Yellow Rust

Phragmidium rubi-idaei

A BC Small-Scale Farmer's IPM Guide- *Guide series, March 2021*

Yellow rust is a fungal disease that is a pest in raspberry crops. It can infect any growing part of a raspberry plant, although it is most commonly found on the leaves. Yellow rust can reduce plant vigour and yield. As with most fungal diseases, yellow rust can become more of an issue during wet growing seasons. This manual contains integrated pest management (IPM) guidelines geared towards small-scale production, but they are applicable to any operation wanting to improve pest identification, monitoring and management.

Identification

Spring-Early Summer

- Bright orange/yellow bumps on top or underside of leaves.
- Older leaves, leaf laterals or flower buds may be infected.
- Orange pustules forming rings, signifying spore release.

Yellow rust pustules

Yellow rust pustules on flower buds

Summer

- Holes burnt through where pustules were located.
- Black spores on underside of infected leaves.
- Undeveloped or dead fruit on infected laterals.
- Orange bumps on infected flower buds.

Post-harvest

- Heavily infected, brittle canes.
- Early leaf drop.

Yellow rust infection progression on raspberry plants

Lifecycle

Dormant season

Spores overwinter on canes and old leaves

September

Spore structures form on underside of infected leaves

Diseased canes are brittle and break off when pruned

May-August

Pustules form on underside of leaves and continue to release spores

Fruit dies if growing on heavily infected laterals

Mid-late April

Spores spread from old infected tissue (cold and wet conditions are conducive to infection)

Older leaves become infected

Early May

Pustules form on upper surface of leaves and begin to release spores

Yellow rust infected plant

How to Monitor

Monitoring is key to determine the ideal time for management of yellow rust, as sprays are timed based on spore release. Check the older, shaded leaves, especially in fields where this disease has been present in the past.

Monitoring Period and Frequency

- Start in late April, monitoring weekly until the end of harvest.

Method

- Small planting: Take a minimum of four samples per planting.
- Large planting: Walk down one to two rows of a field (depending on field size, if larger than 10 rows take two passes), and take one to two samples per acre.
- For each sample:
    - Look at five old leaf triplets for any signs of orange spots.
    - If found, continue to watch for timing of spore release (spots become a ring and look dusty).
    - Watch for fruit infections in heavily infected fields.
- Post-harvest: Walk down rows to identify heavily infected areas.

Record

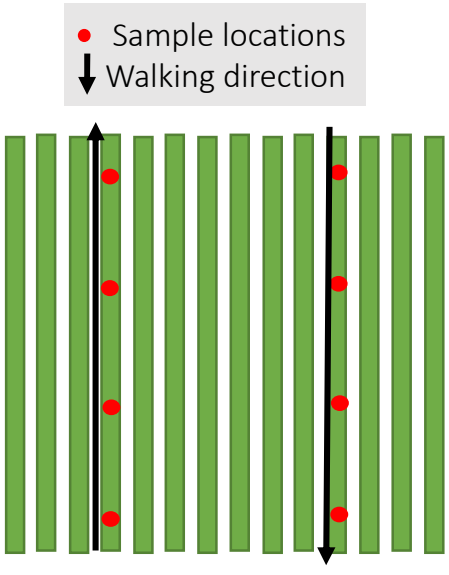
- Keep record of the percentage of infected leaves using a printout of the data sheet template provided in this guide.

Old leaf triplet

Spore release: spots turns into a dusty ring

Location of passes and samples

It is recommended to walk down multiple rows to form a better picture of what is present in the field as a whole. Split up the number of samples equally and do two 'passes' up and down different rows.



When to Act

Threshold

There is no specific action threshold for yellow rust. Low levels of yellow rust have little effect on raspberry plant productivity. Actions are based on disease presence and pressure in a field. If yellow rust pustules have been found at high levels the previous year, begin management once spore release has begun (dusty, ring-like appearance).

Timing of management

- Begin late April-early May for fungicide applications (at start of spore release), apply two to three sprays if this disease is a concern.
- After harvest, prune to remove infected tissue.
- *Note:* Management techniques for this disease are best applied as **preventative actions** rather than to reduce pressure once it has reached high levels.

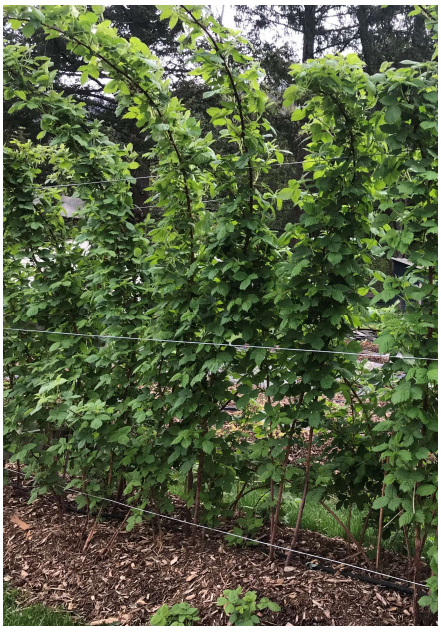
Yellow rust pustules at spore release

How to Manage

The number of management tools available for yellow rust are limited. For this reason, it is very important to pay close attention to timing and thoroughness in implementing these strategies. Choose as many strategies as possible, as they apply to your operations.

Cultural and physical control

- **Tie canes up** soon after foliage has dropped in the fall to allow for good air circulation. Remove or till under heavily infected leaves to prevent infections next spring.
- Plant **summer bearing** raspberries, as fall raspberry varieties are more likely to become infected.
- If severe levels of yellow rust was experienced the previous year, **remove the first flush of infected primocanes** to reduce the initial source of infection.
- **Prune out** heavily infected old fruiting canes as soon as possible after harvest, cutting them flush to the crown. Either remove and burn them or till or rotovate them into the soil help prevent infections the following spring.



Chemical control

- Apply preventatively and use other methods of management before resorting to chemical applications.
- Please refer to **the BC Raspberry Production Guide** for current spray options for yellow rust.
- Always read the label prior to applying any pesticide products.

References and Links:

BC Production Guide – Raspberries
https://www2.gov.bc.ca/gov/content/industry/agriservice-bc/production-guides/berries/raspberries
PNW Handbooks
https://pnwhandbooks.org/plantdisease/host-disease/raspberry-rubus-spp-yellow-rust
Ontario Crop IPM
http://www.omafra.gov.on.ca/english/crops/hort/news/allontario/ao0915a1.htm
University of California - UCIPM
http://ipm.ucanr.edu/PMG/r71101111.html

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Yellow Rust Data Sheet Template

Date	Planting ID	Pass location (row number)	# of samples per pass	# of leaves sampled per pass	# of leaves with YR	Percentage of leaves with YR	Comment
Example row: 05-May-21	*North Field*	*Row 4*	*4*	*20*	*2*	*10%*	*Pustules are open, spore release has begun*