

Managing Persistent Weed Problems in Strawberries

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Weed management is one of the greatest challenges a strawberry grower faces. The most common reason for plowing down a strawberry bed is weeds. A critical first step in managing weeds is to plant where the weed pressure is low, e.g. a site that has had well managed cover crops and/or cash crops that either smothered weeds or allowed effective cultivation.

Late planting is another strategy can help to manage weeds in a new strawberry bed. The ground is prepared in the fall or in the early spring, and the first flush of spring weeds is allowed to germinate before planting. These are killed by light cultivation, contact herbicide or flaming. Eliminating the first flush of weeds and planting into a warmer, drier soil, reduces the need for early cultivation and hand weeding. However, delaying planting by four to six weeks can also reduce the quality and performance of your stored strawberry plants, so you should work with your nursery to have the plants stored and shipped appropriately.

Strip or zone tillage is another strategy for managing weeds in the planting year. A thick cover crop of oats or winter rye is grown the year prior to planting, and killed in the spring, leaving the plant residue undisturbed on the soil surface except for narrow (8-12") strips or zones tilled for the strawberry plants. Leaving most of the soil surface covered with a heavy plant residue prevents weed seeds from germinating. Zone tillage requires specialized equipment to make planting strips, which is expensive and heavy, requiring a fair amount of horsepower. As the residue breaks down over the season, weeds once again become an issue, and additional control measures will be needed.

For weed management following harvest, growers have developed renovation schemes for that reduce the typical flush of weeds that follows renovation by eliminating tillage from the scheme. Much of the weed pressure following renovation is due to tillage bringing buried weed seed up to the soil surface. Rather than tilling to narrow plant rows after harvest, contact herbicides or flaming are used. The sprayer or flamer must be adequately shielded to prevent burning the plants in the center of the rows (they should be narrowed to about 8 to 12 inches). Repeated burning will be necessary to manage weeds between the rows through the summer, and regular hand weeding within the rows will also be necessary, but by not tilling the soil, growers are finding that weed pressure in the second year is significantly reduced. Yields tend to be lower and fruit size smaller in the second harvest year with this practice.

The one harvest year rotation is probably still the best option for most organic growers (plant year one, harvest year two, plow down and plant to rotation crops) to manage weed problems in strawberry beds. However, some of the new strategies being developed may allow growers to extend the productive life of strawberry beds and thus improve their profitability.

Herbicides can offer good control of many weeds in strawberries if applied under the appropriate conditions. However, the use of herbicides alone rarely gives complete weed control. Other strategies should always be in combination with herbicides to get the best control of all weed problems. Herbicides registered for strawberries and their applications are listed below.

1. DCPA (Dacthal®): A pre-emergent herbicide used in the early spring, late fall or after renovation. It offers good, short-term control of some annual broadleaf weeds and grasses. It is weak on ragweed, galinsoga, smartweed, shepherd's purse and mustard. Its action will be improved if worked into the soil by irrigation or light cultivation, and it tends to work best in lighter, warmer soils. This may be used as an alternative to terbacil or napropamide when there is a high risk of plant injury from those products.
2. Napropamide (Devrinol®): A pre-emergent herbicide that provides good control of annual grasses, volunteer grains and some broadleaf weeds. It is typically applied just before mulching in the fall. Split applications have become popular due to the loss of other pre-emergent herbicides, e.g. half maximum rate application after renovation or in late summer after desired daughter plants have rooted, and a second half rate application once the strawberry plants are dormant. Napropamide should be worked in by irrigation, rainfall or light cultivation within 24 hours of application.
3. Terbacil (Sinbar®): A pre-emergent herbicide with some post-emergent activity, which should be applied at renovation time – after mowing and tilling the beds, but before new growth begins. A second application can be made in late fall, after the plants are dormant. No more than 6 oz. may be applied in a single application, and no more than 8 oz. may be applied in one season. An example of one season's use could be 5 oz. applied at renovation and 3 oz. applied in the late fall, the latter in addition to napropamide or DCPA. Terbacil can cause plant injury. It is important to determine appropriate rates for each location.
4. Clopyralid (Spur®): One application is permitted per crop per year following harvest to emerged weeds. Apply uniformly in a minimum of 10 gallons of water per acre. Do not tank mix with other herbicides. Clopyralid offers control of clover, dandelion and thistle.
5. Sethoxydim (Poast®): A post-emergent herbicide for control of actively growing grasses. It will not control broadleaf weeds. It should not be applied when grasses are under stress, e.g. drought, or on unusually hot, humid days. Do not use sethoxydim within 6 weeks of terbacil (Sinbar®) applications, to avoid leaf injury. Sethoxydim should be used in combination with a crop oil concentrate. Do not tank mix with 2, 4-D.
6. Clethodim (Arrow®, Prism®, Select®): A post-emergent herbicide, similar in activity to Poast®, for control of actively growing grasses. It will not control broadleaf weeds. It should not be applied when grasses are under stress, e.g. drought, or on unusually hot, humid days. Clethodim should be used in combination with a crop oil concentrate.
7. Paraquat (Gramoxone Inteon®): A contact herbicide for post-emergent control of most annual weeds and suppression of many perennial weeds. Paraquat will injure or kill strawberries, so applications are made between rows only, with a sprayer shielded to protect

the strawberries. It should be used in combination with a nonionic surfactant. Paraquat should not be applied within 21 days of harvest or more than three times in one season.

8. Pelargonic Acid (Scythe®): A contact herbicide for post-emergent control of most annual weeds and suppression of many perennial weeds. Scythe® will injure or kill strawberries, so applications are made between rows only, with a sprayer shielded to protect the strawberries. This product has a relatively low toxicity and no residual soil activity. It has a strong, unpleasant odor.
9. 2,4-D Amine (Formula 40®, Amine 4): A post-emergent herbicide effective on most broadleaf perennial weeds. It will not control grasses, nor offer any pre-emergent control. 2,4-D should be applied immediately after harvest is complete if emerged broadleaf weeds are a problem. After application, the bed should be left undisturbed for three to five days, before mowing the leaves off the plants. This allows time for the material to be taken in by the weeds. This material can also be used when the plants are dormant (late fall or early spring) to control winter annuals and biennials. Fall applications may result in injury to the strawberries if the plants are not completely dormant. Do not tank mix 2,4-D with sethoxydim (Poast®).
10. Flumioxazin (Chateau®): A pre-emergent herbicide for control of broadleaf weeds, including dandelion and shepherd's purse. For use in the fall when plants are dormant for control of weeds the following spring. If small broadleaf weeds are emerged, also apply a crop oil concentrate at 1% or a non-ionic surfactant at ¼% by volume. Chateau will control emerged chickweed, field pansy, and oxalis if sufficient contact is made with the weeds. Chateau can also be applied with a hood or shield to row middles of non-dormant strawberries prior to fruit set.
11. Pendimethalin (Prowl H20®): A pre-emergent herbicide that may be applied to the soil surface prior to planting. It may also be applied as a band with a shielded sprayer between the rows of strawberries up to 35 days before harvest. No weed control will be provided within the plant rows, and contact of this product on the strawberry plants will cause injury. Prowl provides excellent control of many annual grasses and several broadleaf species.

Always read and follow all product label information and precautions. Where brand names are used it is for the reader's information. No endorsement is implied nor is any discrimination intended against products with similar ingredients. Users of these products assume all associated risks.