



Strawberry weed control guide

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Weeds compete with strawberries for light, moisture and nutrients. They can be a source of disease, provide a shelter for insect pests, make harvesting difficult, contaminate fruit and reduce both yield and fruit quality. Western flower thrips, a new insect pest in strawberries, is commonly found on flowering weeds such as white clover and milk thistles. The insects move onto strawberry plants when weeds die and can cause major crop losses.

Weed management is an important part of commercial strawberry growing. An effective weed control program needs to be in place both before planting and during the growing and fruiting periods.

PRE-PLANTING SOIL PREPARATION

Weed control starts with proper soil preparation at least four to five months before planting. The site must be well-prepared, with initial cultivation to a depth of 30–40 cm followed by up to two light surface cultivations, and allowed to lie fallow for between 4–6 weeks.

Further light soil cultivation, or the use of knockdown herbicides before bed formation, can help control weeds that emerge during this period.

Fumigation

Soil fumigation is usually carried out before planting in ground where strawberries, or crops that are susceptible to similar soil-borne diseases as such as verticillium wilt, have previously grown. These crops include tomatoes, eggplants, capsicums and potatoes.

Fumigation also helps control weeds, and is effective in the control of difficult weeds such as nut grass. Apply at least two to four weeks before planting to allow the fumigant to be effective and dissipate in the soil. Allow a greater interval (plant-back time) between application and planting in heavier soils and during low soil temperatures. If there is too short a period between fumigation and planting, the chemical remaining in the soil can damage the roots of newly planted strawberries.

Weed control in beds

Black or white polythene mulch laid on raised strawberry beds before planting will prevent weeds becoming a serious problem. Planting should be completed as soon as possible after planting holes are made in the mulch: if planting is delayed, weeds may emerge through the planting holes. They can be removed by hand or sprayed with a knockdown herbicide. Any weeds growing around the crown after planting need to be removed by hand before they become established and crowd out plants. Once the strawberries are well established, weeds are generally no longer a problem.

Smaller holes can be used to reduce weed growth, but they make planting more difficult and can damage the young plant if wind movement causes the plant to rub against the mulch. Alternatively, two cuts in the mulch of five to six centimetres in length and at right angles to each other can be made. This creates four triangular flaps that will help reduce light penetration around the base of the plants and therefore reduce weed growth.

Polythene mulch not only gives good weed control but also reduces evaporation from the soil, and prevents fruit losses during wet weather. The fruit is not contaminated with soil and makes picking easier. Where mulch is used, picking can be brought forward by up to two weeks in some districts. Figure 1.

The polythene sheeting used is usually 1.2 m wide, 0.05–0.08 mm thick and stabilised against ultraviolet light. They are available in black, white and clear, and should last for two years. New mulches being developed allow water to penetrate into the beds and are biodegradable.

Weed control in walkways

Walkways between strawberry beds are the main area where weeds can be a problem. Mulching walkways, after the crop establishes, with sawdust, wood shavings or hay, is a good way to suppress weed growth. The high cost of material and labour, and the need to spot-spray after a few months, has reduced this practice amongst producers. Figure 2.



Figure 1. Black polythene mulch used for weed control on wide strawberry beds. Note dripper irrigation lines under mulch.

Non-specific knockdown herbicides are now widely used to control weeds in walkways. They can be used either as a complete treatment for walkways or for spot spraying where necessary. Great care is needed when using such herbicides to avoid spray drift onto strawberry plants, particularly runners in walkways. Affected plants either die or are set back and may not recover. Both yield and fruit quality are reduced on affected plants.



Figure 2. Straw used as mulch in walkway to suppress weed. Such mulch can help reduce frost damage.

Avoid spray drift by using cone shields over spray nozzles on both hand and tractor mounted spray equipment. Figure 3.

Rope wick applicators are a safe way to apply herbicides around plants and can be used on smaller plantings.

Soil-residual herbicides for weed control in walkways are not widely used due to the cost, and possibility of long-term soil residues affecting future plantings.



Figure 3. A 20L hand operated knapsack with shield over nozzles to reduce spray drift. Note operator wearing correct protective clothing

WEED IDENTIFICATION

It is important to correctly identify weeds early and before using any herbicide. Most weeds fall into two categories: grasses and broadleaves. Although most general knockdown herbicides can control a wide range of weeds, some are specific to grasses.

Grasses

Grasses have narrow leaves with parallel veins. They form tufts and usually have their growing points at ground level. The root system is fibrous. The flowers are generally green and not very noticeable. Couch, kikuyu and winter grass are examples of grasses.

Broadleaf weeds

Broadleaf weeds have variously shaped leaves with branching veins. They may have a number of growing tips, which become branches as the plants become older. The root system has a central tap root with numerous smaller roots branching from it. Flowers are colourful and more noticeable than those of grasses. Examples are white clover, fat hen and milk thistle.

HERBICIDE APPLICATION

Consider the following points before applying herbicides:

- Identify weeds that require control—grasses, broadleaf weeds or a combination.

Select herbicides that are registered for use on strawberries.

- Read and follow the label directions.
- Follow any withholding period.
- Use the correct spraying equipment.

Spray equipment needs to be clean, well maintained and calibrated regularly. As a minimum, calibration should be carried out before the start of each season.

Spray nozzles wear out and must be checked regularly and replaced if worn. Incorrect or worn nozzles can waste chemicals, give poor control, damage crops and lead to residues on fruit.

Boom sprayers

Boom sprayers are widely used to apply both selective and pre-emergence

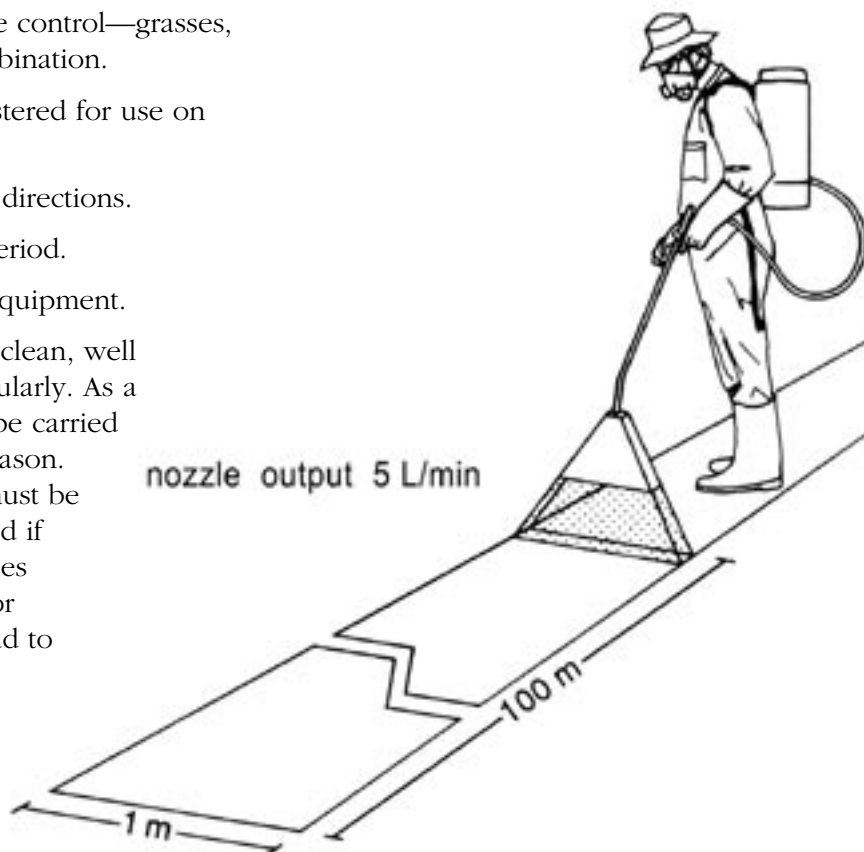
herbicides. The most common arrangement is a spray tank with boom arms and a diaphragm pump mounted on the tractor's power take-off. On the boom arm, spray nozzles are spaced along its length or at the end of a drop-down arm with protective shields around the nozzles. This allows for placement of herbicides below the plant line which helps prevent spray drift.

Flat fan nozzles are used to apply herbicides between strawberry beds. The boom height can be adjusted, depending on the type and height of weeds and the nozzle fan angle. Follow the manufacturer's recommendations for correct boom height and nozzle spacing. Use low pump pressure—around 150–300 kPa (1.5–3 bar) to avoid spray drift.

Knapsack

Knapsacks are often used in smaller plantings and for spot-spraying in larger plantings.

Tank capacity is 15–20 L, and knapsacks can be operated either by hand or with a small motor using flat nozzles. When treating an entire walkway, knapsacks need to be calibrated. To calculate amount of herbicide needed per tank, divide the nozzle output by the area covered for each minute with the knapsack operating, and multiply this by 10,000.



For example, to calculate the amount of chemical needed in a 20 L knapsack:

Nozzle output in 1 minute = 5 L

Area covered in 1 minute = 100 square metres

Recommended rate for herbicide 'x' is 10L/ha

Then:

$$\begin{aligned} \text{Application rate L/ha} &= \\ \frac{\text{Nozzle output each minute (L)} \times 10\,000}{\text{Area covered each minute (square metres)}} \\ &= \frac{5 \times 10\,000}{100} \end{aligned}$$

$$\text{Application rate} = 500 \text{ L/ha}$$

Therefore a 20 L knapsack will cover 0.04 ha (20/500) with 0.4 L of herbicide 'x'

$$(0.04 \times 10\text{L} = 0.4 \text{ L}).$$

Weed wiper (rope wick)

A knockdown herbicide is added to water to make a solution of one part chemical to three parts water. The solution is stored in the handle of the wiper. The rope is kept saturated with the chemical solution and brushed against the weeds. Two applications in opposite directions are needed on larger weeds to achieve best results. Keep the rope wick free of soil and dust. Avoid contact with any part of the strawberry plants.

Safe use of chemicals

- Wear protective gear when mixing and spraying: waterproof boots, gloves, overalls, washable hat and a facemask.
- Wash hands thoroughly with soap and water after each application and before eating or drinking.
- Read and follow directions on label before using any herbicides.
- Spray equipment used to apply herbicides should not be used to apply fungicides and insecticides.
- Avoid spray drift. Use shields around spray nozzles and operate spray equipment at correct pressure and using recommend nozzles.
- Keep records of all chemical applications: chemical applied, application rate, time of application, weather conditions, location and applicator's name.

A range of herbicides is available for the control of weeds in strawberries in New South Wales. For advice on the use and application of herbicides on strawberries contact NSW Agriculture district horticulturists or accredited resellers, or refer to agricultural chemical information database such as InfoPest®.

DISCLAIMER

The information contained in this publication is based on knowledge and understanding at the time of editing (27/05/2004). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Agriculture or the user's independent adviser.

FURTHER READING:

Agfact H3.AC.1 Strawberry fertiliser guide

Agfact H3.3.1 Strawberry disease control guide

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