Results from Grower Survey about Diseases Occurring in Winter Greens

A web-based survey was set up and announced to growers in early March 2018. There were 33 respondents. Most were during March likely in response to an email sent out through a listserv. There has been since then a link with request to take the survey in a webpage about diseases of winter greens (http://vegetablemdonline.ppath.cornell.edu/NewsArticles/winter-greens.html). The survey questions were about occurrences of downy mildew in spinach, lettuce, and kale and powdery mildew in lettuce and kale during fall, winter, and spring production. Information was asked on number of years producing and occurrence of other diseases.

Based on the responses received, these mildew diseases are not occurring widely and tend to occur repeatedly on a farm. For example: 8 responded downy mildew occurs on winter lettuce every year (6) or most years (2) while only 2 saw less frequently and 12 reported never having seen. Several people responded saw in more than 1 cropping season (fall, winter, spring). But 2 responded only saw in winter crop. With spinach downy mildew, 2 responded saw it in fall, winter, and spring crops at least 3 times. 14 reported never having; 12 of those grow spinach all 3 seasons. This suggests these pathogens might be surviving on some farms. It is also possible occurrence reflects varieties being grown with those growers who have a disease selecting varieties without effective resistance or purchasing seed harboring a downy mildew pathogen.

Occurrence may partly reflect farm-to-farm variation in favorability of conditions. 4 responded they had downy mildew on both lettuce and spinach. The pathogens are different; they do not infect both plants. But high humidity is favorable for both. 9 respondents had only one downy mildew occur on their farm, which could reflect presence of only one pathogen. Similar with powdery mildew: several respondents had powdery mildew on both lettuce and kale. Similar to the downy mildews - different pathogen but similar favorable conditions, which are drier than downy mildews.

**Kale downy mildew** was seen by 4 of 31 growers in their fall crops, 3 of 24 in winter crops, and 1 of 27 in spring crops. Total number of years seen was 10, 10, and 3, respectively. 1 grower reported seeing in all production seasons, but not most years (3 out of 8 or 14). 1 of 2 other growers who saw in fall and winter also grows in spring.

**Lettuce downy mildew** was seen by 14 of 32 growers in their fall crops, 10 of 25 in winter crops, and 8 of 32 in spring crops. Total number of years seen was about 25, 6, and 16, respectively. 6 growers reported seeing every year in their winter crop and 2 most years. 3 saw in all 3 production periods. 7 saw in fall and spring; 3 of them do not grow lettuce in winter. 2 saw in winter but not fall or spring. 8 saw in fall and winter. 8 saw in fall or winter but not spring. 12 growing lettuce all 3 seasons have never seen this disease in any crops.

**Spinach downy mildew** was seen by 6 of 29 growers in their fall crops, 10 of 28 in winter crops, and 5 of 28 in spring crops. Total number of years seen was 8, 4, and 7, respectively. 2 saw in fall, winter, and spring crops at least 3 times. 2 saw in fall and spring, not in winter. 2 saw only
in fall, not in winter or spring. 12 growing spinach all 3 seasons have not seen this disease in any crops. 2 saw none in winter or spring, no fall crop.

**Kale powdery mildew** was seen by 8 of 30 growers in their fall crops, 6 of 24 in winter crops, and 1 of 27 in spring crops. Total number of years seen was 20, 2, and 1, respectively.

**Lettuce powdery mildew** was seen by 12 of 32 growers in their fall crops, 10 of 25 in winter crops, and 6 of 32 in spring crops. Total number of years seen was 15, 5, and 14, respectively.

**Other diseases.** Growers reported also seeing white mold (aka lettuce drop), bottom rot, root rot, Fusarium wilt, and aster yellows in lettuce; damping off, Fusarium root rot, Cercospora leaf spot, and Cladosporium leaf spot in spinach; and Alternaria leaf spot, bacterial leaf spot, and black rot in kale.

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