Managing diseases of faba bean 2024

Key points

- Faba bean crops require vigilant and proactive disease management to protect yield and ensure high quality, blemish-free seed.
- Select paddocks with minimal soil constraints such as low pH, poor nutrition, compaction and waterlogging.
- Eliminate volunteer faba bean plants over summer/autumn. Control of the 'green bridge' is very important.
- Know the latest disease ratings of your varieties. Variety choice is the best management tool for faba bean diseases.
- Match your fungicide strategy to your varietal resistance.
- Ensure a 4-year break between faba bean crops and sow at least 500 m from other faba bean crops or faba bean stubble.
- Only use high-quality seed with excellent purity, germination and vigour, which is free from diseases, such as ascochyta blight.
- Follow recommended sowing dates and sowing rates for your district. Avoid practices that result in bulky crops that encourage early disease development.
- Use an integrated disease management (IDM) program involving an in-crop fungicide strategy and non-chemical management practices.
- The timing of fungicide application is critical, especially at pre-canopy closure.
- Inspect crops every 7–10 days for the appearance and progression of disease symptoms.
- The most effective fungicides are preventative and applied prior to forecast rainfall.
- Ensure you have adequate resources to manage the area sown to faba bean (i.e. equipment, fungicides and labour) prior to rainfall. Consider the logistics of foliar fungicide applications.
- Correct disease identification is necessary to avoid unnecessary and/or incorrect fungicide applications (Figure 1, Table 3).
- Consult a NSW DPI expert for further information on disease identification and management.

Figure 1 Chocolate spot lesions on faba bean leaf and flower.

Faba bean in 2024

Faba bean volunteers and the 'green bridge':

Wet summer conditions have been challenging for timely fallow spraying, increasing the likelihood of volunteer faba bean plants being present. These plants offer a 'green bridge' for some pathogens and act as a refuge for insect pests, such as aphids, that spread virus.

For more information on varietal differences in disease resistance and tolerance, see Table 2 or head to NVT Disease Ratings | NVT (grdc.com.au)

Major diseases

Chocolate spot

Chocolate spot (*Botrytis fabae*), is the most important fungal disease affecting faba bean. It can infect stems, flowers and pods. It can cause minor losses through to crop failure quickly in unprotected crops under favourable conditions. The disease is favoured by seasons or conditions resulting in bulky crops and high leaf moisture or humidity (>70%) over 4–5 days. The optimal temperature range for disease development is 15–28°C. The disease can spread within 4–5 days of infection. Infection levels decline sharply when humidity levels decrease and/or maximum daily temperature exceed ~28°C. The greatest risk period is normally from late July to late October during canopy closure and flowering.

The disease is first seen as reddish to chocolate brown, slightly flattened spots appearing on lower leaves. This is the 'non-aggressive' phase, which is thought to have little effect. When mild, wet conditions persist for several days in late winter and spring, the disease will spread quickly and become 'aggressive'. The disease progresses up the canopy (Figure 2), with the spots rapidly expanding into grey-brown large lesions and can lead to the entire plant becoming affected (Figure 3). Plants can defoliate and lose flowers and pods. Stems can become reddish-brown and weakened and plants can lodge making harvest difficult.

Flowers and pods may also develop lesions (Figure 4), flowers are particularly vulnerable to infection. Young leaves expanding at the top of the plant may outgrow the disease if conditions dry out. Lost flowers and pods cannot be recovered. Small black sclerotia may sometimes be found formed on the surface of infected plant parts, including petioles and stems.

Seed from badly affected plants may have a reddish-brown stain, which lowers its market value.

Chocolate spot has various forms of disease transmission as set out in Table 1. The fungus may survive in the soil as sclerotia, on stubble, on infected seed or on volunteer plants (ie 'green bridge'). Spores from previous crops stubble are wind borne and travel long distances.

Figure 2 Chocolate spot. Photo: Pulse Australia.

Figure 3 Severe chocolate spot to the top of the canopy. Photo: Pulse Australia.

Figure 4 Chocolate spot infection on faba bean flower.

Faba bean rust

Faba bean rust (*Uromyces viciae-fabae*) is of most concern in northern NSW. It can occur very early in early sown crops, but normally from mid-spring onwards when warm (above 20 °C) and humid conditions prevail. The disease does not require extended wet periods and infections can occur after only 6 hours of leaf wetness. Rust has a longer latent period than the other major diseases (10 days with optimal temperatures ~20 °C). Infections can remain without symptoms during cold weather and break out suddenly when temperatures rise.

Severe infections may cause premature defoliation, resulting in smaller grain at harvest. The disease can cause losses of up to 30% in unprotected, rust susceptible varieties.

The disease is first seen on leaves as small, light green spots about 1 mm in diameter which erupt into red powdery, rusty lesions (Figure 5). These increase in time to densely cover the leaf surface (Figure 6), and later to develop on the stems (Figure 7).

Stubble borne infection of this disease is through the sexual stage. Teliospores on stubble cause pycnia infections that after fertilisation cause aecia infection. In most cases the infection is airborne from volunteers or other crops.

Volunteer faba bean plants can host the disease over summer. Disease transmission mechanisms are set out in Table 1.

Figure 5 Early rust lesions on faba bean.

Figure 6 Severe rust infection on faba bean.

Figure 7 Rust on a faba bean stem.

Table 1 Diseases of faba bean, optimal climatic conditions, varietal resistance and transmission mechanisms.

Disease	Ascochyta blight	Viruses	Chocolate spot	Faba bean rust	Sclerotinia stem rot	Cercospora	Root lesion nematodes
Causal organism	*Ascochyta fabae*	Mutiple	*Botrytis fabae*	*Uromyces viciae-fabae*	*Sclerotinia sclerotiorum*	*Cercospora zonata*	*Pratylenchus thornei, P. neglectus*
Hosts	Faba bean	Pulses and legumes*	Faba bean	Faba bean	Most broadleaf crops^	Faba bean	Crops differ in their susceptibility to RLN
Optimal climatic conditions	Cool: 5–15 °C Wet conditions	Variable	Warm: 15–25 °C Humidity >70% RH for 4–5 days	Warm: > 20° Wet conditions	Cool, wet conditions	Early season, cold and wet	N/A
Varietal resistance	Yes	Yes	Yes	Yes	No	No	Yes**
Spread via							
Seed	Yes	No	No	No	Yes^^	No	No
Stubble	No	No	Yes	Yes	Yes^^	Yes	No
Soil	No	No	Yes	Yes	Yes^^	Yes	Yes
Wind borne/ rain splash	Yes	No	Yes	Yes	Yes	Yes#	No
Green bridge	Yes	Yes	Yes	Yes	?	No	No

* primarily spread by vectors such as aphids

** all varieties resistant to *P. neglectus* but differ in their susceptibility to *P. thornei*

^^ via sclerotia in the seed, stubble and soil

via conidia

Table 2 The 2024 NVT faba bean variety disease ratings. NVT Disease Ratings | NVT (grdc.com.au).

Variety	Year of release	Disease resistance rating				
		Ascochyta blight	Cercospora	Chocolate spot	*Pratylenchus thornei*	Rust
Dozaϕ	2008	VS	S	S	MSS	MR
FBA Aylaϕ	2021	–	S	S	MRMS	MR
Nuraϕ	2005	MR (P)	S	MS	MS	VS
PBA Amberleyϕ	2019	MR	S	MRMS	MRMS	VS
PBA Bendocϕ	2018	MR	S	S	MRMS	VS
PBA Marneϕ	2018	MS	S	MS	MS	MRMS
PBA Nanuϕ	2018	–	S	S	MRMS	MR
PBA Nasmaϕ	2015	S	S	S	MSS	MRMS
PBA Ranaϕ	2011	MRMS (P)	S	MS	MS	VS
PBA Samiraϕ	2014	MR (P)	S	MS	MRMS	S
PBA Wardaϕ	2012	S	S	S	MRMS	MRMS
PBA Zahraϕ	2015	MRMS	S	MS	MRMS	S

VS = very susceptible; S = susceptible; MS = moderately susceptible; MSS = moderately susceptible to susceptible; MRMS = moderately resistant to moderately susceptible; MR = moderately resistant.
(P) = provisional rating.

Cercospora

Cercospora (*Cercospora zonata*), like ascochyta blight (AB), develops early in the season during wet and cold conditions, but is less damaging to the crop than AB. The disease mainly affects lower leaves, but can also affect stems and pods in severe cases. Lesions initially form on lower leaves early in the growing season, then expand resulting in severe blighting of the leaf.

The disease originates from soil-borne inoculum and previously infected plant material and only appears in paddocks previously sown to faba bean or adjacent paddocks. Lesions occur close to the ground on the lower third of the plant as the disease is driven from infected debris in the soil. In favourable conditions, the disease spreads to the upper canopy later in the season and if not controlled, extensive defoliation and lesions on the pods may result but this is rare.

First time faba bean growers with a low frequency of faba bean production will rarely observe the disease. Spread during the season is by conidia that dislodge from short white spore clumps on the lesions surface. The various forms of disease transmission of cercospora are in Table 1.

Symptoms of AB and chocolate spot can be confused with cercospora, but the cercospora leaf spots tend to be darker than those of chocolate spot, with irregular-shaped edges and a possible ring pattern. Within the spots a concentric ring pattern can often be seen (Table 3). Unlike AB, no pycnidia (fruiting bodies) are produced.

Ascochyta blight (AB)

Ascochyta blight (*Ascochyta fabae*), tends to develop under prolonged wet, cool conditions (5–15 °C) and earlier in the season than chocolate spot. It is more of a problem in the colder, southern areas of NSW.

The initial symptoms are lesions on the leaves and stems of young plants. A distinguishing feature is fungal fruiting structures or small black dots (pycnidia) visible within the centre of lesions. Lesions often have a concentric zonal appearance. Infected seedlings may deteriorate quickly and affected plant parts above the lesion may break off, making symptoms difficult to detect.

Damage from stem infection often results in serious crop lodging in susceptible varieties. Pod infection with AB can cause seed staining and the subsequent downgrading of grain.

Ascochyta blight has various forms of disease transmission as set out in Table 1. Seed transmission is an important method of infection and seed treatment with appropriate fungicides can be beneficial in AB favourable environments.

Good levels of AB resistance are available in faba bean varieties (Table 2), but check crops regularly for disease symptoms

Figure 8 AB lesions on a faba bean leaf. Photo: Pulse Australia.

Minor diseases

Alternaria

Alternaria leaf spot (*Alternaria alternata*), is a minor disease of faba bean which occurs late in the season and can be confused with chocolate spot. Alternaria control is rarely warranted.

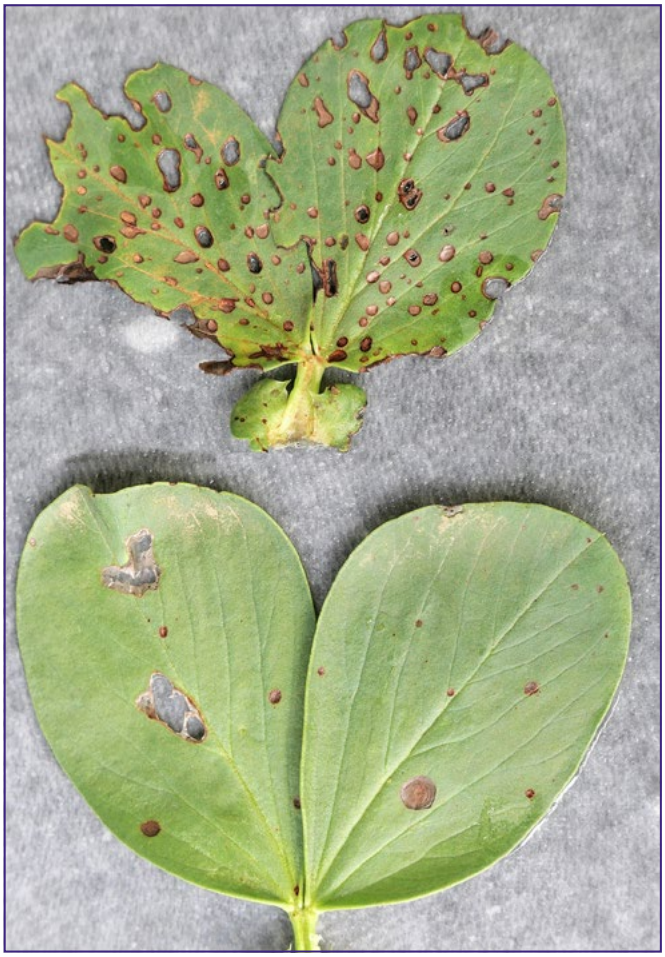

Figure 9 Alternaria lesions on faba bean leaves.

Stemphylium blight

Stemphylium blight (*Stemphylium* spp.) is favoured by very wet years and is unlikely to become a major issue during normal seasons.

The blight is characterised by large grey-black necrotic lesions restricted to leaves only, often starting from the leaf edge.

There is little information on the value of different fungicides, however fungicide applications used for disease control in wet seasons will assist in the control of stemphylium.

For more information: Stemphylium blight in faba bean in 2016 | NSW DPI (nsw.gov.au)

Figure 10 Stemphylium blight on faba bean.

Table 3 Summary of differences between the symptoms of the main faba bean diseases in NSW.

Disease	Ascochyta blight	Chocolate spot	Rust	Cercospera
Leaf symptoms–early	Lesions often have a concentric zonal appearance	Red-chocolate brown, slightly flattened spots on lower leaves	Small, light green spots about 1 mm in diameter	Lesions (1–5 mm) first appear on the lower leaves ~7 weeks after sowing
Leaf symptoms–late	Fungal fruiting structures or small black dots (pycnidia) visible within the centre of lesions	Spots expanding rapidly into grey-brown large patches	Spots erupt into red powdery lesions	Spots form a concentric ring pattern. Severe blighting of large portions of the leaf. No pycnidia
Photo	 Photo: Pulse Australia	 Photo: Gordon Cumming	 Photo: NSW DPI	 Photo: Rohan Kimber

Crop monitoring

- **Regular observation** – inspection, identification, and observation recording every 7–10 days.
- **Visual inspection** – place markers within crops and use a phone camera if necessary to record symptom development. Effective crop monitoring should include a range of locations in the paddock.
- **Record distribution** – both across the paddock and vertically up the plant. Are symptoms spread uniformly across the paddock, in patches or related to topography or a change in soil type? Are symptoms in the lower canopy, at a specific leaf number/development stage, or throughout the canopy from top to bottom. These observations can help identify or eliminate issues.
- **Knowledge of disease symptoms** is important. If in doubt, contact NSW DPI plant pathologists for help.

Disease development increases following canopy closure. Rainfall events throughout late winter-spring favour foliar disease development and spread. When conditions are dry disease progress will slow down.

Foliar fungicides

The use of fungicides is essential in managing foliar diseases of faba bean (Table 4). Fungicide application is a standard practice in high rainfall regions, irrigation districts, in wet years or in high disease risk situations.

There are 3 protection periods for monitoring disease development and fungicide application.

First protection period

5–8 weeks after emergence.

If cercospora is present, control is most effective at this time. Management of AB should be a priority for susceptible varieties such as Nasma$^{\Phi}$ and Doza$^{\Phi}$. Fungicide choice depends on the target disease. Always check fungicide labels as not all fungicides are effective against all diseases.

Second protection period

During flowering (13–16 weeks after emergence) for protection against disease prior to canopy closure.

Control during this time allows effective fungicide penetration deep into the canopy to protect lower leaves. Protection is critical at this time as disease can affect yield through leaf lesions, flower drop and pod abortion.

Chocolate spot is most damaging at flowering and pod set, so fungicide application at early to mid-flowering, before symptoms appear, is recommended. Ascochyta blight should again be targeted in susceptible varieties if necessary.

Apply the appropriate fungicide(s) to crops with high yield potential when:

- rain events are likely
- canopy closure is imminent
- disease (AB, chocolate spot, rust) symptoms are present and susceptible varieties are being grown.

Fungicide mixtures may be required to control multiple diseases in some varieties in some years, especially when using older generation products. Newer generation fungicides are broad spectrum and do not require a mixing partner. Additional fungicide applications may be required in high disease pressure situations.

Crops are at high disease risk when:

- sown early, producing a bulky canopy
- in a high rainfall area
- subject to frequent spring rains
- the disease is established in the lower canopy.

The most effective fungicides are preventative and should be applied prior to forecast rainfall.

Third protection period

End of flowering when pods are filling (15–20 weeks after emergence).

Chocolate spot must be controlled in favourable disease conditions during this period. Rust may need to be controlled if it has become established in the crop as epidemics can form rapidly. The control of AB is also important in susceptible varieties at this time. Monitor crops frequently to track disease progress, especially if rainfall is forecast and significant new growth has occurred since the previous fungicide application.

Seed staining from AB and chocolate spot is a major problem when wet weather persists to harvest. Some seed staining can be caused by weathering and delayed harvest. This staining will not be reduced by fungicide application. Fungicide can be applied until just prior to the crop drying down, but be aware of withholding periods.

Always read the label, follow directions for use and use only registered products or products under permit. Overuse of fungicides or not following directions for use can jeopardise export markets.

Fungicide application

- Preventive fungicides are the most effective against disease establishment and the lowest cost.
- Seed applied fungicides are generally not recommended for faba bean as these can harm rhizobia. When fungicide treated seed is used, it is important that the rhizobia inoculum is applied shortly before sowing.
- Be aware of the protection period of different fungicides. This can vary from 10–14 days for older protectant products to 4–6 weeks from newer semi-systemic products. Seasonal conditions and disease pressure may reduce protection periods and require additional fungicide applications.
- Monitor weather events and be prepared to apply foliar fungicides before forecast rainfall. Suitable spray days may be limited. Consider the logistics of fungicide application, including availability of fungicide products and spraying equipment. Where possible have aerial application booked in advance as a backup.
- Use high water rates (preferably 100 L/ha by ground rig or 30 L/ha by air) for good coverage and canopy penetration.
- If necessary, apply foliar fungicides in light rain or when dew is present. The presence of water on the leaf surface can assist in product spread over the leaf surface.

Table 4 Foliar fungicides for faba bean

Example trade name^ (active ingredient)	Unit	Application rate per ha^^					Aerial application
		Ascochyta	Chocolate spot	Cercospora	Rust	Sclerotinia	
Aviator® Xpro® (prothioconazole 150 + bixafen 75)	L	0.4–0.6	0.6	0.4–0.6	0.6	–	Yes
Bravo® Weather Stik (chlorothalonil 720)	L	–	1.4–2.3	–	1.4–2.3	–	Yes
Dithane® Rainshield® NeoTec® (mancozeb 750)	kg	1.0–2.2	1.0–2.2	1.0–2.2	1.0–2.2	–	Yes
Miravis® Star (fludioxonil 150 + pydiflumetofen 100)	L	0.25–0.50	0.75–1.00	0.75–1.00	–	0.75–1.00	Yes
Orius® (tebuconazole 430)	mL	–	–	145	145	–	Yes
Spin Flo®, Carbendazim 500 SC* (carbendazim 500)	mL	–	500	–	–	–	No
Veritas® Opti (tebuconazole 370 + azoxystrobin 222)	L	0.40–0.54	0.40–0.54	0.16	0.16	–	Yes

^ other products may be available at different concentrations

^^ refer to label for maximum number of sprays per season

* carbendazim remains a legally permitted treatment in Australia. However, pulse growers are advised to talk to their grain buyer prior to the use of carbendazim. For more information: Paddock Practices: Carbendazim fungicide and its continued use in Australia | GRDC

Viral diseases

Viral diseases in faba bean occur throughout NSW. Levels of infection often relate to high aphid activity early in the season due to late summer rains and an abundance of pasture legumes or volunteer faba bean plants. Aphids can transmit a range of viruses.

Recently released varieties have greatly improved resistance compared with the older varieties.

Virus in faba bean

Bean leafroll virus (BLRV)

The most significant faba bean virus in Australia's northern grain region. It is persistently transmitted. Early infection causes stunting and plant death (Figure 11).

Bean yellow mosaic virus (BYMV)

A non-persistently transmitted virus, generally develops towards the end of the season and has a limited impact. However, early infections in autumn can cause severe damage (Figure 12).

Turnip yellow virus (TuYV)

Formerly known as *Beet western yellows virus*, TuYV can reach high infection levels in faba bean crops towards the end of the season. Unlike other pulse crops (chickpea and lentil), it does not cause severe symptoms and is persistently transmitted.

Soybean dwarf virus (SbDV)

Also known as *Subterranean clover red leaf virus*, SbDV has similar symptoms to BLRV and is a non-persistently transmitted virus.

Alfalfa mosaic virus (AMV)

Lucerne paddocks and medic stands are sources of AMV infection, a non-persistently transmitted virus. Combined infection by BYMV and AMV can be lethal.

Subterranean clover stunt virus (SCSV)

Symptoms of SCSV are similar to BLRV and SbDV, but high incidences are rare. The virus is persistently transmitted.

Pea seed-borne mosaic virus (PSbMV)

Rarely seed transmitted in faba bean, PSbMV induced seed staining is only found if the crop is grown close to PSbMV infected field pea crops. The virus is transmitted non-persistently.

For more information on viruses in pulses:
Managing viruses in pulse crops in 2021 | NSW DPI (nsw.gov.au)

Management

- **Retain standing cereal stubble** to deter aphids during the early vegetative stage of the crop.
- **Using recommended sowing rate** of good quality seed to promote early canopy closure.
- **Separate** faba bean crops as much as possible from lucerne or clover and medic pastures, which can act as reservoirs for aphids.
- **Control volunteer faba bean plants** (green bridge) over summer months.
- **The seed-applied insecticide** imidacloprid will provide early control of aphid feeding and prevent infection from persistently transmitted viruses. Imidacloprid will not prevent the infection by non-persistently transmitted viruses. However, the treatment could slow aphid multiplication in the crop during early growth and limit secondary infections.

Research on controlling aphids in crops and reducing virus transmission through insecticide application is continuing; no clear thresholds have yet been determined for the different viruses and the type or number of aphids infesting faba bean crops.

Figure 11 BLRV virus infected plants in the foreground are stunted and chlorotic compared to healthy plants in the background.

Figure 12 BYMV infected faba bean plant (right) compared with healthy plants.

What else could it be?

Root-lesion nematodes (RLN)

Root-lesion nematodes are microscopic, worm like animals that extract nutrients from plant roots. Roots are damaged as RLN feed and reproduce inside them. *Pratylenchus thornei* and *Pratylenchus neglectus* are the most common RLN species in Australia, with *P. thornei* the most common species in northern NSW. They attack both cereals and pulses. Severely affected plants are stunted and may have some yellowing but often have no obvious foliar symptoms. Roots are generally shorter with fewer root hairs. Optimum soil temperature for the proliferation of RLN is in the range of 20–25 °C.

Faba bean cultivars range from moderately susceptible to very susceptible to *P. thornei*. Faba bean are resistant to *P neglectus*.

Know the disease levels in your paddock using a Predicta® B test. Predicta B (broadacre) | PIRSA

Insects

Red-legged earth mite (*Halotydeus destructor*)

Red-legged earth mite damage can be mistaken for chocolate spot. The damage starts as silvery patches which become red-brown, similar in colour to chocolate spot but form large, irregularly shaped areas. Damage usually occurs at the seedling stage.

Faba bean aphid (*Megoura crassicauda*)

Faba bean aphid was first recorded in north-west NSW in 2017. Faba bean aphid multiplies extremely quickly and these high numbers can cause plant damage that may be mistaken for a disease (Figure 13). They can also transmit BLRV.

Figure 13 Faba bean aphid causes damage that may be mistaken for a disease.

For more information: Aphid management in pulse crops | NSW DPI (nsw.gov.au)

Other factors

Other factors can cause damage to faba bean that may be confused with diseases symptoms. These can include frost (Figure 14), herbicide residues (Figure 15) or spray drift, and nutritional disorders (Figure 16) .

Figure 14 Frost damage in faba bean.

Figure 15 Balance® herbicide damage in faba bean. Photo: Tony Cook.

Figure 16 Nitrogen deficiency caused by poor rhizobia nodulation in faba bean. Photo: Tim Weever.

Contacts

Tamworth Agricultural Institute

Joop van Leur,
Pulse Pathologist, Viruses and Faba Beans
M: 0427 928 018
E: joop.vanleur@dpi.nsw.gov.au

Wagga Wagga Agricultural Institute

Kurt Lindbeck
Senior Pulse and Oilseed Pathologist
P: 02 6938 1608
E: kurt.lindbeck@dpi.nsw.gov.au

Mark Richards
Pulse Research Agronomist
M: 0428 630 429
E: mark.richards@dpi.nsw.gov.au