FACTSHEET

Stemphylium leaf blight in onions

Stemphylium leaf blight, caused by *Stemphylium vesicarium,* is a fungal pathogen that affects onions. Spores are spread via wind, rain and contaminated tools or machinery, and survive on plant debris and overwinter in the soil. The fungus presents itself as yellow spots on leaves that expand, causing dieback and reducing yields. Therefore, it's important to detect the disease early and reduce its impact.

Fungicides and level of resistance risk

Active ingredient	Resistance risk level
Fluazinam	Low
Fludioxonil	Low - Medium
Cyprodinil, Pyrimethanil	Medium
Fluopyra, Fluxapyroxad	Medium - High
Azoxystrobin	High

Fungicide resistance management

Cause of resistance: repeated use of same active ingredient/mode of action

Mitigation

- Rotate fungicide modes of action/ FRAC groups
- Reduce number of sprays or switch to biofungicides
- Combine fungicides with cultural controls (e.g. crop residue removal, crop rotation).

Risk management considerations

- Soil/plant DNA testing
- Crop residue reduction or removal
- Management of other host crops/ weeds
- Nutrition management
- Preventative fungicide application
- Annual fungicide sensitivity testing of fungal isolates.

Watch out!

Stemphylium leaf blight can look like other fungal diseases. Be mindful of correctly diagnosing and using suitable control methods.

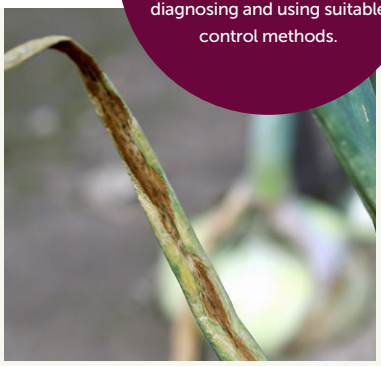
What to look out for

Leaf necrosis

- Necrosis at the leaf tips
- Tan/brown oval lesions on necrotic leaf tips and outer leaves; progressing asymmetrically down the leaf.

Leaf spot

- Tan/brown lesions may appear darker and water-soaked when sporulating
- Black and purple lesions develop on necrotic tissue.



Leaf lesions

- Severe cases (>30%) leaf dieback occurs
- Plants die prematurely and do not lodge normally.

Images © Gossen, B *et al.,* 2021.

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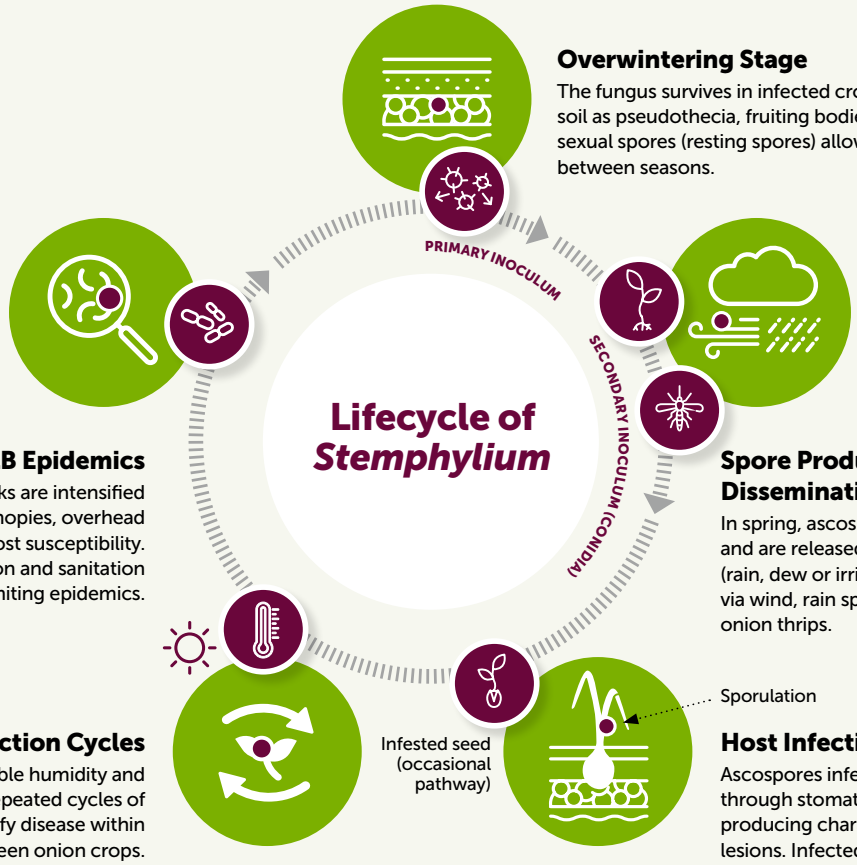
Lifecycle of *Stemphylium*



Overwintering Stage

The fungus survives in infected crop debris and soil as pseudothecia, fruiting bodies containing sexual spores (resting spores) allowing persistence between seasons.

Spore Production and Dissemination Stage

In spring, ascospores develop in debris and are released under wet conditions (rain, dew or irrigation). They spread via wind, rain splash, equipment, and onion thrips.

Host Infection Process

Ascospores infect onion leaves through stomata or wounds, producing characteristic necrotic lesions. Infected tissue generates conidia that drive secondary spread.

Infection Cycles

Under favourable humidity and temperature, repeated cycles of conidia rapidly amplify disease within and between onion crops.

SLB Epidemics

Disease outbreaks are intensified by dense canopies, overhead irrigation, and host susceptibility. Crop rotation and sanitation remain key to limiting epidemics.

Adapted from Hay *et al.* 2022[1]. Image ©AUSVEG

Other host crops

Allium crops
Brassica crops
Spinach & leafy greens
Some cucurbits
Weeds & non-crop hosts

In subtropical climates, there is no true 'overwintering' phase, and the disease can continue to proliferate on crop residues without interruption.

- The fungus 'overwinters' (survives) in infected crop residues, culled onions, and onion debris left on the soil surface. The fungus remains viable in the soil for at least one year.
- Spores (ascospores and conidia) are released from this debris in the following season under favourable conditions (temperatures between 18°C and 25°C and humidity >95% and leaf wetness > 4hrs).
- The disease may be brought in via infected seed.
- Onion thrips may distribute the disease; they create entry wounds for the fungus.
- Crop rotation away from *Allium* species for 3–4 years can reduce soil inoculum levels.

[1] Adapted from Hay, F. et al. 2022. Stemphylium Leaf Blight of Onion. The Plant Health Instructor Volume: 22, 2022, Article Type: Plant Disease Profiles. Accessed via: apsnet.org/edcenter/pdlessons/Pages/Stemphylium-leaf-blight-Onion.aspx.

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Management of Stemphylium

Before planting

Crop rotation

Method

Rotate onions with non-host crops (avoid other Allium crops) for at least 2-3 years to reduce pathogen build-up.

Resistant varieties

Method

Some onion varieties offer moderate resistance to Stemphylium leaf blight. Consider consulting seed suppliers for suitable resistant options.

Farm hygiene

Method

Remove infected plant debris after harvest to avoid pathogen buildup.

In crop

Monitor & scout regularly

Method

Regularly scout and monitor weather conditions that favour disease (warm temperatures & high humidity) to anticipate outbreaks and apply control measures.

Irrigation management and drainage

Method

Choose well-drained paddocks, irrigate early in the day to allow leaves to dry quickly and avoid overhead irrigation at night, if possible.

Nutrition management

Method

Avoid excess nitrogen application, as this can promote lush, disease-susceptible growth. Ensure balanced nutrition management, particularly with potassium and calcium, to improve plant resilience.

Fungicides

Method

Utilise preventative fungicides or at first sign of symptoms, especially under favourable conditions (warm and humid). Rotate fungicides with different modes of action. Fungicides with active ingredients such as azoxystrobin, pyraclostrobin, and boscalid may be used, but label recommendations must be followed.

Factors affecting development and impact of Stemphylium

Lack of rotation with non-host crops	Poor nutritional balance (especially excess nitrogen)
Overnight temps of 4–25°C / day temps of 18–25°C	Poor irrigation management
High humidity	Farm hygiene