

Strawberry Weed Management Options

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Weed control is an essential part of strawberry culture. The crop is sensitive to competition for light, water, and nutrients. Weeds reduce yield by reducing plant stand, berry number and size, and by interfering with harvest. The public is rapidly discouraged by weeds in U-PICK strawberry fields. A weed control program for a new strawberry planting should combine all the effective cultural, chemical, and mechanical techniques available. The use of recommended herbicides alone is not likely to provide adequate control. Fumigation for disease control will reduce potential weed populations, but cannot completely replace other weed control operations.

Traditionally, the crop is grown using the matted row system in the northeast. Strawberry mother plants are transplanted in the spring. They are set about 15 to 28 inches apart in the row, with rows four to five feet apart. Flower clusters are removed the first year. Runners produce daughter plants during the summer. The result is a bed or row two to three feet wide by early fall. The plants are often mulched in late fall to protect the crowns from winter injury and the roots from damage caused by freezing and thawing of the soil. The mulch is removed or pulled off the plants and left between the rows in early spring to prevent the crop from contacting the soil and to reduce disease infestation. Immediately after harvest fields to be kept in production another year must be renovated. Old foliage is removed by mowing. Plant populations are reduced to maintain vigor and berry size by reducing row width and/or converting field to the ribbon row system by eliminating plants in center of the row. Fertilizer is spread to encourage vigorous growth, and additional herbicides are applied to control weeds for the remainder of the year.

The ribbon row is a modification of the matted row system that increases the number of plants set per acre. The plant density in the row is doubled, and a double rather than a single row is sometimes planted. The weed control program for the traditional matted row system of strawberry production and the higher density ribbon row system are similar. Both should be separated into two programs, one for newly planted fields and another for established plantings. Use care when spraying everbearing varieties to be sure all preharvest intervals are observed.

The annual system, commonly used in California and Florida, utilizes raised beds, plastic mulch, fumigation, and trickle irrigation. It has attracted attention in the northeast and some growers have switched, but there are drawbacks, especially for the direct marked grower. The flavorful strawberry varieties customers look forward, to do not respond to the more costly annual system with higher yields, and switching to the varieties grown in California and Florida can result in reduced customer satisfaction.

Weed control in strawberries is difficult, but results can be improved by advance planning. Conduct a weed survey and identify the weeds in the field before planting

strawberries. Established perennial weeds, including yellow nutsedge, must be controlled BEFORE planting strawberries! Success may require action the year prior to planting or for several years before strawberries are established. Rotate to crops with effective recommended herbicides, and/or the use of nonselective systemic herbicides according to label instructions. Consult your local Cooperative Extension agent for cultural practices, crop rotations, and herbicide recommendations.

Perennial weeds can be controlled without herbicides but success requires diligence and an understanding of the reproductive cycle of the weed. Most perennial weeds reproduce vegetatively as well as by seed. Weeds that have vegetative reproductive structures such as nutrients, bulbs, rhizome, or tubers must be controlled during the period of the year when these structures are produced. In addition, repeated tillage drags these reproductive structures to the surface and exposes them to drying in midsummer and freezing in winter.

Weeds with extensive spreading root systems can be starved to death. Emerging shoots use food stored in the roots to grow leaves. The shoot uses food from the root for the first 7 to 10 days after emergence and begins to send food back to the root after 10 to 14 days. Till the field within 10 days of emergence of the weed to prevent the food supply in the root from being replaced. Continue to repeat the tillage until no regrowth occurs. Be diligent! The control of established perennial weeds using tillage will require months of regular timely tillage operations.

A single missed tillage can nullify months of effort. Cropping options are limited during the tillage period and the field is exposed to erosion by wind and water during the entire period. The most effective control programs for perennial weeds integrate the cultural and mechanical methods with the use of effective herbicide programs.

Utilize stale seedbeds when possible by preparing the field early for planting. Allow weeds to sprout, then till shallowly to control the seedlings and stimulate dormant weed seeds to germinate. Repeat as many times as possible to reduce the weed seed supply in the soil.

New plantings should be tilled immediately before transplanting and a preemergence residual such as Dacthal 6FL or Devrinol 50DF should be applied posttransplant to control annual grasses and certain annual broadleaf weeds. Use 1 to 2 gallons of Dacthal 6FL or 2 to 4 pounds of Devrinol 50DF per acre. Use lower rates on coarse textured soil low in organic matter and higher rates on fine textured soil and soil that is higher in organic matter. Irrigate if rainfall does not occur before weeds emerge to make the herbicide available to the emerging seedlings.

Sinbar 80DF can be applied at 2 dry ounces of product per acre after transplanting but before runners root to control many annual broadleaf weeds. Do NOT add surfactant, oil concentrate, or any other spray additive, or tank-mix with any other pesticide unless the mixture is approved on the Sinbar 80DF label. If strawberry transplants are allowed to develop new foliage prior to application, the spray must be followed immediately by 0.5 to 1.0 inches of irrigation or rainfall to wash the Sinbar 80 DF off the strawberry foliage, or unacceptable crop injury may result. University data has shown that more consistent weed control and less crop injury occurs when 0.05 lb/A, 1 dry ounce of Sinbar 80 DF is applied at 3 week intervals. Begin applications 3 to 6 weeks after transplanting, when the strawberries have 3 new full size trifoliolate

leaves, but before weeds exceed 1 inch in height. Certain varieties differ in their sensitivity to Sinbar. Determine varietal tolerance before spraying field. Do NOT apply Sinbar 80 DF to soils with less than 0.5% organic matter. Do NOT use more than 8 ounces of Sinbar per acre per year unless otherwise directed on the label.

Apply 12 to 16 fluid ounces per acre SelectMax with nonionic surfactant to be 0.25% of the spray solution (1 quart per 100 gallons of spray solution), or 1 to 2 pints per acre Poast postemergence with oil concentrate to be 1 percent of the spray solution (1 gallon per 100 gallons of spray solution) to control many annual and certain perennial grasses. Two applications may be needed to control certain perennial grasses. Follow label instructions. The use of oil concentrate may increase the risk of crop injury when hot or humid conditions prevail. Control may be reduced if grasses are large or if hot, dry weather or drought conditions occur. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. Yellow nutsedge, wild onion, or broadleaf weeds will not be controlled. Do not tank-mix with or apply within 5 to 7 days of any other pesticide unless labeled as the risk of crop injury may be increased or reduced control of grasses may result.

Cultivate frequently and hoe as needed until runners appear. Widen the uncultivated strip in the row as runners grow. Set cultivators to throw soil into the row to anchor the runners and encourage rooting of the daughter plants. The optimum plant population for maximum strawberry yield and berry size is 4 to 5 plants per square foot in the matted row. Consider applying a supplemental preemergence herbicide in midsummer after the desired number of daughter plants have rooted. Use postemergence herbicides recommended for newly planted strawberries when susceptible weeds are observed. Hand pull weeds in the row that cannot be controlled with herbicides.

The weed control program options for established strawberries are limited to chemical weed control and hand weeding by the growth habit of the crop and cultural practices. Herbicides can be applied to established strawberries at three periods of the year; late fall, early spring, and in the summer during renovation.

Late fall herbicide treatments are applied to control emerged seedling winter annual weeds, and for pre-emergence control of annual weeds that germinate in early spring. Always apply 4 to 8 pounds of Devrinol 50DF per acre to prior to mulching to control annual grasses, certain annual broadleaf weeds, and volunteer small grain from the mulch, or be prepared to use a postemergence herbicide to control the volunteer grain in early spring. Devrinol can be tank-mixed with 3 to 4 dry ounces of Sinbar 80DF per acre to control additional annual broadleaf weeds in late fall and through harvest the following spring. Use lower rates on coarse textured sandy soils low in organic matter, and higher rates on fine textured silt and clay soils high in organic matter. Do NOT add surfactant, oil concentrate, or any other spray additive. Do NOT apply within 110 days of harvest. Certain varieties differ in their sensitivity to Sinbar. Determine varietal tolerance before spraying field. Do NOT apply Sinbar 80 DF to soils with less than 0.5% organic matter. Do NOT use more than 8 ounces of Sinbar per acre per year unless otherwise directed on the label. In addition, Chateau 51WDG can be applied at 3 dry ounces of product per acre to control wild pansy, also known as Johnny-Jump-Up, and other annual broadleaf

weeds, provided the field was planted the previous spring. Fields that were renovated after harvest and will be harvested a second year cannot be treated with Chateau if Chateau was applied earlier the same year. Do not use more than 3 dry ounces of Chateau per acre per in one calendar year.

Early spring herbicide treatments should be applied immediately after mulch is pulled off the row, and before the crop breaks winter dormancy. Apply Chateau 51WDG at the rate of 3 dry ounces per acre plus 1 to 1.5 quarts of a labeled 2,4-D amine product to control broadleaf weeds. Do not apply 2,4-D unless possible injury to the crop is acceptable. Do not apply 2,4-D between mid-August and winter dormancy, as it may reduce flower bud formation. In addition, Deverinol can also be applied if none was applied in late fall. If grass weeds appear, apply 6 to 8 fluid ounces per acre Select 2EC or 1 to 2 pints per acre Poast postemergence with oil concentrate to be 1 percent of the spray solution (1 gallon per 100 gallons of spray solution). Follow label instructions. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. Yellow nutsedge, wild onion, or broadleaf weeds will not be controlled. Do not tank-mix with or apply within 2 to 3 days of any other pesticide unless labeled as the risk of crop injury may be increased or reduced control of grasses may result. Observe all PreHarvest Intervals listed on the labels.

Renovation is the annual 'rejuvenation' of the planting. It is accomplished by the elimination of old diseased leaves and weak old plants and applying fertilizer and herbicides after harvest. The procedures for accomplishing these goals may differ, depending on the year, age, condition of the crop, and weeds in the field. Stimulate new growth after harvest by removing old foliage with a sharp rotary mower. Use care to avoid hitting crowns with the mower blades. Apply 1 to 1.5 quarts of a labeled 2,4-D amine product seven days before removing old leaf growth if most of the broadleaf weeds are taller than the crop, and apply 4 to 8 dry ounces of Sinbar apply immediately after mowing. The 2,4-D and the Sinbar can be tank-mixed and applied immediately after mowing if most broadleaf weeds are below the crop canopy. Irrigate within 2 days if rainfall does not occur after application to make the preemergence herbicide available to the emerging weed seedlings, but delay irrigation for 12 hours to allow time for herbicide penetration into the leaves or weed control may be reduced. Use care not to exceed the total recommended rate of any herbicide for an acre in one year.

A **Special Local-Needs Label 24(c)** has been approved for the use of **Stinger 3A** to control weeds in strawberries in New Jersey, New York, and certain other states. The use of this product is legal ONLY if a waiver of Liability has been signed by the grower, and returned to Dow AgroSciences. Apply 2 to 10.6 fluid ounces of Stinger 3A per acre in one or two applications during the spring to control certain annual and perennial broadleaf weeds. Observe a minimum preharvest interval (PHI) of 30 days. When two applications are used to control susceptible hard-to-kill perennial weeds, spray the first application in the spring at least 30 days before harvest and second application at renovation, after harvest. Stinger controls weeds in the Composite and Legume plant families. Common annuals controlled include galinsoga, ragweed species, common cocklebur, groundsel, pineappleweed, clover, and vetch. Perennials controlled include Canada thistle, goldenrod species, aster species, and mugwort (wild chrysanthemum). Stinger is very effective on small seedling annual and emerging perennial weeds less than 2 to 4

inches tall, but is less effective and takes longer to work when weeds are larger. Use 2 to 4 fluid ounces to control annual weeds less than 2 inches tall. Increase the rate to 4 to 8 fluid ounces to control larger annual weeds. Apply the maximum rate of 10.5 fluid ounces, in one or split into two applications to suppress or control perennial weeds, but do not apply more than 5.3 fluid ounces in the spring before harvest or exceed 10.6 fluid ounces in one year. Spray additives are not needed or required by the label, and are not recommended. Do NOT tank-mix Stinger with other herbicides registered for use in strawberries. Observe a minimum preharvest interval (PHI) of 30 days. Stinger is a postemergence herbicide with residual soil activity. Observe follow crop restrictions to avoid herbicide carryover.

Strawberry plants and weeds between the rows can be controlled chemically or mechanically. Heavy mulch between the rows conserves moisture, suppresses annual weeds, and keeps the fruit clean, but may interfere with cultivation equipment. A rolling coulter, a rotovator, or a directed shielded spray of Gramoxone Extra 2.5SC can be used to control unwanted vegetation between the beds. Rotate the nozzle up, to ninety degrees, to control the spray band width. Strawberry foliage, crowns, and weeds contacted by spray will be killed. Use shields and low pressure to avoid drift injury to adjacent plants. Weeds between the rows of plantings managed using the ribbon row system can be eliminated using the same techniques. **WARNING:** This weed control practice will kill strawberry crowns that are sprayed and thin the stand.