



# Monitoring and Management for Downy Mildew in Hops

## Monitoring

- Begin weekly monitoring when plants start growing in spring and until dormancy
- Look for symptoms on leaves, shoots and burrs or cones
- Monitor each variety, especially in areas with a history of high disease incidence
- Walk diagonally through the sections, checking edges and inner areas
- Change the path each time you walk to scout different areas

**When to spray? - If these critical conditions are present, apply a fungicide!**

Critical times for management	Ideal conditions for disease development
Immediately before and after training	High humidity ~ 83%
Lateral branch development	Free moisture ~ At least 4-12 hours
During: <ul style="list-style-type: none"><li>• Bloom</li><li>• Cone development</li><li>• Post-harvest</li></ul>	Mild to warm temperatures ~ 18°C (can still infect at 5°C)

## Chemical control

- Always follow the product label; be particularly aware of long pre-harvest intervals
- Spray preventatively, most fungicides have limited efficacy after infection
- Fungicides applied in the establishment season may reduce future crown infections
- In a field with infection history, spray systemic products early, when first shoots appear. Begin spring pruning after the spray has had time to work into the plant
- Time sprays later in the season with major infection events (see table above)
- Downy mildew can become resistant to fungicides, so rotate chemical groups.

## Cultural control

- Select more tolerant varieties as they vary in susceptibility, although none are fully resistant
- Plant susceptible varieties in dryer areas of the farm
- Plant disease-free material
- Remove all foliage during spring pruning. Prune as late into the season as possible, but balance timing of pruning with training to avoid yield reduction
- Train bines early to minimize soil contact
- Harvest infected yards early
- Do not over-apply nitrogen fertilizer

### Keep up sanitation

- Remove basal spikes weekly to reduce risk of future infection
- Remove and burn infected bines, leaves and crowns, including plant material from pruning
- Clean and disinfect pruning tools regularly

### Reduce canopy humidity

- Remove basal leaves after training and strip leaves off first meter of bines when the plant is  $\frac{3}{4}$  full trellis height, around mid to late June. Do not strip excessively if crop is unhealthy
- Control weeds and cultivate soil, especially post-harvest
- Avoid overhead irrigation
- When planting, space hops ~3.5 feet apart to promote airflow

## Links and Resources

Management and product updates: [onspecialtycrops.wordpress.com/category/hops/hops-pest-management/](https://onspecialtycrops.wordpress.com/category/hops/hops-pest-management/)

PMRA database: [pr-rp.hc-sc.gc.ca/lr-re/index-eng.php](https://pr-rp.hc-sc.gc.ca/lr-re/index-eng.php)

Washington State University field guide: [usahops.org/cabinet/data/Field-Guide.pdf](https://usahops.org/cabinet/data/Field-Guide.pdf)

