Major **Pests** and **Diseases** of **Climbing Beans**

NARO

IITA
Transforming African Agriculture

N2N

Illustrated and designed by:
MANGO TREE
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Acknowledgements

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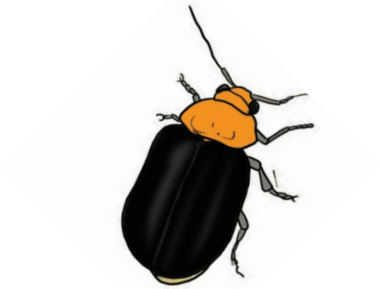
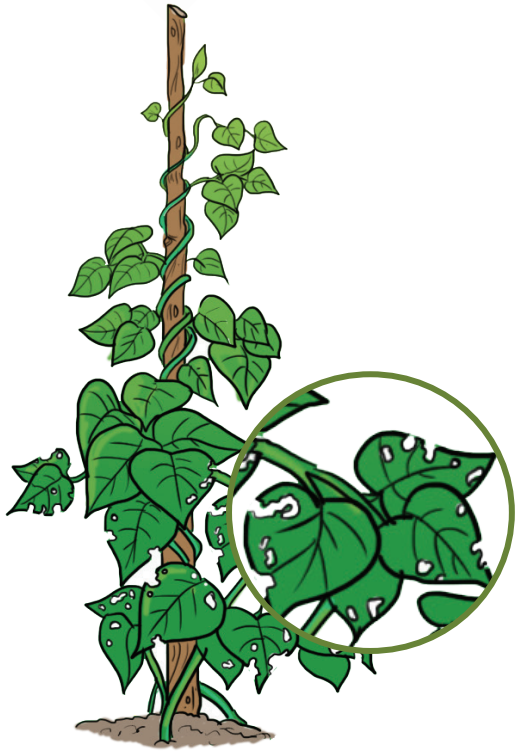
Bean leaf beetle





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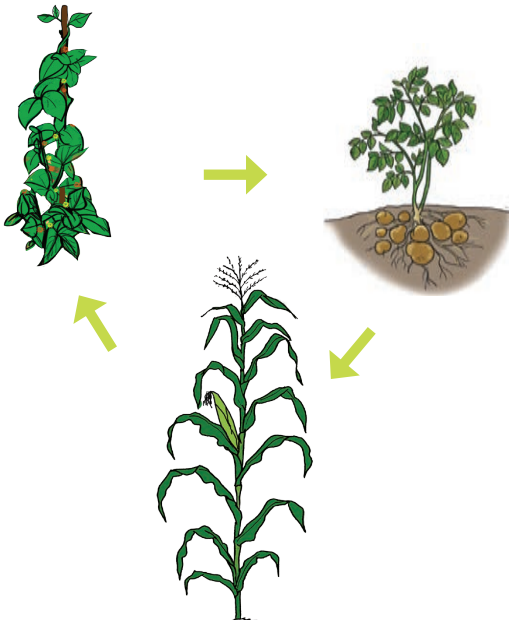

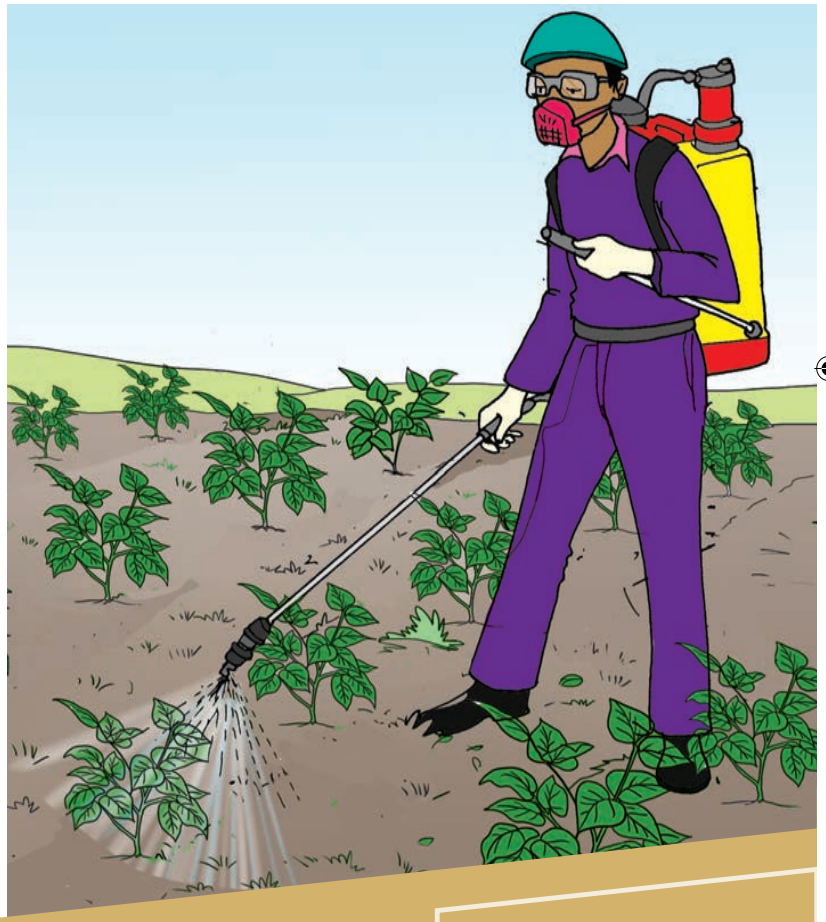

Pests

- Bean leaf beetles damage bean crops the most during the vegetative growth stage.
- They feed on leaves, indicated by round holes. In extreme cases, only the veins of a leaf will remain and plants can die.
- Cultural controls of bean leaf beetles:
  - Plant crops at the onset of rains and seasons when pest populations are low.
  - Rotate crops to break infestation cycles of the beetles.
  - Post harvest tillage to expose infant soil borne stages (i.e. larvae and pupae).
- Chemical control of bean leaf beetles:
  - Spray using contact insecticides such as cypermethrin or Rocket 2 weeks after planting. These are applied at a rate of 30 mls per 20 litres using a knapsack sprayer; 6 knapsack sprayers will complete application over 1 acre.

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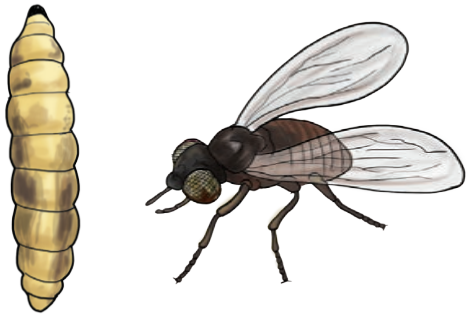
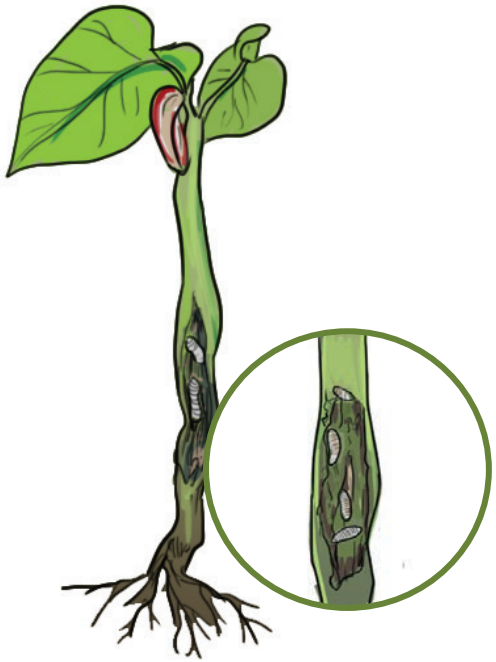
Bean stem maggots





Control

Pests

- Bean stem maggots are the larvae of bean flies. These larvae affect bean crops by feeding primarily on the base of affected plants, disrupting nutrient transportation and causing the tap root to die. In severe cases, the root collar around a plant becomes swollen or cracked, enabling root rot diseases to easily attack. Severely damaged seedlings will wilt and die.
- Cultural controls of bean stem maggots / bean flies:
  - Plant early, such as at the onset of rains, when insect populations are low.
  - Pile soil around stems. This can be done at the time of the first weeding.
  - Ensure good soil fertility to maintain healthy growth of plants.
- Chemical controls of bean stem maggots / bean flies:
  - Dress seed with insecticide before planting.
  - Apply foliar sprays once plants have become established. Insecticides containing chlorpyrifos and/or cypermethrin (such as Rocket, Haopyrifos, etc.) are common foliar sprays that can be applied following manufacturer recommendations.

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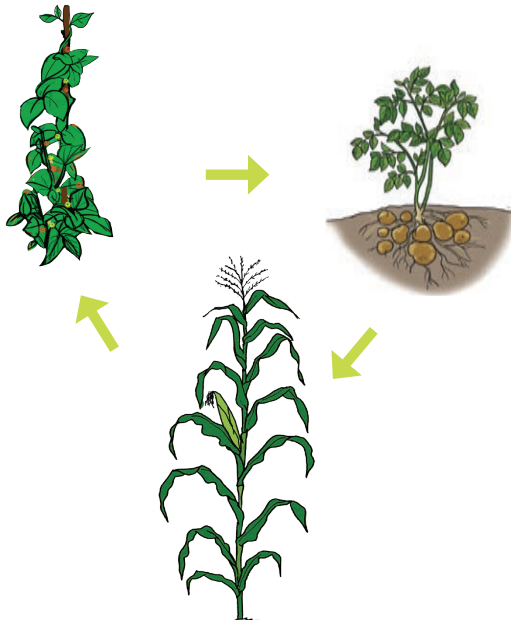
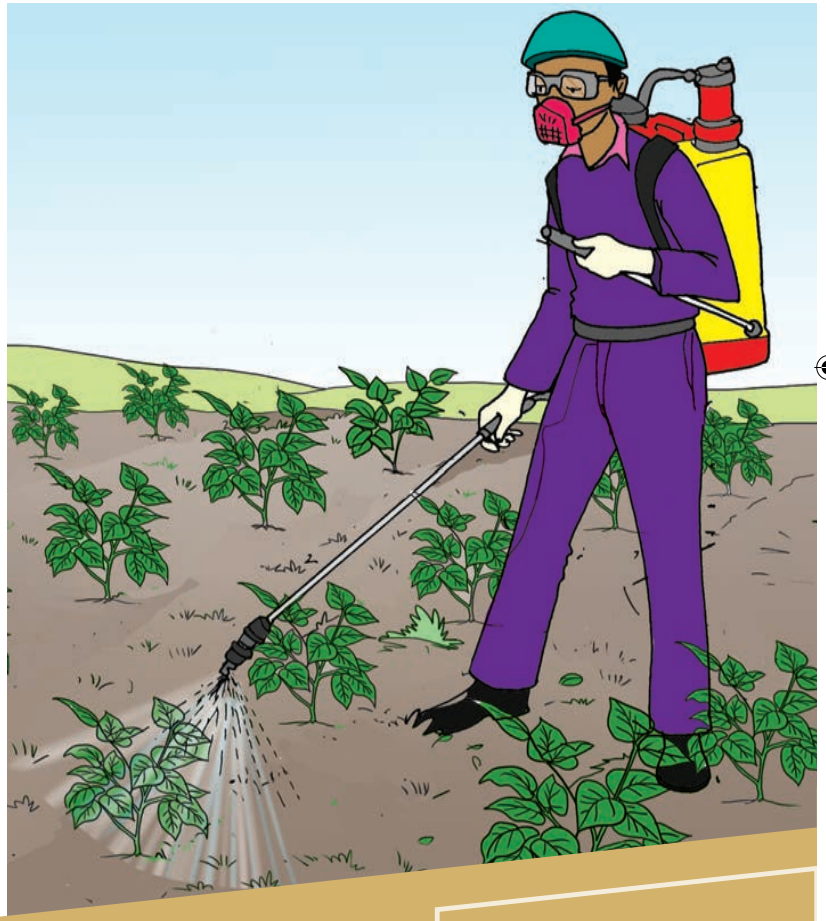
Black bean aphids

Control

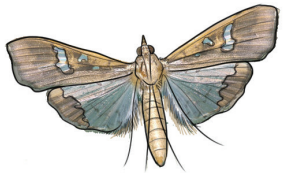


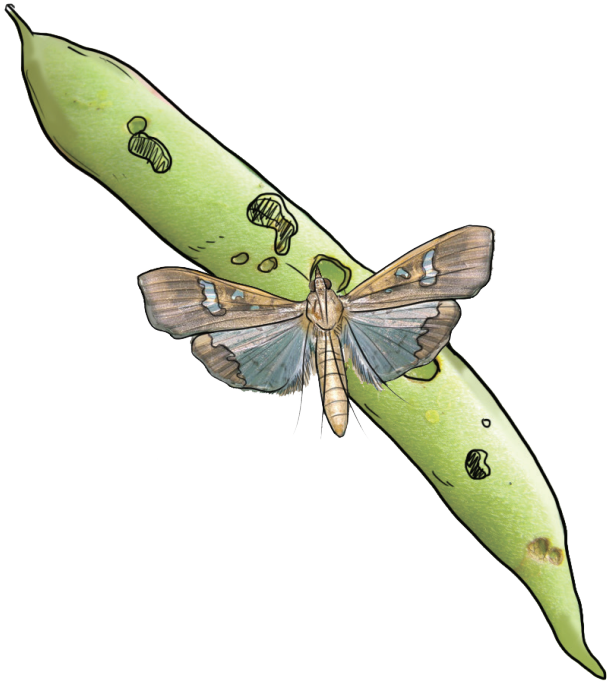


Pests

- Black bean aphids are the main aphid pest that affects beans. They are tiny and damage crops in a number of ways. They feed on bean plants by sucking the sap from stems and veins of foliage. When bean aphids feed on one plant then move to another, viral diseases are able to spread between plants easily. Their role in transmitting bean common mosaic virus can be more economically damaging than the direct damage they do when feeding on plants.
- Soft foliage such as tender growing points or young foliage is preferred by bean aphids. Affected plants can be identified when leaves begin to curl or change colour in response to aphids feeding on them. Colonies are made around stems, growing points and leaves. They are often found feeding on the underside of leaves, although they may sometimes cover a whole plant.
- Because they multiply quickly and can spread viral diseases (e.g. bean common mosaic virus), timely response to aphids is critical to maintain healthy bean crops.
- Cultural controls of bean aphids:
  - Rotate bean crops with non-host crops
- Chemical control of bean aphids:
  - Apply insecticides such as dimethoate following manufacturer recommendations

Bean pod borers





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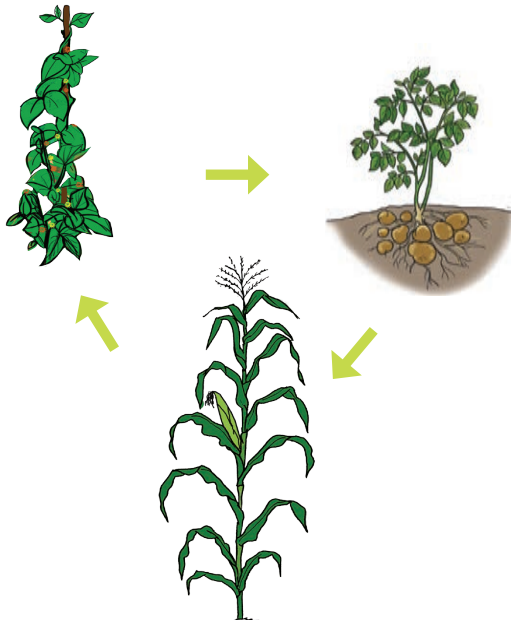

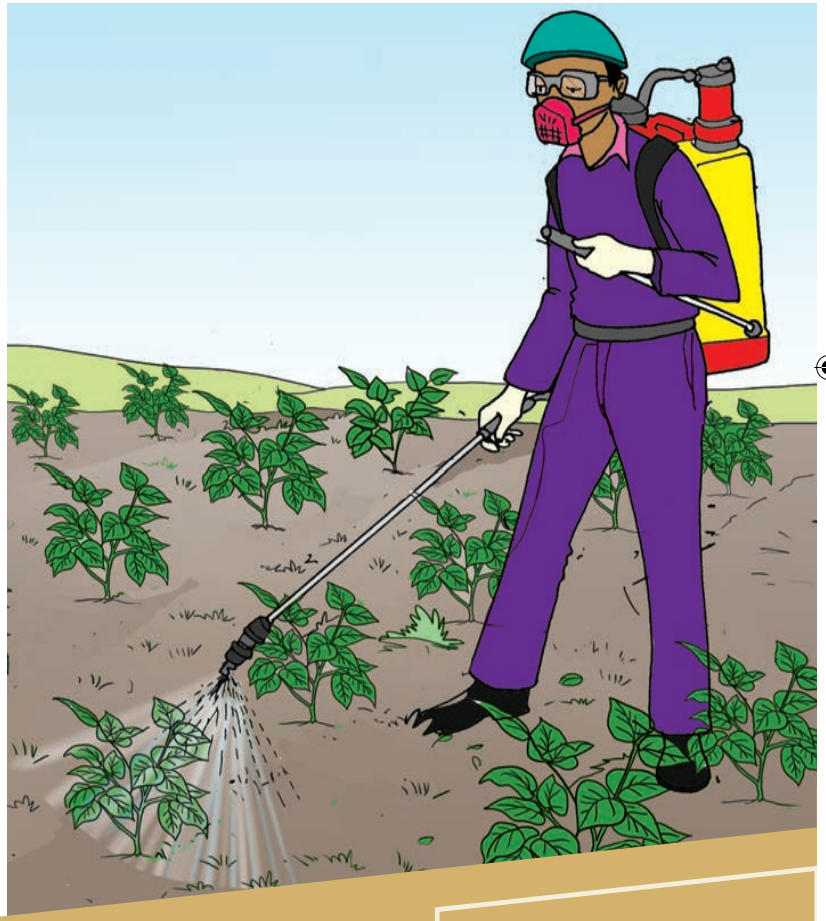

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- Bean pod borers are a larval stage of moth that damage bean plants. The larvae feed from inside flower buds, flowers and pods. They often plug entry holes with frass (fecal matter) to protect themselves. Once they bore into the bean pods, they eat the seeds within.
- Affected plants will show signs that the flowers have been eaten by the caterpillars.
- It is advisable to scout for these pests regularly so that control can be initiated during the early stages of infestation.
- Cultural controls of pod borers:
  - Do not plant new crops near gardens that are known to be contaminated.
  - Rotate bean crops with non-host crops, such as cereal crops like maize or tuberous crops like irish potatoes.
  - Identify infected crops then remove and destroy plant debris after harvesting.
- Chemical control of pod borers is difficult because the pod borer larvae are well protected when they live within flower buds, pods or webs.
  - If chemical treatment is chosen, avoid spraying close to harvesting times to prevent the presence of residual chemicals in pods and seeds.

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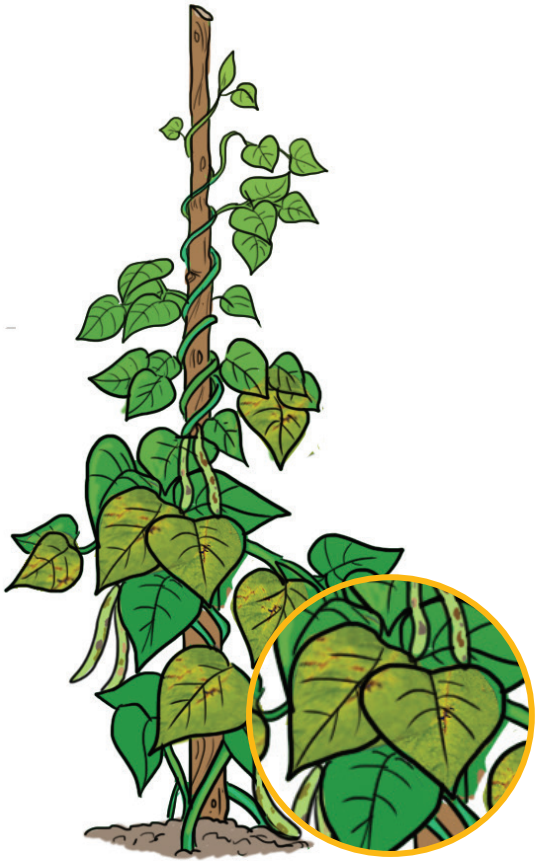
Anthracnose



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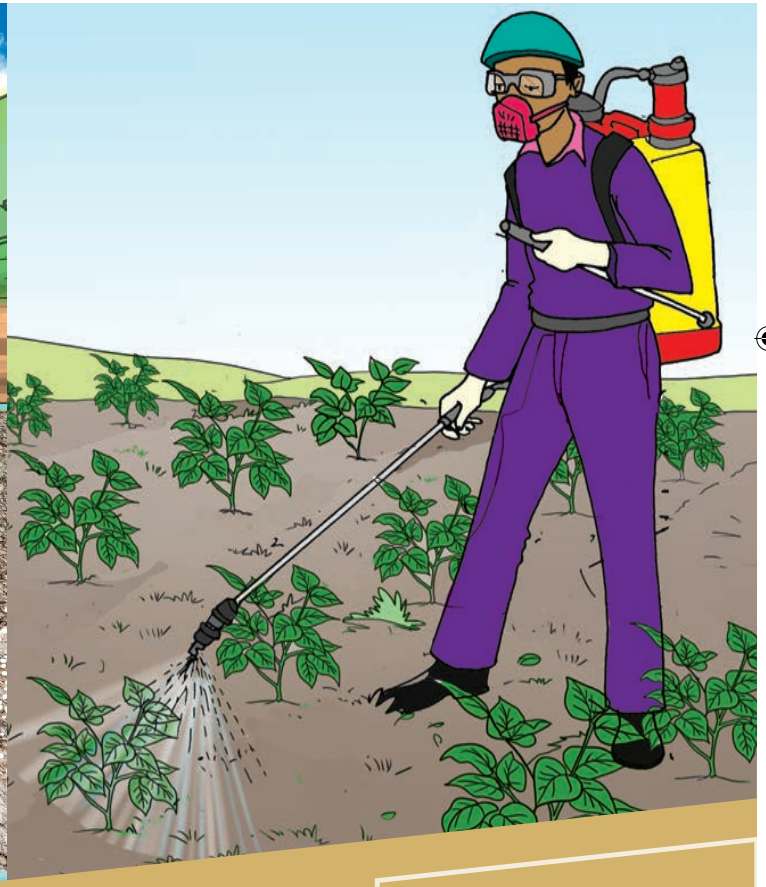

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- Anthracnose is a seed borne disease which attacks all above ground parts of the bean plant. Depending on the time of infestation, it can cause yield losses of up to 100%.
- The disease can be identified by dark red to black colouring of veins, especially on the underside of leaves. The most apparent symptom is the development of lesions on bean pods. These lesions are encircled by a black ring that is surrounded by a reddish border. The pods of severely infected plants will shrivel and dry prematurely.
- Cultural controls of Anthracnose:
  - Plant clean and disease free seeds of tolerant or resistant varieties.
  - A 2-3 year crop rotation with cereals to reduce the presence of diseased material in the soil.
- Chemical controls of Anthracnose:
  - Dress seed with thiram or ziram to help control infection in the seed coating.
  - Fungicides such as benomyl and mancozeb can be applied to plants following manufacturer's recommendations.
  - Apply organic or inorganic amendments to improve soil fertility.

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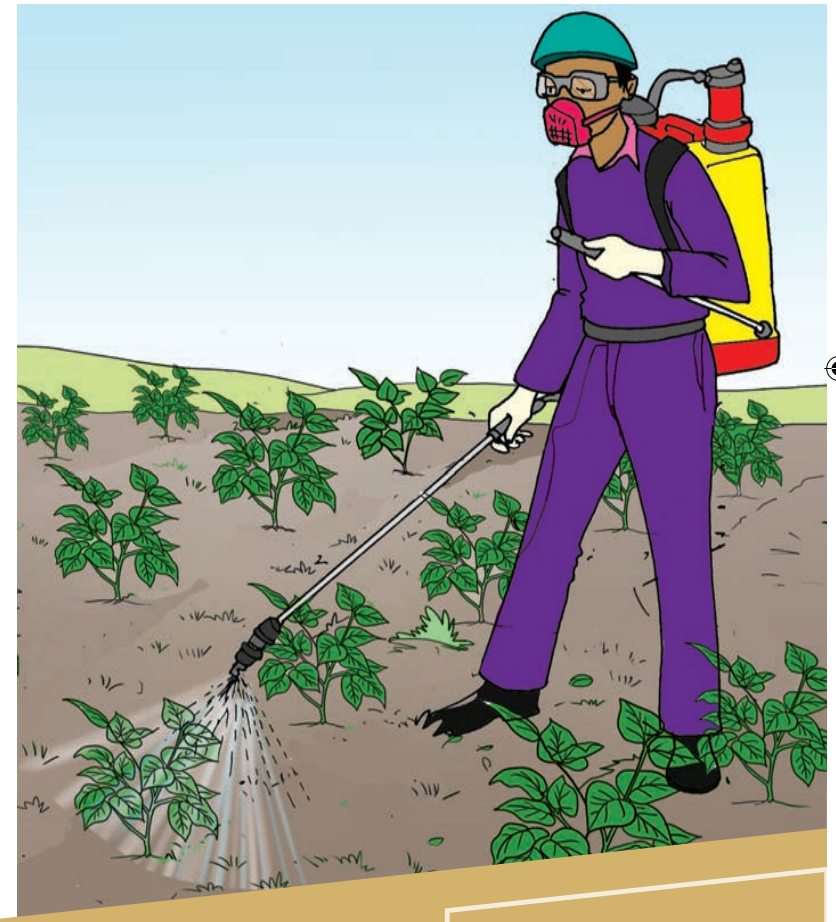
Angular leaf spot

Control



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- Angular leaf spot is a foliar and seed borne disease that typically causes yield losses of 10 - 50%.
- The disease is identified by grey coloured lesions that blacken with time; leaves of infected plants can fall from the plant prematurely when damaged by excessive lesions. Symptoms usually develop during the late flowering and early pod filling stages.
- Cultural controls of angular leaf spot:
  - Plant clean and disease free seeds of tolerant or resistant varieties.
  - Rotate crops to reduce diseased material in soil.
  - Bury infected plant debris deep in the soil during land preparation.
- Chemical controls of angular leaf spot:
  - Fungicides such as benomyl or fungicides containing mancozeb or metalaxyl can be applied to plants at early stages of infection following manufacturer's recommendations.
  - Apply organic or inorganic amendments to improve soil fertility.

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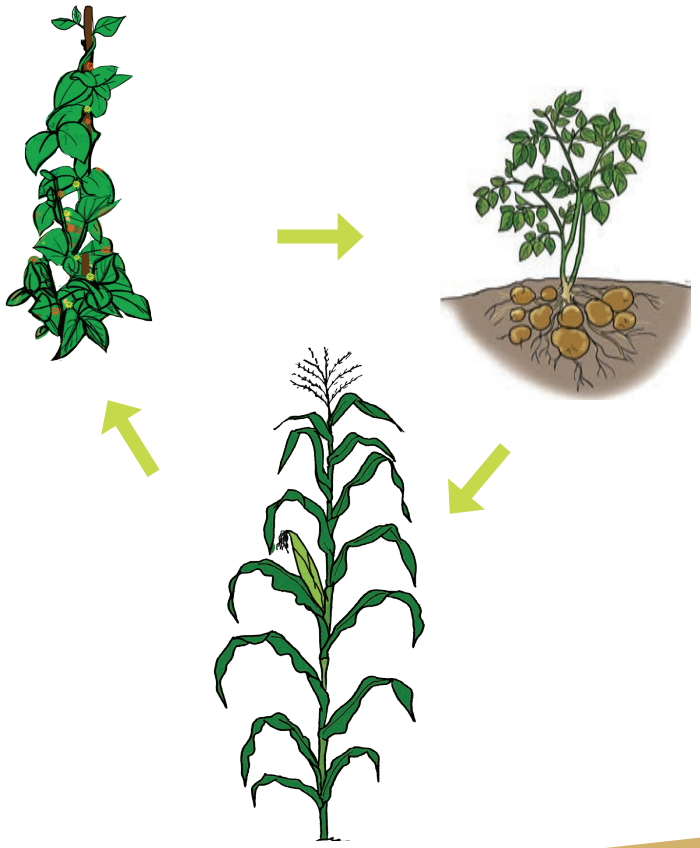
Common bacterial blight (CBB)

Control



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- CBB is a foliar and seed borne disease that typically causes yield losses of up to 60%.
- The disease is identified in seeds by discolouration. On plants, leaves have irregular shaped water soaked spots. Lesions have distinct yellow margins. Pods of infected plants become affected with yellow to reddish brown legions.
- Cultural controls of CBB:
  - Plant clean (disease free) seed of tolerant or resistant varieties.
  - Rotate crops to reduce diseased material in soil.
  - Bury infected plant debris deep in the soil during land preparation.
  - Avoid moving through or working in an infected field during wet periods to avoid transmitting the disease to healthy plants.
- Chemical controls of angular leaf spot:
  - Seeds can be treated with antibiotics such as streptomycin before planting.
  - Fields with infected plants may be sprayed with copper-based bactericides.
  - Apply organic or inorganic amendments to improve soil fertility.

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Bean common mosaic virus / Bean common mosaic necrotic virus

Control

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- Bean mosaic virus is seed borne disease.
- Leaves of infected plants have dark green patches on a lighter green background. Leaves, flowers and pods can show curling and growth is stunted in severely infected plants.
- Cultural controls of bean mosaic virus:
  - Plant clean (disease free) seed of tolerant or resistant varieties.
  - Plant beans in isolated fields (i.e. away from other bean fields).
  - Plant early to reduce or avoid aphid infection.
  - Destroy bean aphids and other insect vectors. (May require the use of chemicals)
  - Bury infected plant debris deep in the soil during land preparation.
  - Rotate crops to reduce diseased material in soil.
- Chemicals cannot be used to directly control bean mosaic virus, so it is important to remove and destroy infected plants to reduce the spread of disease.

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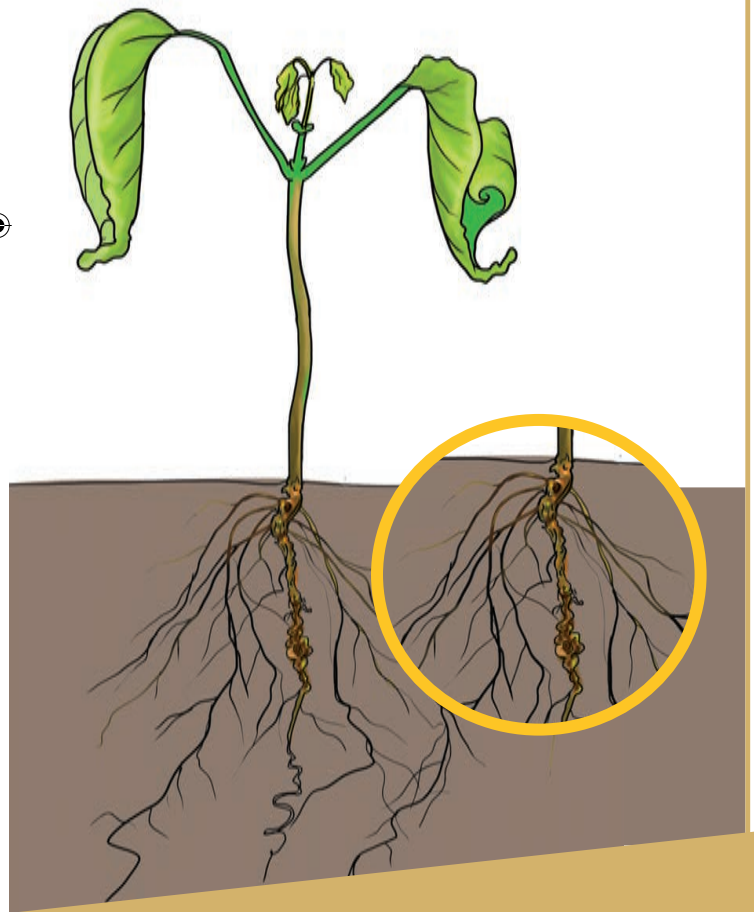
Root rot diseases



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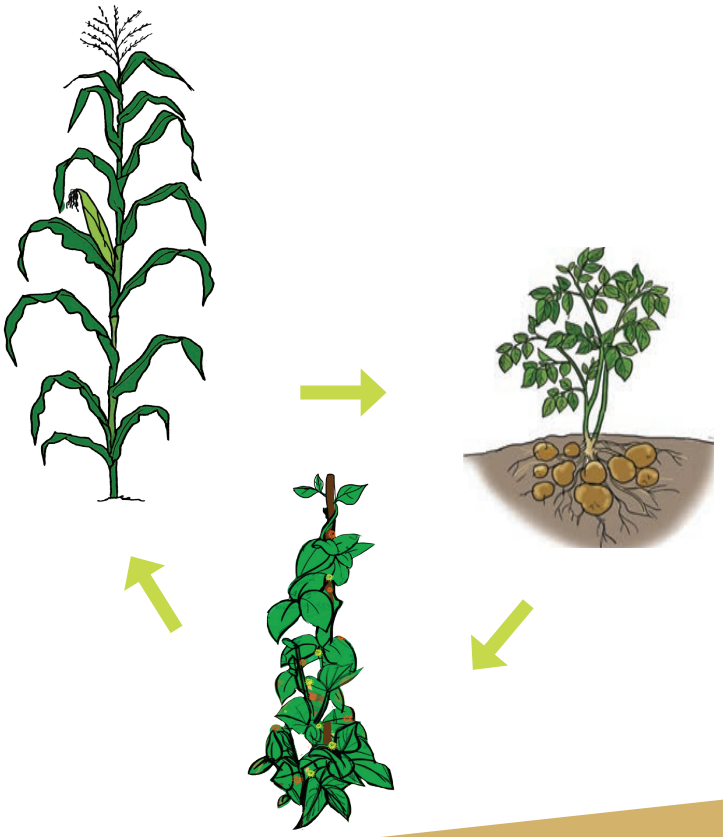

Diseases

- Common pathogens of root rot include sclerotium (southern blight), fusarium and pythium.
- Various root rot diseases have different specific symptoms, but all affect root structure and appearance. Roots may become discoloured, collapsed, deformed or may die.
- Cultural controls of root rot:
  - Plant clean (disease free) seed of tolerant or resistant varieties.
  - Rotate crops to improve soil health and fertility.
  - Plant in well-drained soils and on furrows.
  - Maintain proper crop spacing to promote healthy plant growth.

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