

# Crop Profile for Strawberries in West Virginia

**Prepared: November, 2000**

## General Production Information

Strawberries (Rosaceae *Fragaria* spp.) were grown on 57 farms on a total of 67 acres in 1997 (1). The average planting was less than 2.5 acres. With a total of 110,477 pounds produced annually in the state, crop value exceeds \$145,000, each year (1 and 2). The average annual production cost is \$750 and \$1,800 to \$3,000, if fumigation is used (3). Most of the crop is sold directly to the consumer. Generally, customers either pick their own strawberries or buy them at roadside stand markets. U-pick prices range from \$1.05 to \$1.33 per pound while roadside stand prices range from \$2.50-\$3.75 per quart (3).

## Production Regions

West Virginia's strawberry crop is grown in scattered locations across the state. Most of the Mountain State's strawberry farms are located in Upshur, Monongalia, Mineral, Randolph, Lewis, and Grant counties (3).

## Cultural Practices

Strawberries can grow in a wide variety of soils. They prefer a soil pH between 5.8-6.5 and produce the best yields on deep, fertile soil with a high organic matter content. Site selection for strawberry production is important; the site should be well-drained year-round. June bearing cultivars, with fruit ripening from late May until early June, are used by many growers. Most use the matted row system in which strawberry plants are placed 12-18 inches apart on raised beds with 36-40 inches between rows. Some growers, however, plant high density double rows at a rate of 30,000 to 40,000 plants/A. Few growers in the state have gone to raised bed and plastic cultured plants. After planting, flowers are removed to increase plant growth and runner formation. If the soil contains adequate minor and major

elements, applications of 25 to 40 lb./A of actual nitrogen are applied 10 to 14 days after planting with the same amount applied in August to promote flower bud formation. Irrigation may be used several times during the low rainfall period of July and August and in the spring for frost control. Insecticides, miticides, and fungicides may be used for potato leaf hopper, mites and/or on cultivars susceptible to leaf diseases, respectively (4).

Strawberries ripen within 28-30 days after the first bloom and are harvested normally every other day for about six to seven pickings. With proper care, strawberry plants will produce more than one season. Immediately after a harvest ends, the established strawberry field should be renovated to restore vigor and growth. During renovation, it is important to 1) mow off leaves close to the ground so that diseased leaves can be replaced, 2) improve access to sunlight, 3) fertilize (25-40 lbs. of nitrogen/A) for improved berry size, 4) place soil over crown to improve root development, and 5) apply herbicides to control weeds. After runners have set, herbicides can be applied in late summer or early fall and once again before mulching. Mulch is applied to strawberry plants to minimize damage from freezing temperatures. The mulch is then removed in early spring followed by an herbicide application (4).

## Insect Pests

Spittlebugs, strawberry bud clipper, tarnished plant bug, strawberry sap beetle, and potato leafhopper are the most reported strawberry insect pests in West Virginia. Other strawberry pests include the two-spotted spider mite and slugs (3).

### 1. Spittlebugs , Philaenus Spp.

**Damage:** Spittlebugs first feed at the base of plants but later move up to the more tender foliage and blossom clusters during bloom. They pierce the plant and suck on its sap. The yellow to green soft-bodied nymphs produce a frothy material and remain in this protective substance until they develop into adults. The feeding activity causes the plants to become stunted; berries do not attain full size. The spittle mass also can be troublesome to strawberry pickers (4).

**Life Cycle:** Adult spittlebugs will lay their eggs in September and October. The eggs are inserted into the lower parts of the strawberry plant. Nymphs emerge in April and May and complete their development in five to eight weeks. They overwinter as egg masses in strawberry stubble and other hosts such as forage crops. Only one generation of spittlebugs are produced each year (4).

**Chemical Control:** Most producers in West Virginia do not use chemicals to control spittlebugs (3). However, a number of pesticides are recommended for control (5). These include:

Thiodan 50 WP or 3 EC: Applied at a rate of 2 lb./A and 2.6 pt./A, respectively

Sevin 50 WP or 80 S: Applied at a rate of 4 and 2.5 lb./A, respectively

Methoxychlor 25 WP: Applied a rate of 6 lb./A

Danitol 2.4 EC: Applied a rate of 10.67 fl. oz

Brigade 10 WP: Applied a rate of 6.4-32 oz

**Biological Control:** Natural enemies are not abundant and do not seem to aid in control (6).

## **2. Clippers (Strawberry Bud Weevil), *Anthonomus signatus***

**Damage:** Females of the species chew small holes in strawberry flower buds in which they lay eggs. They then girdle the stem just below the bud, causing the bud to wither and fall to the ground (7).

**Life Cycle:** The beetles overwinter in fence rows and woodlots. Once temperatures reach 60 °F, the clippers move to nearby early budding plants, such as strawberries. The adults feed on the immature pollen of the blossom buds; the females then deposit one egg inside the bud. In about a week, the egg hatches into a white, legless grub. The larva develops inside the bud and reaches maturity in three to four weeks. Adult clippers are dark, reddish-brown weevils about 1/10-inch long with a head prolonged to a thin, curved snout about half as long as the body. Clippers emerge from the buds in late June through July. After feeding on the pollen from various flowers for a short time, the new adults seek hibernating sites and remain there until the next spring. Only one generation of clippers appear each year (4).

**Chemical Control:** Recommended pesticides are applied when buds first become visible, and repeated 10 days later (5).

Lorsban 4 EC: Applied at a rate of 2 pt./A

Brigade 10 WP: Applied at a rate of 6.4-32 oz/A

## **3. Tarnished Plant Bug , *Lygus lineolaris***

**Damage:** Both adults and nymphs feed on flowers and developing fruits. Their feeding kills surrounding tissue and leads to small, seedy strawberries with a woody texture that fail to mature. This injury is called "button berry"; the fruits are unmarketable (4).

**Life Cycle:** Adult tarnished plant bugs are 1/4 inch long, brownish and marked with yellow and black dashes. They overwinter in vegetation and stubble that provides protection from the extreme cold. In the spring, the adults are attracted to flower buds and shoot tips of many plants, including strawberries. The females lay eggs in April and early May in the plant tissue. The nymphs emerge in one week and feed on developing seed during and after bloom or from the receptacle of developing fruit. There are several generations of tarnished plant bugs each year, so adults and nymphs can be found from April or May until a heavy frost in the fall (4).

**Chemical Control:** Most producers in West Virginia do not use chemicals to control this insect. However, a number of pesticides are recommended for control (5). These include:

Thiodan 50 WP or 3 EC: Applied at a rate of 2 lb./A and 2.6 pt./A, respectively.

Sevin 50 WP or 80 S: Applied at a rate of 4 and 2.5 lb./a, respectively

Methoxychlor 25 WP: Applied at a rate of 6 lb./A

Danitol 2.4 EC: Applied at a rate of 10.67 fl. oz

Brigade 10 WP: Applied at a rate of 6.4-32 oz

**Cultural Control:** Control measures include weed management in and around the planting. Sites adjacent to alfalfa are avoided. Most growers sample fields for tarnished plant bug populations, paying particular attention to the nymphs, which can be counted by shaking flower clusters over a flat surface.

#### **4. Strawberry Sap Beetle, *Stelidota germinata* (Say)**

**Damage:** Sap beetles infest berries as they begin to ripen, chewing unsightly holes where they feed and reproduce. This injury also can lead to infection of the strawberry by rot organisms (4).

**Life Cycle:** The strawberry sap beetle is a small, brown insect less than 1/8 inch long. Adult sap beetles enter strawberry plantings from the surrounding wooded areas at the time the berries begin to ripen. Adult sap beetles are rarely seen because they fall to the ground when fruit is disturbed. Females lay their eggs on the damaged fruit. The eggs will hatch in two to three days. Larvae will remain in the fruit for about one week, but , since the berry has already begun to decompose, damage done by the larvae usually goes unnoticed (4).

**Chemical Control:** Chemical control is difficult due to restrictions on insecticide use close to harvest. However, an early insecticide application prior to the first picking can delay the peak feeding activity

until harvest. West Virginia's strawberry producers reported no use of pesticides to control this pest. The recommended pesticides that can be used to control the sap beetle include (5):

Diazinon 50 WP, or AG500: Applied post-bloom to harvest at rates of 2 lb./A and 2 pt./A, respectively; has a 5-day pre-harvest interval

Guthion 50 WP: Applied post-bloom to harvest at a rate of 1.0 lb./A; has a 5-day pre-harvest interval

Brigade 10 WP: Applied post-bloom to harvest at a rate of 6.4-32 oz./A; has a 0 day pre-harvest interval

**Cultural Control:** Sap beetle can be controlled during harvest by using bait buckets containing overripe fruit placed in the field between the berry patch and wooded areas (5).

**Biological Control:** Two parasitic wasps, *Microctonus nitidulidus* and *Brachyserphus obruptus*, are known to attack strawberry sap beetle adults and larvae, respectively (6).

## **5. Potato Leafhopper, *Empoasca fabae***

**Damage:** Leafhoppers feed mostly on the undersides of strawberry leaves. This feeding causes the leaves to yellow between the veins and become curled and distorted. Symptoms can be mistaken for early symptoms of infection with strawberry vein banding virus. However, the virus is not vectored by this insect. Most serious damage is done in the late spring and early summer (4).

**Life Cycle:** Leafhoppers are approximately 1/8 inch long, green, bullet-shaped insects that take flight quickly if disturbed. Females deposit eggs in stems and leaf veins, producing two or three eggs a day over a three- to four-week period. Nymphs hatch in 10 days and are fully grown in about two weeks. These nymphs are light green, do not fly, and move sideways when disturbed (4).

**Chemical Control:** A West Virginia producer reported the use of Guthion 50 WP at a rate of 2 lb./A, to control this insect (3).

## **6. Two Spotted Spider Mite, *Tetranychus urticae***

**Damage:** The mites suck sap from the leaves which can cause them to lose their healthy

green color and turn coppery-bronze. This pest usually is not a problem in West Virginia, but can cause significant problems when severe infestations occur.

**Life Cycle:** The adult mite is only about 1/50 inch in length; its color varies from pale greenish-yellow to dark crimson, usually with dark spots. Adults feed and deposit eggs on the underside of the leaf and in a heavy infestation, a tangle of fine, silken threads can be found there. The life cycle of the mite varies but usually is completed in two weeks. New broods can be produced continuously from early spring to late fall. Mite population increases are more severe in hot, dry weather. The mites overwinter as mature fertile females in protected areas in fields (4).

**Chemical Control:** If mites are present, early spring (pre-bloom) control recommendations include (5):

Vendex 50 WP: Applied at a rate of 2 lb./A

Kelthane 50 WP: Applied at a rate of 1-2 lb./A

Danitol 2.4 EC: Applied at a rate of 16-21.3 fl. oz./A

Brigade 10 WP: Applied at a rate of 16-32 oz./A

Agri-mek 0.15 EC: Applied at a rate of 16 fl. oz./A

**Biological Control:** A native predator mite, *Amblyseius fallacis*, is equally small, but has a big appetite. It can be distinguished from the two-spotted mite by the lack of the two spots on its back, its teardrop shape, and its rapid movement across a leaf (8).

## 7. Slugs, *Limax* spp.

**Damage:** Slugs feed on ripening berries, leaving deep, ragged holes on the surface of the strawberry, especially under the cap. Most of the feeding takes place at night or on dark, overcast days. A tell tale sign of slug injury is the slime trail left on the surface of the fruit.

**Life Cycle:** Slugs are soft-bodied, slimy, worm-like mollusks. In the spring, slugs emerge from eggs that were laid in the soil in strawberry plantings during the previous fall; they prefer fields covered continuously with mulch. They overwinter in protected areas in the field, where they increase in number over the years.

**Chemical Control:** Recommended molluscicides can be applied as broadcast, before berries form, or to the soil surface in a band between rows after berries form. These chemicals are best applied in the evening after rain or irrigation (5):

Deadline M-P's (4% bait): Applied at a rate of 10-40 lb./A

Prozap Snail and Slug AG (3.5% bait): Applied at a rate of 12-39 lb./A

**Cultural Control:** Elimination of favorable habitats, (i.e., rocks, boards, leaves, dead vegetation, and excessive mulch), reduces the amount of shelters for slugs. Also, use of fermenting baits with traps, which contain molluscicides, can provide control (6).

### **Critically needed pesticides:**

Pesticides that are recommended for strawberry pest control also play an important role in the Integrated Pest Management program (i.e., cost effective, and resistance management). These pesticides include Endosulfan (Thiodan), Azinphos-methyl (Guthion), and Carbaryl (Sevin).

West Virginia's strawberry producers did not report using newly registered pesticides Brigade10WP and Danitol 2.4EC, which were registered for use on strawberries to control spittlebugs, tarnished plant bugs, and other insects. No growers reported using Brigade10WP or Danitol in 1999-2000 (3).

## **Diseases**

The most common strawberry diseases include Fruit Rot, Black Root Rot, Red Stele, Leather Rot, Leaf Spot, and Leaf Scorch. Phomopsis Soft Rot also was reported by one strawberry producer in West Virginia (3).

### **1. Botrytis Fruit Rot (Gray Mold),** caused by the fungus *Botrytis cinerea*

**Damage and life cycle:** The causal fungus can affect petals, flower stalks, fruit caps, and the fruit. The disease is most severe during prolonged rainy and cloudy periods just before or during harvest. Young blossoms are very susceptible to infection. Fruit are more susceptible as they mature. Fruit infections appear as soft, light brown, quickly expanding areas on the berry. If the fruit remains on the plant, the berry dries up (mummifies) and becomes covered with a gray, dusty powder. Infection is most severe in well-protected areas of the plant where the humidity is high and air movement limited. Strawberries resting on the soil or touching another decaying berry or dead leaf are most commonly affected. After

harvest, the mature fruits also are very susceptible to gray mold, especially if damaged (4).

**Chemical Control:** The recommended fungicides include one of the following options(5):

Early bloom through bloom (5-10% bloom until flowers are gone):

\*Benlate 50 WP or Topsin-M 70 WSB: Applied at a rate of 1 lb./A, each

Elevate 50 WG plus Captan 50 WP: Applied at a rate of 1.5 lb./A and 4 lb./A, respectively

Thiram 65 WP: Applied at a rate of 4 lb./A

Captan 50 WP (alone): Applied at a rate of 6 lb./A

Thiram 65 WP (alone): Applied at a rate of 5 lb./A

Note: Neither Benlate, Elevate, nor Topsin-M should be used alone for season-long control of Botrytis because of the potential for pathogen strains to develop resistance.

\* Benlate cannot be used on strawberries once the crop has been turned into "U-Pick."

Post bloom to harvest (Every seven to 10 days as needed): Recommended fungicides are the same as early bloom through bloom.

Note: The maximum rate of Benlate that can be used after bloom is 8 oz. per acre.

During harvest: Recommendations include the use of :

Topsin M 70 WSB plus (or alternated with) Elevate 50 WG: Applied at a rate of 0.75-1 lb./A, and 1.5 lb./A, respectively; Topsin M has a 1 day PHI and Elevate has a 0 day PHI.

These fungicides should not be used alone in repeated sprays due to the potential for fungicide resistance development.

**Cultural Control:** Management of this disease starts with plant population control. Weeds and excess strawberry plants reduce air circulation and drying, increasing disease risk. A good straw mulch will reduce berry contact with the soil and lessen fruit rot problems. Handle strawberries with care to avoid bruising and refrigerate promptly to limit the spread of gray mold.

## **2. Black root rot, a disease complex**

Damage and life cycle: *Pythium* spp., *Rhizoctonia* spp., and root-lesion nematodes are known to be the causal agents for black root rot disease. The causal agents are found as common inhabitants of most soils (8). Extensive death of feeder rootlets, deterioration and blacking of structural roots, and declining plant vigor and productivity are the main symptoms of black root rot (6). After three to four years of strawberry production, this disease can be commonly reported, especially in heavier or compact soils.

**Chemical Control:** Soil fumigation may be effective.

**Cultural Control:** Control is difficult because the causal organisms persist in the soil for long periods in a dormant stage. Proper site selection, planting on well-drained soils and raised beds are recommended. Crop rotation with sweet corn, sudan, or pumpkins also is recommended (8).

## **3. Red Stele, caused by the fungus *Phytophthora fragariae***

**Damage and life cycle:** The disease is most destructive in heavy clay soils that are saturated with water during cool weather when the fungus is most active. Infected plants have very few new roots; existing roots appear gray. The plant starts to wilt and die. Positive identification of the disease can be made by looking for a pink to brick red color on the central portion of the root (the stele). The red color is best seen in the spring up to the time of fruiting. Diseased plants are stunted, lose their shiny, green luster and produce few runners. Younger leaves often have a metallic bluish-green cast, while the older leaves turn prematurely yellow or red. With the first hot, dry weather, the diseased plants wilt rapidly and die (4).

**Chemical Control:** The fungicides Ridomil and Aliette are labeled for control of Red Stele (5).

Ridomil Gold EC: Applied at 1 pt./A with sufficient water; one application in the spring and the second after harvest in the fall

Aliette: Used as a pre-plant dip to strawberry roots and crowns for 15-30 min;

applied at a rate of 2.5 lb./100 gallons of water

**Cultural Control:** Inspected and certified planting stocks should be selected. Planting on low, wet spots and land with history of red stele infection should be avoided (6). Some strawberry cultivars that showed resistance to several races of the red stele fungus include Allstar, Cavendish, Delite, Earliglow, Guardian, Midway, Redchief, Scott, Sunrise, and Surecrop (5).

#### **4. Leather Rot**, caused by the fungus *Phytophthora cactorum*

**Damage and life cycle:** The fungus can infect strawberries at any time during their development; it causes the most serious problem when it infects the green berries. The infected areas appear dark brown or green and outlined by a brown margin. As the disease spreads, the entire strawberry becomes brown, rough in texture, and leathery in appearance. On ripe fruit, the disease is more difficult to distinguish because the infection causes little color change. These fruits are initially soft to touch but eventually become tough and leathery. Strawberries that have been infected with leather rot also have a distinctive unpleasant odor and bitter taste. Leather rot is most common in poorly-drained areas where there is or has been freestanding water, or the fruit has come in direct contact with the soil (4).

**Chemical Control:** The fungicides Ridomil and Aliette are labeled for control of leather rot (5).

**Ridomil Gold EC:** Applied at 1 pt./A with sufficient water. One application in the spring and the second after harvest in the fall; a supplemental application may be made during the growing season or fruit set.

**Aliette:** Applied as a foliar spray between 10% bloom and early fruit set, and continued on a seven to 14 day interval; applied at a rate of 2.5-5 lb./A

**Cultural Control:** Practices include proper site selection (no standing water), planting on ridges or raised beds, and use of straw mulch to keep fruits from contacting the soil.

#### **5. Leaf Spot**, caused by the fungus *Mycosphaerella fragariae*

**Damage and life cycle:** Leaf spot can infect leaves, petioles, runners, fruit stalks and berry caps. The main symptom of the disease is the appearance of small round spots on the upper surface of the leaf. At first, the spots are dark purple to reddish-purple and range in size from 1/8 to 1/4 inch across; the centers of the spots become tan or gray and , eventually, almost white. Later in the season, tan or bluish areas form on the underside of the leaf. Temperatures between 65 - 75 °F are optimal for infection and disease development. Infection can occur anytime throughout the season, except during dry, hot weather (4).

**Chemical Control:** The recommended fungicides to control leaf spot, leaf scorch, and leaf blight include one of the following options (5):

Early bloom through bloom (5-10% bloom until flowers are gone):

\*Benlate 50 WP or Topsin-M 70 WSB: Applied at a rate of 1 lb./A, each

Elevate 50 WG plus Captan 50 WP: Applied at a rate of 1.5 lb./A and 4 lb./A, respectively

Thiram 65 WP: Applied at a rate of 4 lb./A

Captan 50 WP (alone): Applied at a rate of 6 lb./A

Thiram 65 WP (alone): Applied at a rate of 5 lb./A

\* Benlate cannot be used on strawberries once the crop has been turned into "U-Pick."

Post bloom to harvest (Every seven to 10 days as needed): Recommended fungicides are the same as early bloom through bloom. Note: The maximum rate of Benlate that can be used after bloom is 8 oz. per acre.

Post harvest and new plantings (Every 10 to 14 days as needed): The recommended fungicides to control leaf spot, leaf scorch, and leaf blight include one of the following options:

Captan 50 WP: Applied at a rate of 6 lb./A

Thiram 65 WP: Applied at a rate of 5 lb./A

Benlate 50 WP: Applied at a rate of 1 lb./A

Topsin-M 70 WSB: Applied at a rate of 0.75-1 lb./A

Syllit 65 WP: Applied at a rate of 1.5-2 lb./A

**Cultural Control:** Control for leaf spot is achieved through the use of resistant cultivars, often in combination with a fungicide application program and disease-free nursery stock. June bearing resistant cultivars include Allstar, Canoga, Cardinal, Delite, Honeoye, Jewel, and Tennessee Beauty (5). These cultivars are commonly grown in the Midwest.

## **6. Leaf Scorch**, caused by the fungus *Dicplocarpon earliana*

**Damage and life cycle:** The fungus can infect leaves, petioles, runner, fruit stalks, and berry caps. The symptoms of leaf scorch are similar to the early stages of leaf spot. Infection causes round to angular or irregular, dark-purple spots up to 1/4 inch in diameter on the upper leaf surface. The center of the spots remain dark purple; this distinguishes the disease from leaf spot. When many infections occur on the same leaf, it becomes reddish or light purple. Severely infected leaves dry up and appear scorched. The lesions can girdle the fruit stalk, causing flowers and young fruit to die. The leaf scorch fungus can infect strawberry leaves at all stages of development (4).

**Chemical Control:** See leaf spot.

**Cultural Control:** Frequent renewal of strawberry plantings helps to prevent severe scorch; since the disease often does not become severe during the first and second year after planting. Planting on land with effective air drainage, avoiding application of supplemental nitrogen in spring, and removal of crop residues after picking help in controlling the disease (6). The use of resistant cultivars is an important cultural method to reduce the incidence of disease. June bearing resistant cultivars include Allstar, Canoga, Cardinal, Catskill, Earligrow, Guardian, Honeoye, Jewel, and Sunrise (5). These cultivars are commonly grown in the Midwest.

### **General Disease Management:**

Management of strawberry diseases is especially important in situations where continuous strawberry production is necessary. Damaged, diseased, and overripe fruits should be removed from the fields at regular intervals. A soil disease management program includes several key elements (8):

proper site selection (sandy loam soils preferred) use of resistant cultivars, especially in replant situations soil drainage improvement (tiling, diversions) raised bed cultural systems frequent subsoiling or chisel plowing to break impervious soil layers locating fields away from woodlots or other suitable overwintering sites crop rotations

### **Critically Needed Fungicides:**

Fungicides that play an important role in the (IPM)-resistance management program include Benlate, Captan, Aliete, Ridomil Gold, and Topsin-M. A new fungicide, Elevate 50 WDG, was just labeled for use on strawberries for control of Botrytis gray mold. It represents new chemistry and is very active against Botrytis. Yet, there was no reported case of Elevate use by West Virginia producers (3).

## **Weeds**

Weeds, broadleaf, and grasses are highly competitive with strawberry plants and can reduce yield, interfere with harvest and efficient spray application, and increase the potential for disease and insect problems in the planting. In West Virginia, weed species reported include redroot pigweed, purslane, chickweed, mustard, lambsquarters, sheep sorrel, quackgrass, Canada thistle, and Fall panicum (3).

**Chemical Control:** Recommended herbicides include (5);

Dacthal W-75 (DCPA 75% a.i): Applied at a rate of 8-12 lb./A based on soil organic matter contents

Devrinol 50 DF (napropamide 50% a.i): Applied at a rate of 8 lb. in at least 20 gal. water per acre

Sinbar (terbacil 80% a.i): Applied to established strawberries at least six months in the matted row system at a rate of 2 to 6 oz. of product per acre

Formula 40 (2,4-D triisopropanolamine salt plus 2,4-D dimehtylamine salt):

Applied on established or old plantings at a rate of 1 to 1.5 qt. in 25 to 50 gallons of water per acre in early spring or immediately after last picking

Poast EC (sethoxydim 1.5 lb. ai/gal.): Applied at rate of 1-1.5 pt. plus 2 pt. of crop oil concentrate in 25 gal. water per acre.

\*Gramaxone Extra (paraquat 2.5 lb./gal.): Applied as a direct spray to row middles, using shields to protect strawberry plants at 1.5 pt./A in 20 to 100 gal. water

\* Restricted use pesticide

**Cultural Control:** Effective weed management involves proper field selection, crop rotation, hand weeding, mulching, preplant fumigation, sanitation, and herbicide use.

### **Critically needed herbicides:**

Herbicides that are essential to strawberry production in West Virginia include:

Dacthal: An important herbicide because it can be used for weed control immediately after planting strawberries and because it controls certain grasses and broadleaf weeds from seed

Devrinol: Highly effective in controlling annual grasses and certain broadleaf weeds and does not injure the strawberry plants

Sinbar: Controls annual broadleaf weeds and grasses from seed and seedlings of certain annual and perennial weeds

Formula 40 (2,4-D): The only herbicide available to strawberry growers that is effective in controlling established perennial broadleaf weeds

Poast: Provides good control of grasses, but should not be applied soon after Sinbar.

Gramoxone Extra: Mainly used as a spot spray to control emerged annual weeds

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Survey questionnaires were sent to 65 strawberry producers in West Virginia. Survey responses were received from 13 producers. Results were summarized and reported accordingly

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