NSW Department of Primary Industries
SCHOOLS PROGRAM

Biosecurity monitoring and surveillance with the NSW Department of Primary Industries

Teacher's Guide

In this video – synopsis

6 mins 27 secs

In this video we tag along with NSW Department of Primary Industries biosecurity team for a surveillance visit to site in the Sydney region to look for evidence of the presence of invasive pests and plants diseases. It covers why we have a monitoring and surveillance program, which sites we visit and what we are looking for. The video also talks about the potential impacts of invasive pests and diseases on agriculture and Australian primary industries.

Careers highlighted: entomologist, plant pathologist, biosecurity officer.

Steps to a surveillance and monitoring program are included as well as what to do if you find something of concern.

We recommend that teachers watch these videos before showing them to students to assess their suitability. There are some scientific terms used in the videos that your students may not be familiar with. We have provided some definitions in this document for teachers who would like to use the videos as an opportunity to develop the scientific literacy of their students.

Other videos in this series include:

- The Scientific Collection at the Orange Agricultural Institute
- Let's talk about aphids
- Preserving the Scientific Collection of the NSW Department of Primary Industries

curriculum links

This video can support students understanding of the following outcomes:

Stage 3

Science and Technology

A student:

ST3-10LW - describes how structural features and other adaptations of living things help them to survive in their environment

ST3-11LW - describes some physical conditions of the environment and how these affect the growth and survival of living things

Stage 4

Science and Technology

A student:

SC4-14LW relates the structure and function of living things to their classification, survival and reproduction

SC4-15LW explains how new biological evidence changes people's understanding of the world

Geography

A student:

GE4-5 discusses management of places and environments for their sustainability

GE4-3 explains how interactions and connections between people, places and environments result in change

Agricultural Technology

A student:

4.1.2 outlines the interactions within and between agricultural enterprises and systems

4.3.3 identifies and uses skills to manage the interactions within plant production enterprises

Stage 5

Geography

A student:

GE5-3 analyses the effect of interactions and connections between people, places and environments

GE5-5 assesses management strategies for places and environments for their sustainability

Agricultural Technology

A student:

5.1.2 explains the interactions within and between agricultural enterprises and systems

5.3.3 explains and evaluates the impact of management decisions on plant production enterprises

Vocabulary used:

Unless otherwise stated definitions are from the Free Online Dictionary (http://www.thefreedictionary.com/)

Note: Where (Biology) appears in brackets before a definition, this indicates that there are other definitions (usually in different disciplines) but that this definition relates to the way the term is used in this video.

Biosecurity	The set of measures taken to limit or counter the threat posed by sudden widespread disease or biological contamination, as from biological warfare, acts of bioterrorism, or pandemic outbreaks, including measures for increasing public safety and preparedness as well as procedures aimed at restricting access to biohazardous materials or to information relating to their production.
Collaborate	When people collaborate on a project, they work together in order to produce something. For example, two writers can collaborate to produce a single piece of writing.
Curate	1. To organise and oversee (an art exhibit or film festival for example). 2. To gather and present to the public
Disease	1. (Pathology) any impairment of normal physiological function affecting all or part of an organism, especially a specific pathological change caused by infection, stress, etc, producing characteristic symptoms; illness or sickness in general 2. (Plant Pathology) a corresponding condition in plants
Domestic	Produced in or indigenous to a particular country
Invasive	(Biology) Tending to spread widely in a habitat or ecosystem. Used especially of non-native species
Lure	A decoy used in catching animals
Monitoring & surveillance	Monitoring and surveillance involves looking for and recording the presence, absence and population levels of pests. Regular monitoring is a fundamental part of management practice and gives the best chance of spotting a new or established pest soon after it arrives (Farm Biosecurity Program - www.farmbiosecurity.com.au)
Morphological	The form and structure of an organism or one of its parts
Native	Originating, growing, or produced in a certain place or region; indigenous
NSW DPI	New South Wales Department of Primary Industries
Pathologist	Specialist in the structural and functional changes caused by disease

Quarantine A condition, period of time, or place in which a person, animal, plant, vehicle, or amount of material suspected of carrying an infectious agent is kept in confinement or isolated in an effort to prevent disease from spreading.

Residential Characterised by private residences

Surveillance (and monitoring) Monitoring and surveillance involves looking for and recording the presence, absence and population levels of pests. Regular monitoring is a fundamental part of management practice and gives the best chance of spotting a new or established pest soon after it arrives (Farm Biosecurity Program - www.farmbiosecurity.com.au)

Verdict An expressed conclusion; a judgment or opinion.

Transcript of Video

Text: Biosecurity is a shared responsibility. The NSW Department of Primary Industries plays its part by undertaking regular monitoring and surveillance of sites likely to show early signs of biosecurity risks. We tagged along with one of the surveillance teams to see what's involved.

Ainsley: Hi I'm Ainsley Seago and entomologist with the Department of Primary Industries. We're here at Waverton in north Sydney because this is exactly the kind of high traffic urban area with a lot of plant life where introduced pest species are likely to be found.
Monitoring and surveillance are an essential part of biosecurity. It's how we monitor the presence, absence and population levels of pests, weeds and diseases. It's an important part of keeping New South Wales safe from introduced plant pests, animals' diseases and plant diseases as well.

We conduct surveillance by visiting high traffic areas that are particularly at risk for the introduction of new pest species or the spread of pest species throughout New South Wales. Particularly important is port areas like Port Botany and any shipping or distribution centres where a container can come directly from the airport or the sea port and then be transmitted directly out into regional NSW.

Industrial areas like this are a critical target for our biosecurity surveillance and monitoring. Sites like this are known as quarantine approved premises where goods can be imported directly inland bypassing quarantine procedures at the airport or the seaport. Industrial distribution centres like this are also located often right next to a residential neighbourhood. It could be near your school or your yard where it's easy for introduced pest species to move from the shipping pathway out into domestic plants. Regular visits and surveillance activities at sites like this are an essential part of our broader biosecurity strategy for NSW.

Identification expertise is an important part of our surveillance practice. It's important to know when you see insects and eggs like this on a plant whether or not they're a new invasive pest or a native Australian species that actually belongs here. But it's absolutely critical that we have a plant pathologist with us as well because they're the only ones who can tell whether or not spotting like this is a natural part of the plant or a sign of an important new disease.

Jordan: My name's Jordan Bailey, I'm a plant pathologist with the NSW Department of Primary Industries. I manage and curate the collection we have of plant diseases. So when we collect a disease we can take it back to id it under microscope properly and also if it is culturable we can put out on media to grow it out and get more morphological details.

Martin: My name's Martin Horwood, I'm Senior Biosecurity Officer with Greater Sydney Local Lands Service and my role is to protect plant industries in the greater Sydney area from invasive and existing pests.

When we're doing surveillance we generally look for damage to native and introduced species, we look at the foliage and look for insects or damage that's been caused by leaf feeding insects or diseases on leaves.

When we find a contaminated sample or a suspect sample - it may not be anything but we put it in a sealed container and put it in the fridge so that the leaf doesn't decay and take it back to our laboratory where we have experts and they give us the verdict as to whether it is an exotic pest or just a native pest that's been here all along.

Rachel: I'm Rachel Taylor-Hukins, I work for the Department of Primary Industries. I am the Grains Biosecurity Officer for NSW so my job is about looking for high priority pests for the grains industry.

So today we are keeping an eye out for a beetle called Khapra beetle. Khapra beetle is considered the world's worst storage pest. We're targeting distribution centres at the moment to put out traps for this beetle it may come in on trucks or shipping containers. A lot of these distribution centres have shipping containers and the Khapra beetle will survive on dry goods so not only grain but it could survive on dog food, dry spices, things like that.

So we've just entered an industrial site here and we've just found a place where they import and export dried pulses and rice and spices. So I've just popped in there and spoken to the Manager and he's very kindly offered to let us put our Khapra beetle traps out. We really do rely on the general public and businesses like this to collaborate with us, it's all part of the general biosecurity duty of NSW. So we will be back in about four weeks' time to check the trap and replace the lure.

Text: How can you help monitor threats to Australia's biosecurity?

Ainsley/Text: The steps to a monitoring and surveillance program:

1. What's your purpose? Why are you undertaking the surveillance?
2. Details of the biosecurity threat you are looking for - its name, its life cycle, its characteristics and identifiable features, habitat or hosts and images of the target.
3. Location - identify the area you are undertaking surveillance in; from broad to the narrow, what's your state, your region, your city, what's the name of your school?
4. Schedule - select a date and time to undertake surveillance based on the biosecurity threats active periods
5. Surveillance sites - select individual sites within your surveillance location like individual garden beds or plants.
6. Observations and data - outline what you are looking for at the surveillance sites for example the biosecurity threat itself or just evidence of it like feeding damage.
7. Method - how you are going to undertake the surveillance. Will you be working in small groups in individual areas or working in small groups with each group going through each area and then combining your findings? and
8. Equipment - a list the equipment you are going to need.

Text: What should you do if you find something you believe is a threat to Australia's biosecurity?

Ainsley: If you find a common pest or evidence of damage from one you can develop an action plan to continue monitoring and controlling it. If you find a pest that you don't recognise or you've never seen before you can submit it to us for diagnosis.