

Industry Insights - Weeds in NSW

Supporting document



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Weeds in NSW

1. Complete the passage using words from the NSW DPIRD Schools Program '[Weeds in NSW](#)' poster.

Weeds impact _____ and pose a major _____ to our unique natural environment. They threaten the survival of hundreds of _____ and _____ in NSW alone. They also impact on the _____, _____ through allergies and asthma, _____ and the NSW _____.

A general _____ duty applies to all _____ in New South Wales. Many of the following _____ have both _____ and _____ priority _____ duties.

Early _____ and _____ offer the most _____ and _____ form of weed management. If you see a plant which you think is out of place and might be a weed, _____ out _____ it is.

Go to [Your role in Biosecurity](#) the NSW DPIRD webpage to complete questions 2-3.

2. In your own words explain what biosecurity is and the role of every person in managing biosecurity.

3. List the four steps in being biosecure.

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4. In your own words make a definition for a weed and give an example.

Integrated weed management

Read the following excerpt adapted from the Australian Government site, '[Weeds Australia Managing weeds](#)'.

Integrated weed management strategies can be categorised into:

- Biological control methods:** biological control approach makes use of the invasive plant's naturally occurring enemies. These natural enemies of weeds are referred to as biological control agents and include insects, mites and diseases.

Biological control is an economical, effective and environmentally sound method, but is a long-term technique with extensive development and establishment phases. Biocontrol *does not eradicate a weed*, but can *reduce, or suppress* a weed to an acceptable level where it can be controlled with other methods. For example, Cactoblastis Moth (*Cactoblastis cactorum*) to control Prickly Pear (*Opuntia stricta*).

It is critical that biological control agents introduced into Australia do not become pests themselves. Considerable testing is done prior to the release of biological control agents to ensure they will not pose a threat to non-target species such as native and agricultural plants. (Source: [Biological control, Australian Government, 2020](#))
- Cultural control methods:** Cultural control is usually associated with farming systems, although some elements are relevant to landscape and Bushcare practices. It largely involves manipulating farming practices to *suppress weed growth and production*, while promoting the development of the desired plant.

The principles and techniques used to prevent weed spread between different land areas are relevant to cultural control methods. For example, use increased seeding rates and narrow row spacing to outcompete a weed with a desired plant. (Source: [Cultural control, Australian Government, 2020](#))
- Physical control methods:** Physical control is the removal of weeds by physical or mechanical means, such as mowing, grazing, mulching, tilling, burning or by hand. The method used often depends on the area of weeds to be managed, what the land is used for, physical characteristics and the value of the land.

It is important that, when using physical control, any item that can move from a weed-infested site to an un-infested site, such as machinery, vehicles, tools and even footwear, is cleaned free of weed seed before moving, to stop the spread of weeds to new areas.

As with most control methods *long-term suppression* of weeds requires follow up weed prevention. (Source: [Physical control, Australian Government, 2020](#))
- Chemical control methods:** Although the *use of chemicals is not always essential, herbicides can be an important and effective component of any weed control program*.

In some situations, herbicides offer the only practical, cost-effective and selective method of managing certain weeds. Because herbicides reduce the need for cultivation, they can prevent soil erosion and water loss, and are widely used in conservation farming.

In some cases, a weed is only susceptible to one specific herbicide and it is important to use the correct product and application rate for control for that specific weed. Common mistakes include incorrect identification of the weed or using inappropriate products.

In most cases, weeds must be actively growing to be vulnerable to herbicide treatments. Herbicide resistance can also be an issue with some species. (Source: [Chemical control, Australian Government, 2020](#))

5. Define Integrated weed management (IWM).

The following diagram illustrates how herbicide resistance in a weed population develops in a producer's paddock over time. Use the diagram to answer questions 6-7.

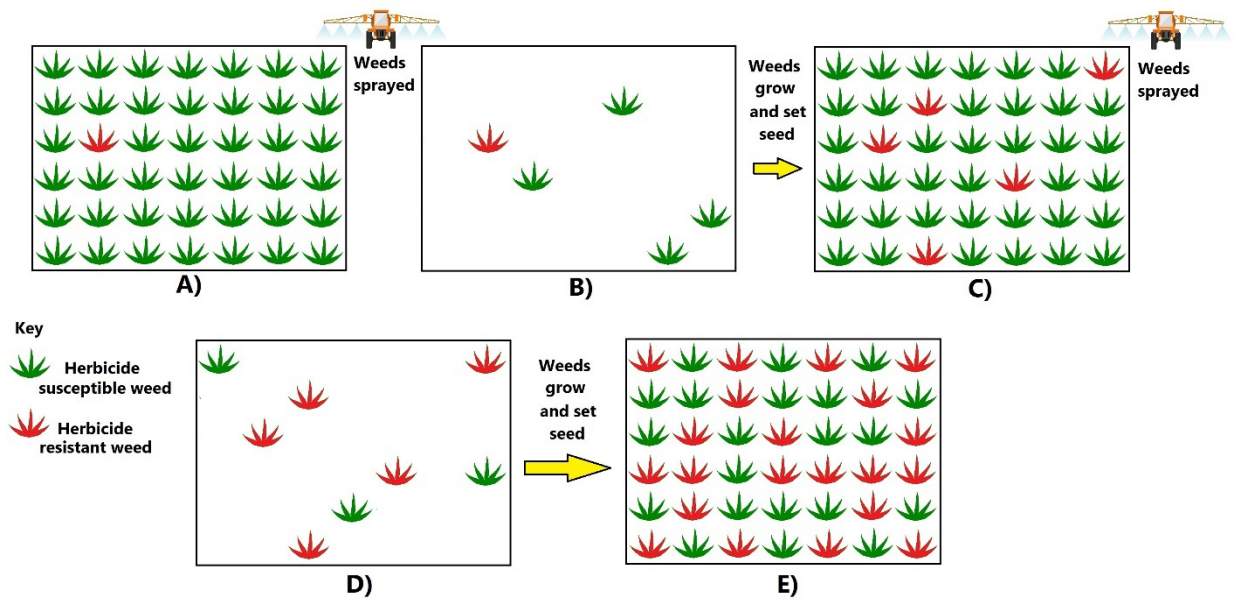


Figure 1 Herbicide resistance

6. Describe what happened at labels A)-E) in the diagram.

7. What could the producer have done to prevent the herbicide resistant population scenario at part E) in Figure 1? Give examples.

8. Explain why it is important to not only use chemical control in pest control strategies.

10. In an Integrated weed management program, should any one strategy (biological, cultural, physical and chemical) be used on its own to suppress a weed? Why or why not?

11. Use information from the '[Integrated weed management](#)' webpage and your understanding of biological, cultural, physical and chemical control strategies in IWM, to complete the following table.

Instructions: match the headings to the four IWM control strategies. Then, give a description of the practice and points for when it is practical and effective. To assist, some examples have been given.

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|--------------------------------|----------------------------------|
| • Inundate biological control | • Slashing |
| • Classical biological control | • Mulching |
| • Flaming | • Fire |
| • Steaming | • Reafforestation |
| • Goats | • Grazing and pasture management |
| • Contact herbicides | • Crop management |
| • Translocated herbicides | • Weed hygiene |
| • Cultivation | |

Integrated Weed control strategy	Name of practice	Description of practice	When is it practical and effective?
Biological control	Inundate biological control	Involves use of mycoherbicides (plant pathogens such as rusts and fungi), applied as a treatment. They act like a species-specific natural herbicide, are not self-sustaining and have a short active period.	• Inaccessible areas such as timbered, rocky and steep locations • Areas of low priority for control • Situations where biocontrol is the only option, for example sensitive aquatic areas Situations where chemical control may be too expensive or not effective
Cultural control	Reafforestation	Reafforestation is a long-term method of weed control, where a dense tree canopy is formed to restrict sunlight penetration to weeds on the forest floor. Reafforestation can be in the form of revegetation with native species or through establishment of plantation forests. A weed control program can involve agro-forestry principles, which include growing trees in conjunction with other agricultural enterprises such as cropping or domestic animals.	Reafforestation is suitable over large areas where other forms of weed control are uneconomic or impractical.

Physical control	Flaming	Liquefied petroleum gas or propane is used in flame weeders. The process does not require a weed to be burnt, but ruptures the plant's cell membranes by raising its water content to temperatures to above 100°C. Small seedlings are generally more susceptible to flaming. Species with upright habits and thin leaves are more sensitive than species with a low stature and protected growth points.	• Weed control on organic farms • Pre-emergent weed control in carrots and other slow-germinating row crops • Selective post-emergent control in heat-tolerant crops • General weed control on hard surfaces in urban areas.

Chemical control	Contact herbicides	Contact herbicides kill the parts of the plants they are applied to - usually limited to leaves and stems of the plant. They are more effective on annual weeds or on seedlings of perennial weeds. Contact herbicides can be either selective (i.e. they only kill broadleaf plants) or non-selective (i.e. they kill all plants).	Plants need to be actively growing when contact herbicides are applied, and good coverage is required to achieve effective results. Contact herbicides include paraquat and diquat.

Weeds investigation

Instructions:

- Select two weeds which affect your local area, from [the NSW DPIRD 'Weeds in NSW' poster](#) to further investigate
- Do not research multiple species from the same weed category.
- For each species, use research to complete the following:
 - Common name
 - Scientific name
 - Description of the plant (including mature plant, flowers, seeds etc. Images can be used to assist the description).
 - Description of how it spreads.
 - Description of where it is found (a map could be used to assist this description).
 - Description of how it affects production, the environment or the economy.
 - Summary of your biosecurity duty regarding this weed, specific to your local area.
 - Make an Integrated Weed management calendar of operations for your chosen weed specifically for your local area. Your calendar must include:
 - A timeline for a minimum of one year (dependant on the weed).
 - Highlight when different control strategies are carried out to suppress the target weed.
 - Brief explanation as to why each control method is carried out at that time of year.
 - Include multiple control methods from each of the categories biological, cultural, physical and chemical.
- Compile your findings into a digital report, for example a brochure or weed fact sheet.
- Recommended website: [NSW Weedwise](#), Department of Primary Industries

Agricultural Technology Years 7-10 Syllabus, 2019

Outcomes	Content
AG5-2 explains the interactions within and between agricultural enterprises and systems	Core A: Introduction to Agriculture research the required assets, infrastructure and management techniques required for plant and animal production (ACTDEK047)
AG5-3 explains the interactions within and between the agricultural sector and Australia's economy, culture and society	Plant Production 1 - identify plants relevant to agricultural production, for example: – important plant crops in Australia, eg wheat, barley, oats – importance of legumes in pastures – commercially grown bush plants eg wattle, sandalwood - evaluate current agricultural methods relevant to the chosen plant enterprise in terms of environmental sustainability, for example: (ACTDEK044) – minimum tillage/tramlining – integrated pest management – flood irrigation
AG5-4 investigates and implements responsible production systems for plant and animal enterprises	
AG5-6 explains and evaluates the impact of management decisions on plant production enterprises	