



Potatoes - management strategies for pests and diseases

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Control of pests and diseases in potato crops can be achieved using biological, cultural and/or chemical methods. Control is not exclusively dependent on the use of agricultural chemicals and more industries are gradually appreciating the benefits of an integrated approach, where both chemical and non-chemical treatments are used in an overall control strategy.

Cost-effective, safe strategies for control of pests and diseases are essential to maintain production efficiency and quality. Current crop management techniques can be some of the simplest control methods. They include practices such as irrigation at strategic times in the growing season, rolling the soil to prevent cracks forming, or just good crop hygiene. The cultural practices employed in potato crops will depend on the dominant pests and diseases in the area.

Note: It is essential that pests and diseases be correctly identified before management strategies are implemented!

Agriculture Victoria, Knoxfield offers diagnostic advice on a fee-for-service basis (phone 03 9210 9222).

In some cases, crop management techniques may contradict each other. Two critical steps to follow in deciding which techniques best suit your crop are:

1. Look at the history of the paddock and determine what pests and diseases were common in previous years; and
2. The pests and diseases of most concern should be the ones for which preventative measures are applied eg. if powdery scab was prevalent in previous years, irrigation should be withheld around tuber set.

The following table shows which management practices apply to each crop stage and why.

Table 1. Management practices for each crop stage

(Note: P&D = pests and diseases)

CROP STAGE	ACTION	REASON
1. Before planting	Review paddock history and identify which P&D have been the biggest risks in the past (particularly soil-borne ones)	This will determine which P&D the crop may be exposed to and therefore the most appropriate methods to use
	Clean up crop area and remove weeds and self-sown potatoes	Weeds and self-sowns harbour viruses, insect pests and diseases which can be transferred to the new crop
	Avoid continuous cropping with potatoes (minimum 2 years between crops)	Reduces the build-up of p&d in the soil
2. Planting	Plant certified seed	Certified seed is grown under strict hygiene regulations and will reduce the risk of introducing seed-borne p&d to the crop
	Plant varieties which are less susceptible to powdery scab or common scab	In paddocks where scabs have been present in the past, less susceptible varieties will reduce disease risk
	Change planting depth according to relative risk of P&D	Deep-setting varieties are less susceptible to potato moth attack
		Shallow planting will help reduce <i>Rhizoctonia</i> infection
Plant in optimum conditions of soil temperature (16-20°C) and soil moisture	High temperature and high moisture can lead to seedpiece breakdown (especially in Coliban)	
	Low temperature and high moisture favours infection by <i>Rhizoctonia</i>	

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CROP STAGE	ACTION	REASON
3. Hilling	Maintain and improve soil structure and create well-drained hills	Poorly-drained soils which are easily saturated favour development of diseases like powdery scab, blackleg and phoma (gangrene)
	Maintain good soil cover throughout season	Good soil cover acts as a barrier, preventing exposure of tubers to potato moth and greening
	Monitor P&D throughout season	Control measures are only required when pest populations reach a critical level
	Monitor beneficials and release if necessary	
4. Irrigation / rain	Check soil coverage of tubers regularly throughout season	Rolling and hilling prevents greening of tubers as well as protecting them from p&d attack
	Manage irrigation to avoid P&D attack	Paddocks with a history of powdery scab should not have saturated soil during tuber set
		Paddocks with a history of common scab should have moist soil during tuber set
	Avoid water stress	Maintaining good crop health makes plants less susceptible to p&d attack (especially black dot)
5. Die-down / slashing	Maintain soil barrier using irrigation/rolling	Prevents greening, potato moth attack and late blight
6. Harvesting	Ensure tubers are mature before digging	Mature tubers have a protective skin which reduces the risk of infection
	Harvest as soon as possible after maturity	Increased time in the ground increases risk of exposure to p&d (eg. <i>Rhizoctonia</i> , silver scurf, black dot, wireworm)
	Handle tubers carefully during harvest	Damage to tubers creates an entry point for disease (eg. Phoma, dry rot, soft rot)
	Harvest under cool (12-18°C), moist conditions	Hot and dry, or cold, conditions increase damage to tubers and the risk of rots
7. Post harvest	If tubers were very wet at harvest, place them in a drying tent with circulating warm air until dry	Free moisture on tubers increases the risk of rots and of seedpiece breakdown
	If tubers were cold at harvest or have just been removed from cool storage, warm them to at least 12°C before grading or cutting for seed	Handling cold tubers is likely to damage them and increase the risk of disease
	Handle tubers carefully during grading and inspection	Damage to tubers increases risk of infection and can make them unsaleable
	If tubers are to be coolstored, cure them beforehand by holding them at 14-16°C and 85-95% relative humidity, with good airflow, for 10-14 days	Curing heals skin wounds and reduces the risk of storage rots (eg. Phoma, dry rot)
	Don't retain tubers for seed	Non-certified seed increases chances of p&d (especially viruses) developing in next season's crop
	Store tubers at optimum temperature and humidity (3-4°C for seed; 4-10°C for ware; 10°C for processing tubers; 85-95% relative humidity for all)	Storing tubers under optimum conditions minimises disease and prolongs storage life

Hygiene in the shed

A potato handling shed is a source of disease. The fungi and bacteria that cause disease on potatoes can be found:

- in the dust that coats the shed floor, ledges and everything else; and
- on grading rollers, seed cutting blades and the insides of boxes which have had diseased potatoes smeared over them.

The shed will also contain huge numbers of airborne spores produced by fungi such as silver scurf, and so overall there is a high potential to contaminate clean seed stocks. This issue is just as important for commercial growers as it is for seed growers.

Dust removal

The **regular** removal of dust (morning, noon and night) with a vacuum cleaner is recommended to minimise contamination of seed during grading.

Sweeping is not the answer, as this just redistributes the dust.

Cleaning and high-pressure washing

Cleaning and high-pressure washing are most important to minimise contamination of grading equipment, boxes and seed cutters (which should be cleaned between seed lots and between different generations) and the floors and walls at the end of the season. Disinfectants can also be effective, but may not be required in many instances.

Situations where a disinfectant is needed, and the best disinfectants to use, are currently being identified.

Thrips

Thrips are sometimes a problem in potatoes. They are of particular concern in seed crops because certain species (particularly onion thrips and western flower thrips) are responsible for virus transfer. Risk of virus infection will be reduced through crop management techniques like removing weeds and self-sown, planting certified seed and maintaining good crop nutrition.

(see also Agriculture Note AG0891 "Tomato spotted wilt virus in potatoes")

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