because moisture is favorable for disease development.

- Select spinach varieties with resistance to as many races as possible, in particular 12, 14, and 15 which have been detected in the region in the past. 19 races have been identified to date. Varieties do not have resistance to all races, so select multiple varieties to obtain complete resistance for the planting and ensure some spinach remains healthy. Race-specific resistance is highly effective but only to the specified races. Please report when you see spinach downy mildew and the varieties affected to an extension specialist. We are keeping track of races occurring to be able to keep growers informed of what varieties to grow.
- Treat spinach seed with hot-water or bleach for Cladosporium leaf spot. This is not effective for downy mildew pathogens because their oospores are resilient.
- Rotate where crops are grown.
- Use drip irrigation if possible.
- With overhead irrigation, wait until foliage has dried before putting row covers back on.
- Use ventilation and heat to reduce moisture.
- Control weeds which can add to humidity. Some could be harboring powdery mildew fungi.
- Routinely inspect crops thoroughly for symptoms.
- When symptoms are found at a low level, especially when in one area or variety, consider removing plants and marketing leaves that are symptomless to minimize spread and also loss. Pathogen spores are dispersed in air currents, therefore turn off fans and minimally disturb plants while removing them to minimize dislodging spores, and put plants in a bag rather than a box to take out of the tunnel. Note that there is at least a week from infection until symptoms appear, likely much longer under cool temperatures, so the amount of diseased tissue is greater than is visible.
- Note that the mildew pathogens (downy and powdery) are specific to these crops, so for example, seeing powdery mildew on lettuce in a tunnel is not a potential source of the pathogen for kale being grown there; however, it is an indication that conditions are favorable generally for powdery mildew fungi.
- There are biopesticides and other organic fungicides labeled for most of these diseases. They may contribute to control when applied preventively (so best used on a farm

where the disease has occurred in the past), on a regular basis (every 7-14 days), and in a way to maximize spray coverage on both leaf surfaces.

- Promptly destroy crops as soon as they are deemed too affected by disease to be salvageable. Best to physically remove affected plants from tunnel to minimize crop debris and pathogen left there.

Much has been learned from growers who have had foliar diseases develop on their winter greens. For example, these diseases have not been occurring on all farms and they tend to re-occur on farms suggesting local sources of pathogen inoculum (see the posting about results from a recent survey posted at the webpage cited below). But much remains to be learned, in particular about conditions (temperature and moisture) favorable for development of these diseases so that we can fine-tune management guidelines. Please tell us about occurrences on your farm to help us to be better able to help you!

Images plus additional information about these and other diseases including their management in winter greens are posted at:

<https://www.vegetables.cornell.edu/pest-management/disease-factsheets/diseases-occurring-in-winter-greens-and-their-management/>



Powdery mildew in winter lettuce. Photo credit: Amy Ivy, formerly ENYCHP