

New Zealand Beet Diseases



We're with you in the field cropscience.bayer.co.nz/escolta



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MAXIMISE YIELD AND RETAIN CROP PALATABILITY

The perfect crop. Yes, profit is important, and that's why you're in business. But it's not just that, is it? It's about the pride your crops bring you, about improving on last season, constantly fine tuning, seeking higher yields and improving productivity. Simply getting satisfaction from being able to say... "we grew that!"

The large area of fodder beet now grown in New Zealand is under an increasing threat from disease infection. Globally, a number of diseases attack fodder beet or other beet species, and it is likely that in time we will see some, or all of them, here. In fact, beet rust, beet powdery mildew, cercospora, ramularia leaf spot and rhizoctonia root rot are already established in New Zealand. As well as reducing yield, disease infection also reduces the quality and palatability of fodder beet leaves, an important food component of the crop. In the following pages; key beet diseases from around the world are illustrated to help you look out for these unwelcome guests.



Key diseases in beet crops.

Cercospora leaf spot

Powdery mildew





1 CERCOSPORA LEAF SPOT (Cercospora beticola)



MAIN HOST

Fodder and sugar beet.

SYMPTOMS

First symptoms are individual circular leaf spots (3-5 mm). Spot centres are light brown with darker-brown to reddish-purple borders. Black sporulating spots can be seen (with magnification) under high humidity conditions. With disease progression, spots will coalesce, with leaves turning yellow and then brown while remaining attached to the plant.

LIFE CYCLE

Cercospora leaf spot survives on plant debris, some weed host species and in seed. Spores are produced in the spring and these are distributed by wind and rain splash.

WEATHER CONDITIONS

Higher temperatures and humid conditions are ideal for disease development.

Cercospora leaf spot is the most damaging beet disease economically. Disease epidemics can result in complete loss of crop leaves, reducing leaf and bulb yields.

CONTROL

Escolta has a label claim for the control of Cercospora leaf spot.



Early symptoms of Cercospora

Cercospora mature infection

TECHNICAL UPDATE: In 2018/19, Cercospora resistance to Qol fungicides was found in beet crops in a small number of NZ locations. If Cercospora resistance is present in your crop, and conditions favour disease development, Escolta may not always provide control, but it will continue to control other important diseases, leading to profitable yield increases. For more information, go to cropscience.bayer.co.nz/escolta

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2 POWDERY MILDEW (Erysiphe betae)



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MAIN HOST

Fodder and sugar beet.

SYMPTOMS

Powdery mildew first appears as small surface patches of white, fluffy mycelium. The first symptoms are usually found on the underside of older leaves but it can rapidly spread so that the entire plant appears greyish-white.

LIFE CYCLE

To overwinter, powdery mildew must have living beet material (fodder beet, sugar beet, spinach, swiss chard etc.) to survive. In the spring, wind

borne spores are responsible for the infection of new crops with periods of humidity and temperatures of around 25°C being ideal.

WEATHER CONDITIONS

Hot, humid conditions, but without moisture present on the leaves are optimum for disease development.

Severe attacks can significantly reduce the yield and feed value of fodder beet. Overseas, sugar beet yield losses of up to 35% have been recorded.

CONTROL

Escolta has a label claim for the control of powdery mildew.



Powdery mildew is now commonly seen in NZ

Powdery mildew infection







MAIN HOST

Fodder and sugar beet.

SYMPTOMS

Small circular (1-2 mm) raised pustules that are red-orange or brown colour. They can be found on both sides of the leaf and leaf stalk and usually have a yellow halo.

LIFE CYCLE

To overwinter, beet rust must have living beet material (fodder beet, sugar beet, spinach, swiss chard etc.) to survive. From early spring the beet plant is susceptible to attack by beet rust, but

it is the late season attack that has the greatest effect. In the late summer or early autumn, beet rust can increase very quickly, causing older leaves to wilt and die.

WEATHER CONDITIONS

Disease development is favoured by cool (16-20°C), moist weather.

Reduces the palatability of leaves and in Europe, beet rust infections have been shown to lead to moderate yield reductions in sugar beet.

CONTROL

Escolta has a label claim for the control of beet rust.



Rust is currently the most commonly seen fodder beet disease in New Zealand

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BACTERIAL LEAF SPOT (Pseudomonas syringae pv. aptata)

MAIN HOST

Fodder and sugar beet.

SYMPTOMS

The first symptoms are small, brown irregular spots with a very dark border. Similar to those produced by Cercospora, the dark border and lack of spore bodies is diagnostic. As the disease progresses the leaf spots join together between the leaf veins to produce large, dead areas.

LIFE CYCLE

The main bacteria that causes bacterial leaf spot is a common soil dwelling pathogen. It is able to infect the plant through the leaf stomata, plant wounds and through natural openings along the leaf edges. Spread is via heavy rain or mechanical means.

WEATHER CONDITIONS

Warm moist conditions favour the development of this disease. A temperature between 23-28°C is optimal but it can develop when temperatures are close to freezing.

Economic losses can occur through a reduction in dry matter content and reduced quality and palatability of leaves.

CONTROL

Currently within New Zealand no fungicides/ bactericides are registered for the control of bacterial leaf spot in fodder beet.



Bacterial leaf spot infection

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5 ROOT AND CROWN ROT (Rhizoctonia solani)

MAIN HOST

Fodder and sugar beet.

SYMPTOMS

Early infections result in browning of leaves and plant deaths resulting in gappy crops. Bulb infections can occur through the crown or the root tip. Infections cause dark oval lesions which spread and often coalesce with cracks and distortion of the bulb occurring. Root tip infections move up the bulb causing internal rotting.

LIFE CYCLE

Rhizoctonia survives in the soil and on plant debris. Poor crop rotations, alternative hosts

such as weeds and factors that increase plant stress such as poor soil structure, all increase the risk from Rhizoctonia. Adopting good husbandry practices, especially ensuring good, free draining seedbeds are prepared, and minimising soil contact with the petioles and plant crown will help control this disease.

WEATHER CONDITIONS

Warm, moist soil conditions favour the development of this disease.

Economic losses can occur through both a reduction in yield, dry matter content, root quality and storage longevity. Yield losses of 50% have been recorded.

CONTROL

Currently within New Zealand no fungicides are registered for the control of root and crown rot in fodder beet.



Beet seedling infected with Rhizoctonia

Rhizoctonia root rot

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Infection with Rhizoctonia leads to plant death and gappy crops





MAIN HOST

Fodder beet.

SYMPTOMS

First seen as light brown angular spots (4-7 mm in diameter) on older leaves. When mature, these spots have a dark brown-reddish margin with silvery-white centres. Under magnification, white sporulation can be seen. Infected leaves turn yellow, become necrotic and die.

LIFE CYCLE

Survives on infected crop residue. Spores are

spread by wind and splash dispersal. Infections occur at high humidity and mild temperatures (17-20°C).

WEATHER CONDITIONS

Favoured by wet, humid and mild weather conditions.

Ramularia can cause significant defoliation if persistent favourable climatic conditions occur.

CONTROL

Escolta has a label claim for the control of Ramularia.





Early Ramularia infection

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MAIN HOST

Fodder and sugar beets.

SYMPTOMS

Globally, there are a number of beet-yellowing virus diseases, with the symptoms being difficult to differentiate in the field. Beet yellows virus (BYV) is the most common, and considered to be the most yield limiting. Symptoms are yellowing of the leaves between the veins, which can then spread through the entire leaf. Leaves can become thicker and then brittle. Symptoms can be similar and may be confused with mineral deficiencies. Beet yellowing viruses are transmitted by aphids.

ECONOMIC IMPACT

Can be yield limiting, and reduce leaf quality and palatability.

CONTROL

Controlling aphids (the vector) will limit virus spread. In Europe, seed treatment and foliar insecticides are used to control aphids. In New Zealand, Attack[®] has a label claim to control aphids in fodder beet.



Beet yellow virus infection

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PRODUCT INFORMATION





Escolta is a co-formualtion that controls the four most commonly seen foliar diseases in beet crops – rust, powdery mildew, Cercospora and Ramularia leaf spot. Escolta, through controlling leaf diseases, will maximise green leaf retention but also provide physiological effects resulting in improved greening and yield benefits.

PRODUCT RESOURCES >

CONTROL LEAF DISEASE & INCREASE YIELDS

Trials in commercially grown farm fodder beets crops, during the 2016/17 season, clearly demonstrated the increases in yields that an Escolta program can provide. In many of the trials the evidence of Escolta treatments was obvious, with reduced disease presence and increased crop greening (see photos). As an average across the trials, the Escolta treatments resulted in a 15% yield increase which equated to an extra 3 tonnes of dry matter (see graph below).

AVERAGE 18 TRIALS



For more information go to hardtobeet.co.nz

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VISUAL DISEASE CONTROL & GREENING EFFECT

Untreated control



Escolta x 1

Escolta x 2



VISUAL DISEASE CONTROL & GREENING EFFECT

ESCOLTA DEMOS - CULVERDEN (Assessment: May 2017)



For more information go to hardtobeet.co.nz

CULVERDEN, NORTH CANTERBURY

Escolta x1 24 T/ha Untreated 21.8T/ha

Escolta x2 26.1 T/ha

GETTING THE BEST FROM ESCOLTA



- Timing is critical
- Following covering in, the crop should be regularly monitored for first signs of disease
- Do not apply Escolta before the crop covers in
- Once the crop covers in, the crop canopy can provide ideal conditions for disease (humidity and moisture)
- Once the first signs of disease are present, or if weather conditions favour disease development, make the first application of Escolta immediately
- Like most fungicides, Escolta works best if used preventively
- Do not allow disease to become established before applying Escolta. If disease is already

established, poor or reduced effectiveness may result from Escolta applications

- Make a second application 3-4 weeks later. Ensure a minimum of 21 days between applications
- Escolta can be applied by ground or aerial application. See the label for more information
- Trials have demonstrated 2 applications provide superior results

KEY POINTS FOR USE



CROPS	Fodder and sugar beet.		
DISEASES CONTROLLED	Rust, powdery mildew, Cercospora and Ramularia leaf spot.		
RATE	350 mL/ha.		
NUMBER OF APPLICATIONS	Maximum of 2 applications per season.		
SPRAY TIMING	Make the first application when disease is first seen in the crop, and before disease becomes established. Make a second application 3-4 weeks later. Ensure a minimum of 21 days between applications.		

Ground application

WATER RATE

– use 200 litres of water per ha.

Aerial application

– use 80 L/ha.

WITHHOLDING PERIOD

42 days.

PACK SIZE

5 litre plastic bottle. Agrecovery compatible.

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For more information go to hardtobeet.co.nz

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Technical update: In 2018/19, under certain conditions, Cercospora resistance to Qol fungicides was found in beet crops in a small number of NZ locations. So, Escolta may not always provide control of Cercospora but will continue to control other important diseases, leading to profitable yield increases. For more information, go to cropscience.bayer.co.nz/escolta.