

Regional Powdery Mildew Management: A Case-Study from Southern Idaho

Bullet-points to put in a sidebar:

- Powdery mildew survives from year-to-year in hop yards only in infected buds, the so-called “flag shoots”
- Thorough crowning and pruning in winter and early spring can substantially reduce or eliminate flag shoots
- Growers that have the most thorough pruning practices make, on average, 1.1 to 1.5 less powdery mildew sprays per year than their neighbors and have better disease control
- Coordinated efforts to ensure thoroughly and synchronized pruning could improve regional management of powdery mildew

Cultural practices in winter and early spring are essential to effectively manage powdery mildew. Buds infected with the powdery mildew fungus can result in the well-known and dreaded powdery mildew “flag shoots” in spring. There are surprisingly few flag shoots present in a typical hop yard. Over the past decade, flag shoots have been found at the rate of about 2 to 4 per acre of susceptible varieties in Washington and only about 1 per 8 acres of susceptible varieties in Oregon. These few bad actors kick off regional outbreaks of powdery mildew because they serve as "point sources" of powdery mildew. Since the sexual stage of the hop powdery mildew fungus isn't known to exist in our region of the world, flag shoots are the only way the fungus survives winter in hop yards....take away flag shoots and powdery mildew outbreaks would be substantially delayed or even prevented.

How well flag shoots are removed has a large effect on powdery mildew development in a yard. There is a stepwise increase in powdery mildew on leaves and cones in yards associated with the amount of green foliage remaining after spring pruning. The severity of powdery mildew on leaves and cones is, on average, three to four-times *higher* in yards that leave some foliage on every hill after pruning vs. yards that leave no foliage. In turn, yards that leave some foliage after pruning are sprayed on average 1.1 to 1.5 *more* times than yards that remove all foliage and stems after pruning.

The bottom-line for management is that thorough and aggressive pruning delays outbreaks of powdery mildew. A very good case study of this can be found in southern Idaho. The growers in that region coordinate their pruning efforts so that it is done very thoroughly and synchronized region-wide. The result is that powdery mildew outbreaks are substantially delayed on a regional basis, and the disease generally isn't even detected until June. Talk to your neighbors. Similar cooperative strategies among growers could be effective in Oregon and Washington too.



A "flag shoot", the means of powdery mildew survival in hop yards in the Pacific Northwest.