Strategies for weed management in berry crops

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Weeds are an almost inevitable part of growing crops, however developing an effective management strategy can help improve plant health, reduce labour efforts and limit costs. Weeds can block irrigation lines, compete for essential water and nutrients intended for the primary crop or be an alternate host for pests and diseases that can transfer to berry plants, impacting plant health, yield and fruit quality.

In more severe cases, weeds can also grow within the crop, reducing the amount of light reaching the leaves and fruit, and can impact photosynthesis and fruit colouring. Weeds growing within the plant can also be difficult to remove, particularly during harvest when hand weeding can result in fruit being knocked off or damaged.

It is always a good idea to prepare your weed control strategy in advance of the season before they become an issue, as prevention is always easier than control. Spring and summer are when weeds often become a challenge as temperatures increase and fertiliser is applied to crops. Despite our best efforts, water and nutrients intended for berry crops often create an ideal environment for weeds to grow.

Cultural and physical weed control

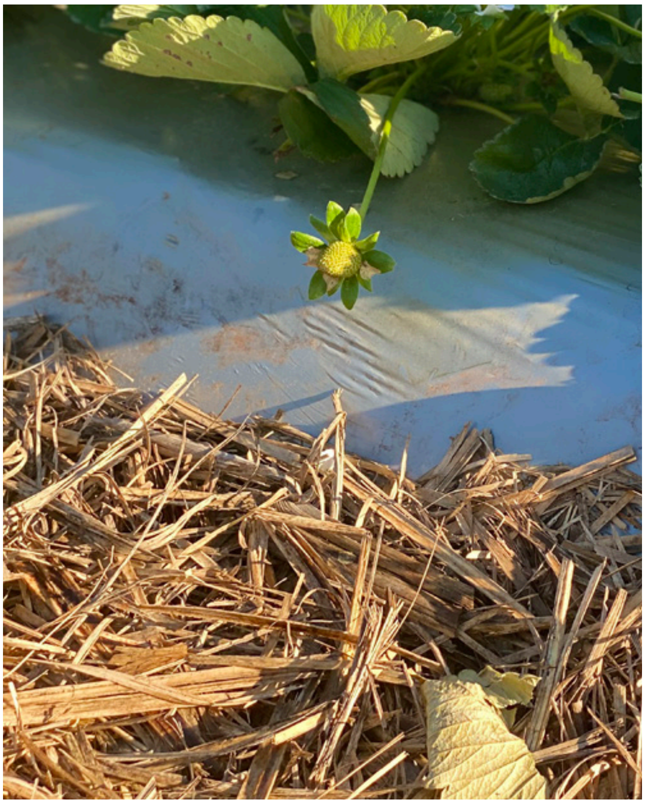
An effective weed control program will utilise a wide range of management strategies to help prevent or reduce weed growth and its impact on the crop. While chemical herbicides can be effective at controlling weeds if used well, alternative control methods should be the first consideration for growers as it helps prevent initial weed growth and the extent of chemical control needed through the season, consequently reducing labour and chemical costs. Cultural and physical control is also an important part of weed management in organic and low spray growing systems where the use of chemical products is limited.

Natural mulch ground covers

Natural mulches such as woodchips supress weed growth and are a popular option on many farms. Natural mulches also help prevent drying out of the soil surface, thereby improving soil moisture distribution in the soil and improving soil conditions for root development. The breakdown of natural mulches over time also provides organic matter in the soil, improving soil structure, drainage, provides plant nutrients and improves the cation exchange capacity of the soil, meaning the soil can hold more nutrients for plant uptake. However, natural mulches are generally most effective in the first year after application and efficacy declines over time as the mulch breaks down and needs to be reapplied every few years in an ongoing program.

Synthetic weed mat covers

Synthetic weed mat covers can provide a barrier for weeds to grow and make it difficult for seeds to land and germinate. Synthetic weed mats provide longer term weed control and are popular in many berry crops as they can be relatively cheap to apply, however these also require specialised machinery to install over large areas. While synthetic weed mats provide good weed control in the covered areas, weed management is still required around the planting holes, such as through the use of natural mulch, herbicides or hand weeding.



(L) Sugar cane mulch used to suppress weeds in the inter-row at an organic strawberry grower in Queensland and (R) natural mulches suppress weed growth and provide a range of other benefits such as preventing moisture loss from the soil surface and provide a source of organic matter used at the base of blueberry bushes when planted in ground. Photo credits: Jane Richter and Ella Roper

Hand weeding

Hand weeding is generally one of the last options for growers as it is labour intensive, time-consuming and expensive to undertake. However, it is generally very effective for most weed species and often necessary when dealing with larger weeds that cannot be controlled with cultural methods or where herbicides cannot be used. Hand weeding is generally undertaken around the plants where herbicides are avoided due to the risk to new shoot growth.

Prevent weeds from going to seed

Recognising the different types of weeds on farm and the stage of growth is important as weed species can be targeted more effectively. Having a good understanding of the lifecycle of major weeds and when they establish through the year helps to target weed control methods at the right time and prevents weeds from going to seed, further adding to the seed bank in the soil.

Ensuring the inter-rows are planted with suitable pasture species helps prevent weeds establishing and producing further seed within the crop. Mowing or slashing of inter-rows where possible helps prevent taller weeds from flowering and dispersing seeds that can establish within the crop. An example is flick weed (Cardamine hirsute L.), which reproduces quickly and develops seed pods that rupture and expel seeds over a significant distance and should be controlled prior to seed development.

Weeds in substrate pots

Weeds in substrate pots can be a major challenge to manage, particularly in perennial crops where plants are grown in pots for multiple years. The weed seedbank within the pot can increase over time, and the tight root-ball can make it difficult to pull weeds out by hand. Prevention is the best method in substrate and there are various physical and cultural management options available, to prevent or slow the growth of weeds.

(L) Weeds in inter-rows can spread into crop mounds if not managed early and (R) Herbicide applied in bands beneath tabletop strawberries helps to limit weed growth under plants. Photos credit: Mark Salter

Ensuring plants are potted into substrate media that is certified and free of weed seeds helps prevent weed development. Coir weed mat discs to fit the pot dimensions and fit around the plant can be purchased from a variety of suppliers and can be customised to fit irrigation emitter needs. Natural mulches can also be used on the top of pots to slow weed growth and impede weeds from landing on and germinating in the pot. A coarse mulch that resists breakdown and inhibits seed germination would be best suited. There are limited registered herbicides available for use in pots, although given the proximity, care should be taken to avoid injury to berry plants.

Chemical weed control

Chemical herbicides often provide a more economical means of control and can be very effective if used well. There are a variety of herbicides available with different modes of action that kill or limit the growth of weeds. Understanding the types of herbicides available for the specific weeds in the crop is important to plan when and how to apply for optimal weed control and to minimise application costs.

Pre- vs Post-Emergence Herbicides

Pre-emergent herbicides are applied to the top layer of soil and inhibit the germination of weed seeds. There are various pre-emergent herbicides with different modes of action, affecting root and/or shoot growth. Pre-emergent herbicides are generally required for application to bare soil and require adequate rainfall or soil moisture for uptake via roots. *Example: oryzalin*

Post-emergent herbicides are herbicides that act on plants or weeds after they have germinated. They work in a variety of ways but often require actively growing weeds for uptake and control. They are best applied when weeds are small and more susceptible to herbicide. Applying when weeds are small also reduces the amount of herbicide needed for effective control. *Examples: carfentrazone, glufosinate-ammonium*

Selective vs Non-Selective Herbicides

Non-selective herbicides or broad-spectrum herbicides are toxic to a wide range of plant species. *Example: glyphosate*

Selective herbicides generally have activity on select weed species and can be used to kill target weeds with minimal impact to the main crop. Often selective herbicides will target grass or broadleaf weeds only.
Example: fluazifop-P

Translocated vs Contact Herbicides

Translocated herbicides move from the site applied through the plant transport systems (phloem or xylem) to other parts of the plant, disrupting plant growth and internal biological processes.
Example: glyphosate

Contact herbicides destroy leaf tissue at or near the site the herbicide is applied and have limited movement within the plant. Contact herbicides require even and thorough coverage for effective control and can be selective or non-selective.
Example: glufosinate-ammonium

Check the APVMA website at portal.apvma.gov.au/pubcris for the full list of approved herbicides on label and permit in your state

Things to consider when using herbicides

Timing: While weeds can grow at any point through the year, winter is generally a good time to control many weed species as Rubus and blueberry plants are dormant, and there is less risk of injury to the crop. Herbicide use in spring needs to be done with care particularly in crops where new shoot growth is encouraged as contact herbicides can injure or kill new growth. Mature blueberry and Rubus plants are also generally more tolerant to herbicides than younger plants, particularly around hardened lignified wood, although injury can still occur.

Rates of application: Herbicide rates are an important consideration, and some registrations will provide a rate range depending on weed characteristics, such as species, stage of growth or density.

Equipment: Consider the types of equipment on the farm and whether it is sufficient to cover area in an adequate amount of time before weeds become an issue again and require further action. There are various types of spray units designed for tractor towing and other equipment which can cover large areas more quickly. Backpack sprayers are slower to use but enable the operator to target weeds more selectively through spot-spraying. Check product label for approved application equipment.

Withholding period: As with any chemical applied to the crop, herbicides also have withholding periods, a minimum length of time within which the crop cannot be harvested to ensure compliance with MRL limits. Some herbicides have short or no withholding periods while others require long intervals (e.g. FUSILADE Forte®) and care must be taken to ensure the withholding period does not impact when you want to harvest.

Spray drift risk: Herbicide spray drift is the movement of small herbicide droplets through the air away from target weeds to the main crop and other plants. Canopy parts most at risk of damage are soft new shoots, leaves and reproductive parts such as new Rubus suckers and young blueberry shoots. Lignified (i.e. hardened) wood in Rubus and blueberry is generally more resistant, although damage can still occur. Tranlocated herbicides pose a greater risk than contact herbicides which produce more localised damage and extra care should be taken particularly when using non-selective translocated herbicides. Spray drift is influenced by product volatility, type of equipment and nozzles used, amount of active ingredient and weather conditions.

To minimise spray drift, select nozzles that minimise the number of small droplets produced but still provide sufficient coverage. Avoid spraying in windy conditions, target 3 – 20 km/h wind speed for spraying and avoid spraying in very low Delta T conditions which can prolong the lifespan of droplets and cause drift. Certain adjuvants can also help to reduce drift when applied with herbicides.

Adjuvants: Some herbicide labels require the addition of certain adjuvants when spraying to improve herbicide performance or prevent spray drift.

Chemical rotation: Rotating available herbicides with different 'modes of action' helps reduce the risk of weeds developing resistance to herbicides.

Herbicide interactions: Be aware of potential herbicide interactions, such as avoiding using translocated herbicides immediately following a contact herbicide as active living growth is required for the herbicide to work. For more information about Herbicide Resistance Strategies visit www.croplife.org.au/resources/programs/resistance-management/herbicide-resistance-management-strategies

Other considerations: Some herbicides (e.g. Basta®) can remain active or inert on surfaces such as plastic mulch and therefore extra care should be taken as plant contact with sprayed plastic can result in crop damage.

Herbicides currently registered and on permit for berries

Crop	Chemical	Target	Timing	States
Blackberry Raspberry	Carfentrazone (e.g. Spotlight®) Plus	Sucker control	Post-emergence	All States
Blackberry Raspberry	Carfentrazone & Glufosinate (HELLCAT®)	Inter-row area	Post-emergence	All States
Raspberry	Dichlobenil (e.g. CASORON 4G®)	Annual grass & broadleaf weeds	Pre-emergence	Tas only
Blueberry Strawberry	Fluazifop-P (e.g. FUSILADE Forte®)	Grass weeds	Post-emergence	Blueberries: Label: Qld only; PER86586: NSW, ACT, NT, SA, TAS & WA Strawberries: All States
Blueberry	Flumioxazin (e.g. CHATEAU®)	Grass & broadleaf weeds	Pre-emergence	All States
Blackberry Blueberry Raspberry Strawberry	Glufosinate (e.g. Basta®)	Rubus only: Primocane & sucker control	Post-emergence	NSW, ACT, VIC, TAS only
		Grass & broadleaf weeds	Post-emergence	All States
Blueberry Raspberry	Glyphosate (e.g. Roundup®)	Various weeds	Post-emergence	Depends on formulation
Blueberry	Haloxyfop (e.g. Verdict®)	Grass weeds	Post-emergence	All States
Blackberry Blueberry Raspberry	Oryzalin	Various weeds	Pre-emergence	All States
Raspberry Strawberry	Simazine	Various weeds	Pre-emergence	All States

Herbicides registered for use in orchards have not been included in this table.

Disclaimer: All efforts have been made to provide the most current and accurate information about these registered chemicals, however Berries Australia recommend that you always confirm the details at the APVMA website portal.apvma.gov.au/pubcris prior to using any chemical covered by these registrations or permits.

Fruit Growers Tasmania