NSW GOVERNMENT

Department of Primary Industries

PLANT HEALTH AND BIOSECURITY


WE NEED PLANTS!
Plants are important. They provide food, fibre and shelter and produce the oxygen we breathe.
Biosecurity Warrior

Plant biosecurity helps us all

Exotic pests and diseases can be a major problem to our ecosystem and agriculture. Native plants and the fruit and veggies we love are at risk!

The Australian government works to keep these threats out by practicing good biosecurity. Biosecurity helps protect us from exotic threats, as well as threats from other states and regions, and even between farms.

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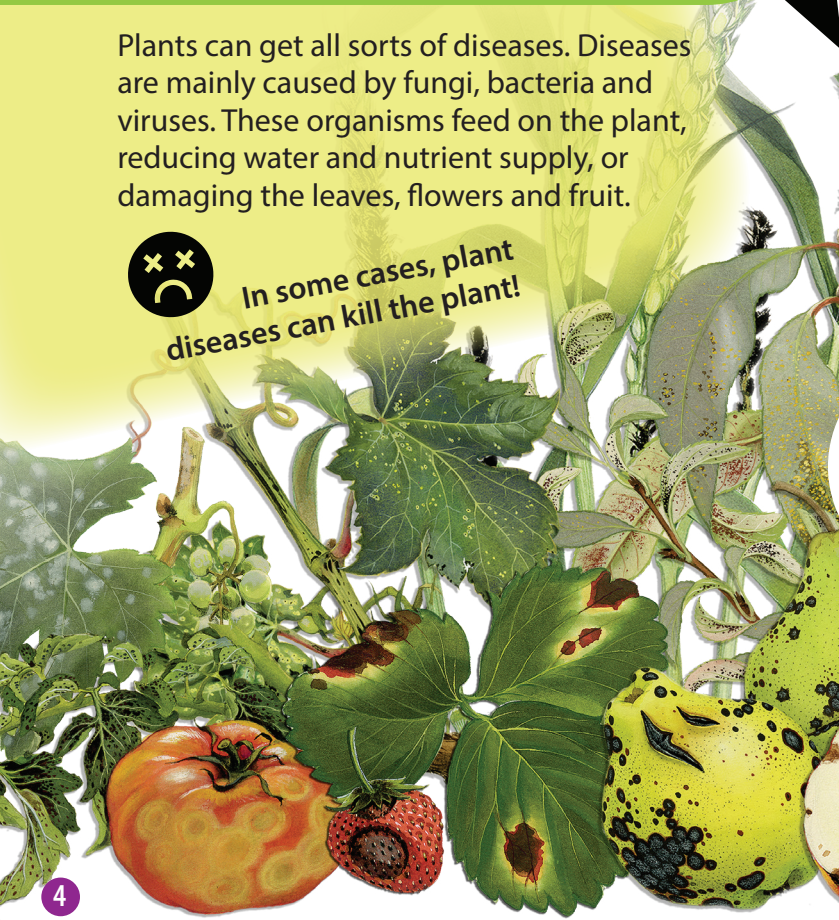
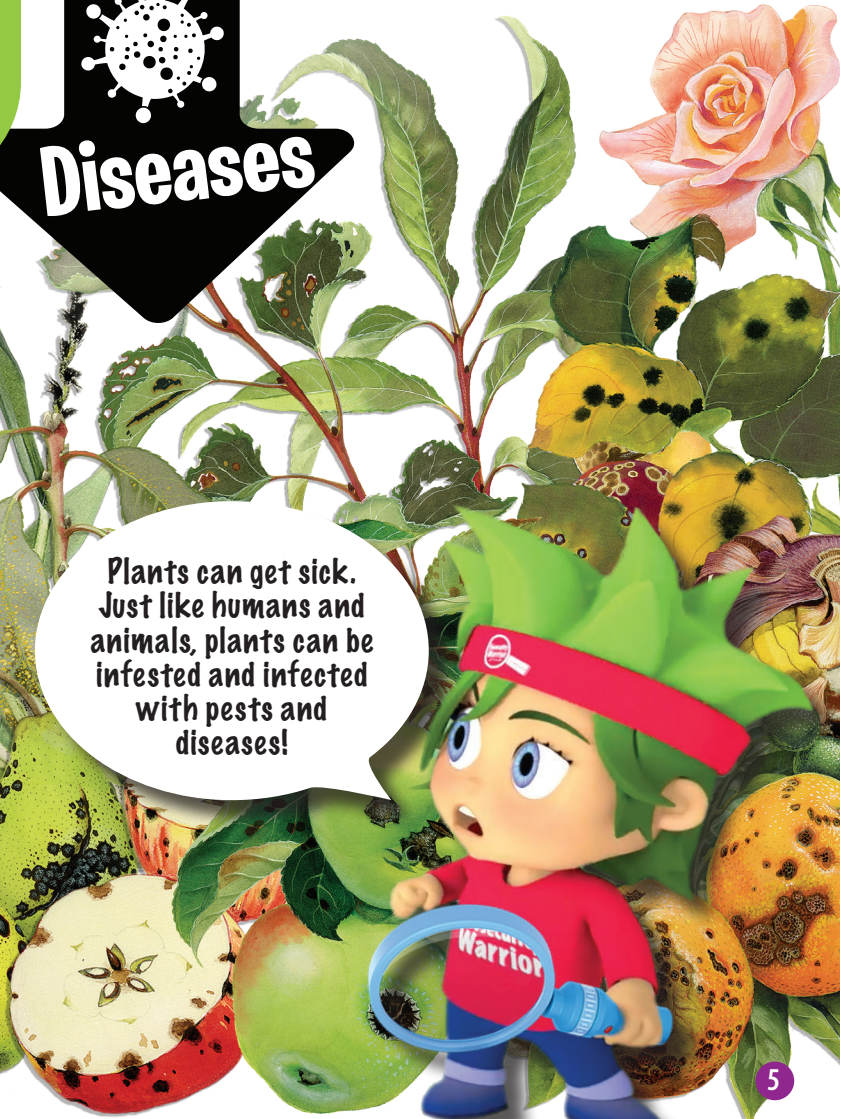
Plant health is important

Plants can get all sorts of diseases. Diseases are mainly caused by fungi, bacteria and viruses. These organisms feed on the plant, reducing water and nutrient supply, or damaging the leaves, flowers and fruit.

In some cases, plant diseases can kill the plant!

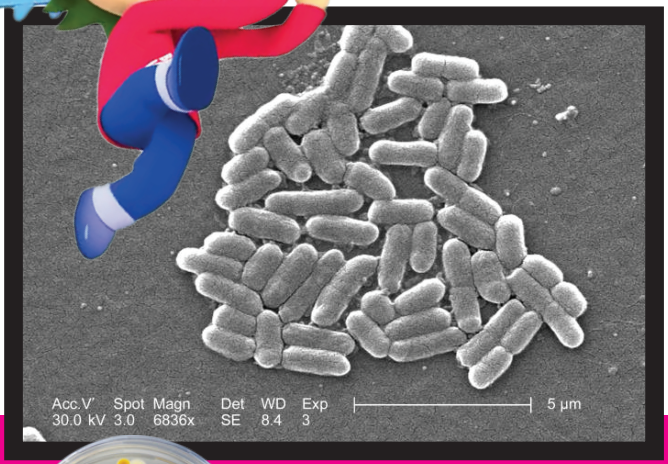


Diseases

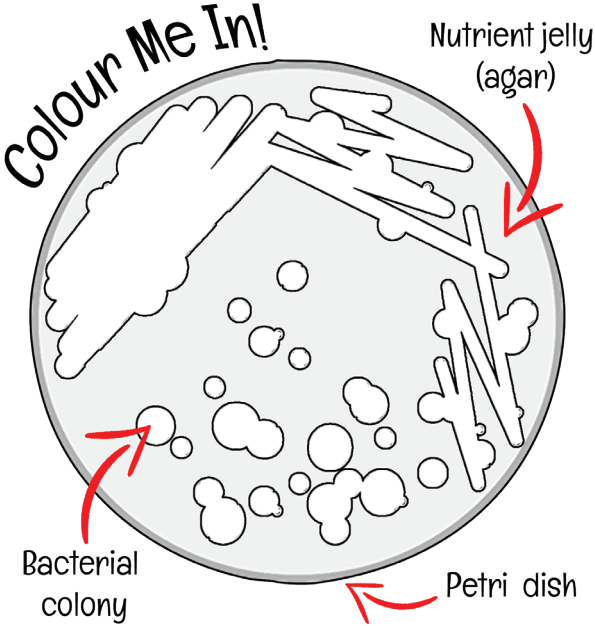

Plants can get sick. Just like humans and animals, plants can be infested and infected with pests and diseases!

Bacteria

Bacteria are very small but when there are billions of them they clump together to form a 'colony'. These colonies can clog up the vessels in plants that transport water and nutrients, killing the plant.



A micron (µm) is very tiny - there are 1000 microns in a millimetre and a million in a metre



Bacteria may cause disease and be slimy and stinky but they come in some amazing colours, like pink, yellow and orange! Scientists study bacteria by growing them on jelly in special containers called petri dishes.

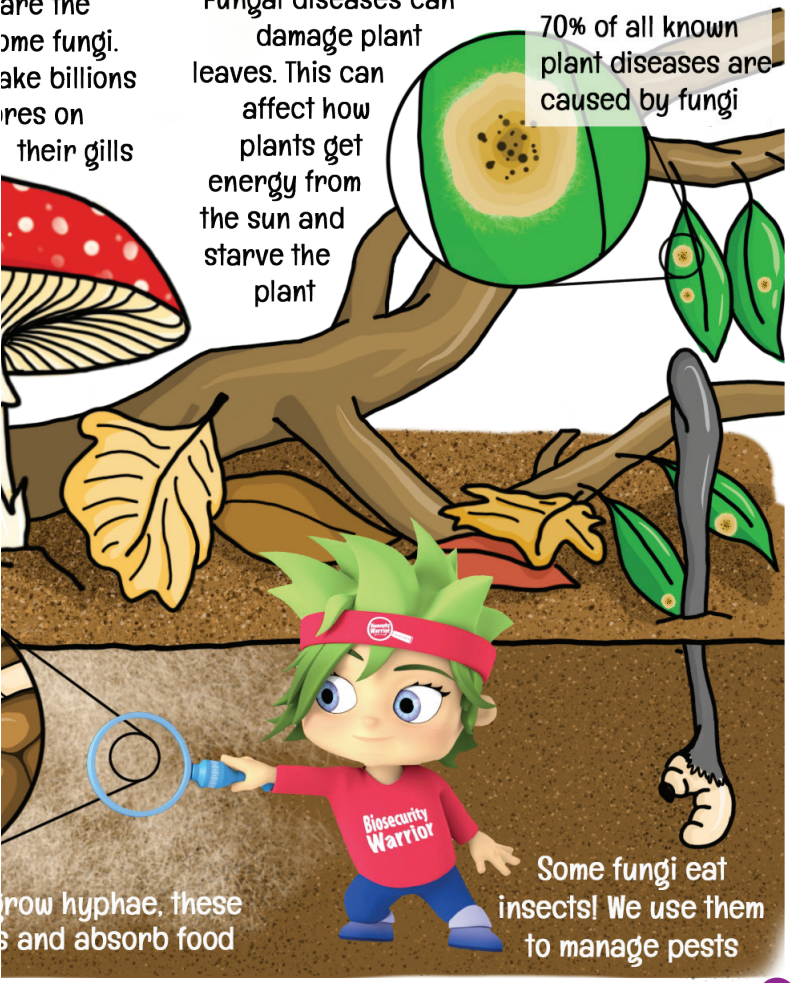
Fungi

Moulds, yeasts and mushrooms are fungi but there are also disease causing fungi - fungal pathogens. These infect plants, damaging and rotting them as they produce their spores. Spores are like tiny seeds. They travel long distances and can be spread by water, wind, insects and animals, including humans.

are the
ome fungi.
ake billions
res on
their gills

Fungal diseases can damage plant leaves. This can affect how plants get energy from the sun and starve the plant

70% of all known plant diseases are caused by fungi



row hyphae, these
s and absorb food

Some fungi eat insects! We use them to manage pests

Viruses

Viruses are 100 times smaller than bacteria and can only be seen with a powerful microscope.

Viruses cause crazy symptoms in the plant host and we name the disease after these, like Tulip breaking virus.

There is no cure for a virus, infected plants are destroyed.

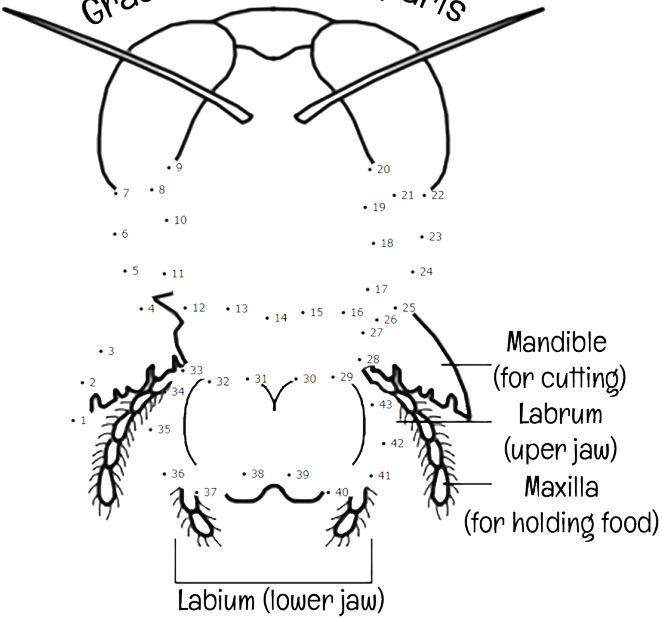
Insect Pests

Insects cause damage to plants by eating and wounding them, insects can cause damage in different ways. Insects cause billions of dollars worth of damage to our crops every year.

Chomping and chewing

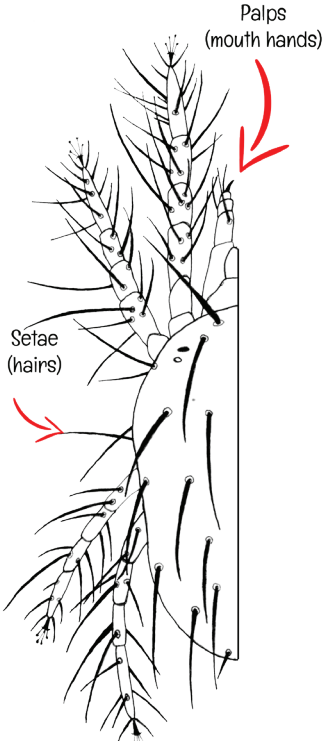
These insects have mouthparts that allow them to chew up plants. This is a big problem when there's lots of them. Some insect lay their eggs inside plants and the larvae eat the plant from the inside.

Grasshopper Mouthparts



Tiny but mitey

Mites can have a huge impact on production and plant health. They not only eat the plant but also impair their leaves, rolling them up for shelter.



Draw the other half of the "spider" mite!

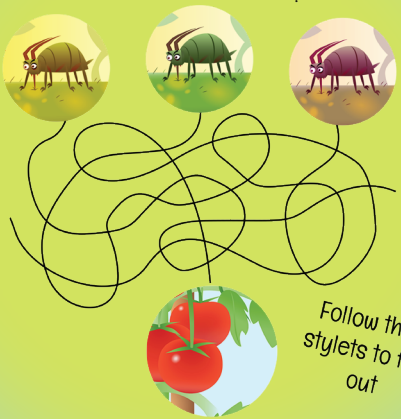
The study of mites is called acarology.

Mites have 8 legs. They are arachnids, like spiders.

Sap-sucking insects

Sucking insects have a special mouthpart called a stylet. This acts like a straw, sucking out the water and sugar from inside the plant. These are the worst disease vectors as their mouthparts can pierce through the plant's epidermis (skin) and let bacteria and viruses inside!

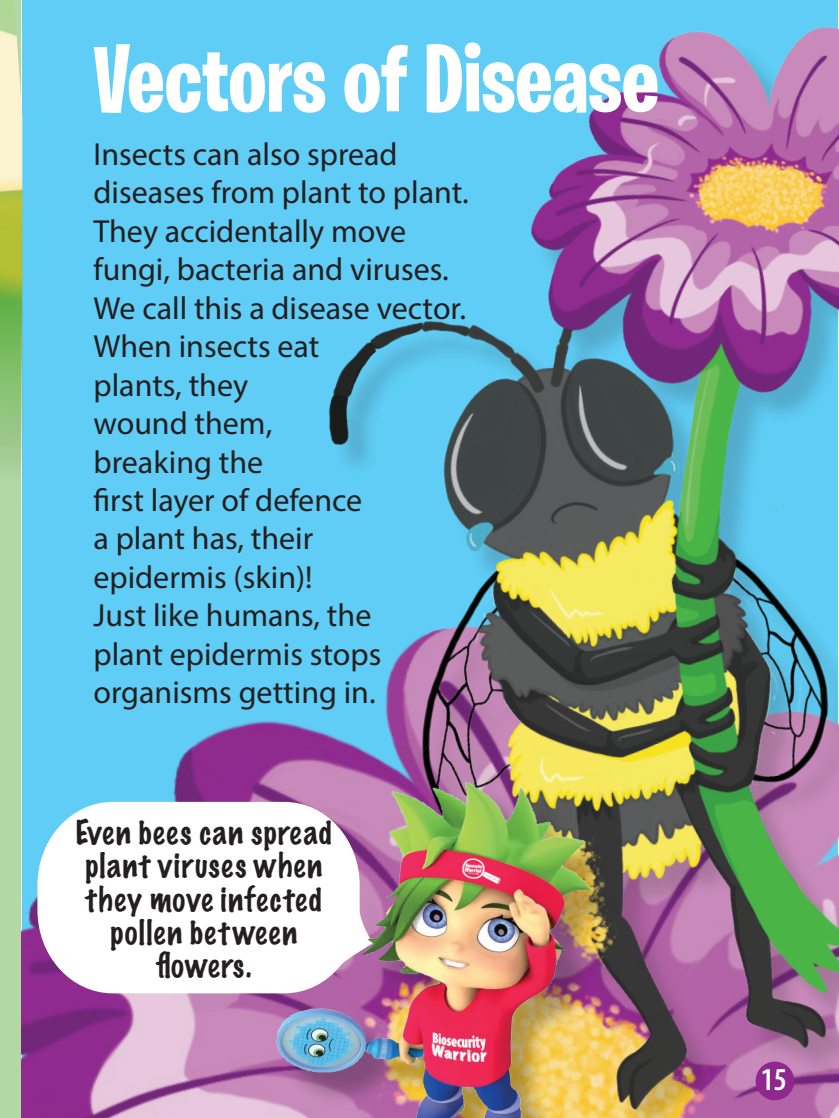
Which one of these insects is feeding on the plant?



Follow their stylets to find out

Vectors of Disease

Insects can also spread diseases from plant to plant. They accidentally move fungi, bacteria and viruses. We call this a disease vector. When insects eat plants, they wound them, breaking the first layer of defence a plant has, their epidermis (skin)! Just like humans, the plant epidermis stops organisms getting in.



Exotic threats

Australia must cope with lots of plant pests and diseases already. Some have always been here (native) and some have been introduced.

There are still hundreds of pests and diseases that aren't here! These are a threat to our environment and agriculture, we call these EXOTIC

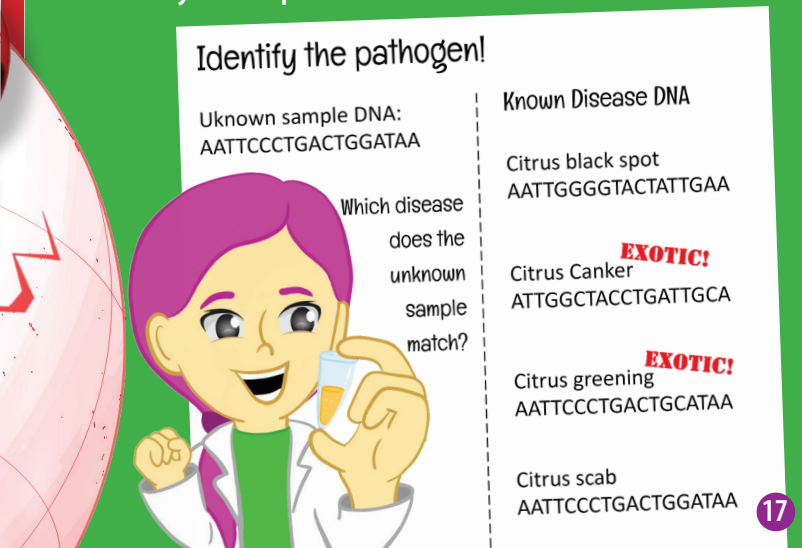
Our Biosecurity Network is made up of four main actions:

- PREPARE
- PREVENT
- RESPOND
- RECOVER

PREPARE

Scientists develop rapid identification tools to diagnose pests and diseases as fast as possible.

DNA plays a big role in early detection. DNA is unique in each organism, so we can use it to help us identify exotic pests and diseases.



PREVENT

Monitoring the movement of plants and products helps prevent the spread of pests and diseases. That's why we inspect shipping containers, packages and luggage to look for signs of hitchhikers.

You can help!

Make sure your luggage is free of insects, plant parts and soil.

Answers: insects, fruit, soil, plants, seeds

RESPOND

Help the biosecurity officer contain this thug of a slug !

Solve the maze

In the event of an exotic detection we will perform surveillance to look for the threat and assess its spread and potential impact. We will try to contain it or eradicate (kill) it.

RECOVER

Recovery from an exotic pest or disease is an important step. We continue to monitor and provide those affected with support. We write rules to improve our system and we work with growers to plant stronger plant varieties that can defend themselves.

Unscramble the words to reveal the hidden message

(the message is scrambled too)

PANTOEHG

ROVCET

PYEHAH

OCNOYL

ESPREIMDI

ETSLYT

TNAEIV

TCXEOI

CRITOYIUSBE

DICETRAAE

NHLIEOT

LRSWEOF

Answers: Pathogen, vector, hyphae, colony, epidermis, stylet, native, exotic, biosecurity, eradicate, hotline, flowers
Message: You're a Warrior

An important part of Biosecuriy is... YOU!

We rely on citizen scientists to report suspect exotic threats.

ONLINE - www.dpi.nsw.gov.au/warrior

EMAIL - biosecurity@dpi.nsw.gov.au

PHONE -Exotic Plant Pest Hotline: 1800 084 881

Draw yourself and write your name on your Biosecurity Officer ID card

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JUNIOR **Authorised Officer**
Biosecurity Certifier
Biosecurity Act 2015

We've created a top 40!

We're not talking about music charts, we're talking about exotic pests and diseases! These are the pests and diseases with the greatest potential to enter Australia and have a big impact on agriculture and the environment.

Learn all about them online at:

www.agriculture.gov.au/pests-diseases-weeds/plant

You can scan the QR code above with your camera on a smart phone to go straight to the website!

More ways to HELP

- ☒ Don't enter properties without permission.
- ☒ Don't move plant parts or soil.
- ☒ Don't share gardening tools or equipment between gardens.
- ☒ Don't plant supermarket bought vegetables in your garden to re-grow.
- ☑ Buy locally sourced and certified seeds and plants.
- ☑ Report any pests you find in the mail.
- ☑ Make sure all plant scraps are composted before spreading in the garden.

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To learn more about biosecurity in NSW visit:
www.dpi.nsw.gov.au/biosecurity

Special thanks to the following sponsors

PLANT BIOSECURITY science foundation

APPS Australasian Plant Pathology Society

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