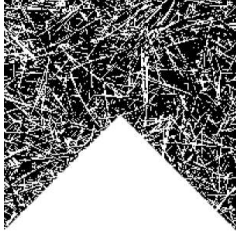


IPM



Small Fruits

Insect, Disease, and Weed Control Recommendations
for 2011

INSECT AND DISEASE CONTROL

Current insect and disease control recommendations for commercial small fruit production in Alabama can be found on the IPM/Production Guides page of the southern region small fruit consortium website: <http://www.smallfruits.org/SmallFruitsRegGuide/index.htm>

Here you can view and download integrated management guides for blueberries, brambles (blackberries and raspberries), bunch grapes, muscadine grapes, and strawberries. Copies of the guides are available through your county Extension office.

The integrated management guides contain the latest recommendations for insecticides, fungicides, nematicides, and herbicides for commercial small fruit production. The guides are a collaborative effort by Extension specialists and researchers from land grant institutions in the southeastern United States.

Small Fruits: Insect and Disease Control section prepared by Robert Boozer, *Area Extension Research Horticulturist*, Alabama Cooperative Extension System, Alabama A&M University and Auburn University; and Edward J. Sikora, *Extension Plant Pathologist*, Professor, Entomology and Plant Pathology, Auburn University.

2011 IPM-0478

WEED CONTROL

Controlling weeds with herbicides in the row of fruit crops is a sound production and harvesting practice. Herbicides should generally be applied in 20 to 40 gallons of water per acre. Where the weeds are short (4 inches tall or less), 15 to 20 gallons per acre will provide adequate coverage. However, taller weeds require a higher volume of spray mix per acre.

Operate the herbicide sprayer in a pressure range of 20 to 40 psi. If operated at higher pressures, drift becomes a problem and can lead to damage. Another important factor is the height of the boom above the ground. To get properly designed overlap, the height should be 18 inches for 80-degree series

nozzles. The following information can help you set up your sprayer correctly:

At 30 psi and 4 mph, a Spraying Systems Teejet 8004 nozzle will deliver 26 gallons per acre. At the same pressure and speed, an 8005 nozzle will deliver 32 gallons per acre; 8006, 39 gallons per acre; 8008, 52 gallons per acre.

To help you calibrate your herbicide sprayer, see Extension Circular ANR-570, "Equipment and Calibration For Low-Pressure Ground Sprayers."

GRAPES

The herbicides listed in the following table are all labeled for use on grapes. They will control a number of problem weeds but not all of them. Some perennial weeds, such as nutsedge and briars, will not be controlled by any of these products. Generally, the low rate given should be used on

coarse-textured soils with low organic matter, and the high rate should be used on heavy clay soils. Always read the herbicide label before using to determine the appropriate rate and observe all use precautions. Rates given are based on a treated-acre basis, not on a planted-acre basis.

Table 1. Small Fruits Weed Control

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
GRAPES		
Preemergence		
CASORON 4G (100-150 lb.)	dichlobenil (4-6 lb.)	May be used on bearing and non-bearing vines. DO NOT apply until 6 months after transplanting. Controls annual grasses, broadleaf weeds, and some perennials. Apply in late winter before the weeds emerge. Rainfall or sprinkler irrigation after application is needed to activate the herbicide. DO NOT allow animals to graze on treated areas. *MOA=Cellulose inhibitor
CHATEAU 51WDG (6-12 oz.)	flumioxazin (0.19-0.38 lb.)	Provides residual control of several annual weeds. Apply before bloom to vines established more than 2 years. Keep spray off vines. May be mixed with foliar herbicides like glyphosate, paraquat, or Rely. DO NOT use more than 6 ounces on sandy loam or other soils having more than 80 percent sand. DO NOT apply within 60 days of harvest. MOA=PPO inhibitor
GOAL 2XL (2-8 pt.) (Generic forms)	oxyfluorfen (0.5-2 lb.)	Apply ONLY under dormant vines before budswell for control of broadleaf weeds. Higher rates provide residual control. May be mixed with Gramoxone, Roundup, Devrinol, diuron, simazine, etc. MOA=PPO inhibitor

*MOA=Mechanism of action. Herbicides with different MOAs should be used in weed resistance management programs. See Table 3 for classifications of mechanisms of action.

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
GRAPES (cont.)		
Preemergence (cont.)		
KARMEX 80DF (2-3 lb.) or DIREX 4L (1.5-2.5 qt.)	diuron (1.6-2.4 lb.)	Apply ONLY to established vineyards that have completed three growing seasons. DO NOT apply to vines with trunks less than 1.5 inches in diameter because injury may result. Injury may occur if heavy rains follow treatment. Controls annual broadleaf weeds and grasses. DO NOT allow animals to graze treated areas. MOA–Photosystem II inhibitor
PRINCEP 90DF or SIMAZINE 90DF (2.2-5.3 lb.) or PRINCEP 4L or SIMAZINE 4L (2-4.8 qt.)	simazine (2-4.8 lb.)	Apply ONLY to established vineyards that have completed three growing seasons. Controls annual broadleaf weeds and grasses. Use the low rate on coarse-textured soils and higher rate on fine-textured soils. DO NOT apply to sandy or gravelly soils. Apply any time between harvest and early spring. DO NOT allow animals to graze treated areas. Requires rainfall or sprinkler irrigation for activation. MOA–Photosystem II inhibitor
PROWL 3.3E (2.4-4.8 qt.) or PROWL H ₂ O (2-4 qt.)	pendimethalin (2-4 lb.)	Apply only to NON-BEARING vineyards. DO NOT apply to new plantings until the soil has settled around each vine. Apply to a weed-free soil surface because emerged weeds are not controlled. Rainfall or irrigation is needed for herbicide activation. Use the low rate for 2- to 4-month weed control and the high rate for 6- to 8-month control. MOA–Mitosis inhibitor
SOLICAM 80DF (1.25-5 lb.)	norflurazon (1-4 lb.)	Apply to bearing or non-bearing vines that have been established in the field for at least 2 years . Apply as a directed spray on sandy loam or finer soil types from fall to early spring. Make only one application per year. DO NOT apply to sands, loamy sands, or gravelly textured soils. DO NOT graze treated areas. Solicam requires rainfall or sprinkler irrigation for activation. MOA–Carotenoid biosynthesis inhibitor
SURFLAN 4AS (2-6 qt.)	oryzalin (2-6 lb.)	Apply to bearing and non-bearing vineyards. May be applied after the soil has settled around new plantings. Controls many annual grasses and small-seeded broadleaf weeds. It will not control emerged weeds. Use low rate for 2- to 4-month weed control and high rate for 8- to 12-month control. Rainfall or irrigation is necessary for herbicide activation. DO NOT graze treated areas. MOA–Mitosis inhibitor
Postemergence		
AIM 2EC (1-2 oz.) + Crop Oil Concentrate (2 pt.)	carfentrazone (0.016-0.031 lb.)	Provides foliar control of several annual broadleaf weeds. Apply so as to keep spray off all green stems, leaves, and fruit. May be mixed with other herbicides to increase control. See label. DO NOT apply within 3 days of harvest or in newly planted vines. MOA–PPO inhibitor

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
GRAPES (cont.)		
Postemergence (cont.)		
FUSILADE DX (0.75 pt.) + Crop Oil Concentrate (2 pt.) or Non-ionic Surfactant (0.5 pt.)	fluazifop-butyl (0.2 lb.) + crop oil concentrate or non-ionic surfactant	Apply only to NON-BEARING vines that will not be harvested within 1 year after application. Apply as a directed spray using 15 to 20 gallons of spray solution per acre with a spray pressure of at least 30 psi. Use higher volumes with dense grass growth. A nonphytotoxic crop oil concentrate or non-ionic surfactant must be used with this herbicide. Use a crop oil concentrate with Fusilade to control perennial grasses, such as bermudagrass and johnsongrass. Repeat application may be needed if regrowth occurs. Will not control broadleaf weeds and nutsedges (nutgrass). MOA–ACCcase inhibitor
GRAMOXONE INTEON (2-4 pt.) or FIRESTORM (0.6-2.5 pt.) + Non-ionic Surfactant	paraquat (0.5-1 lb.) + non-ionic surfactant	Controls most annual broadleaf weeds and grasses and top-kills perennials. Apply as a coarse directed spray in 20 to 50 gallons of water per acre. Add 0.5 to 1 pint non-ionic surfactant per 100 gallons of final spray solution. DO NOT allow spray to contact green stems, fruit, or foliage. DO NOT spray under windy conditions. Use a shield for young vines. DO NOT allow animals to graze on treated areas. Gramoxone Extra is a RESTRICTED USE pesticide. MOA–Photosystem I inhibitor
POAST 1.5E (1.5-2.5 pt.) + Crop Oil Concentrate (2 pt.)	sethoxydim (0.25-0.5 lb.) + crop oil concentrate	Apply as a directed spray in 10 to 20 gallons of spray solution per acre. For perennial grass control, make two applications 2 to 3 weeks apart using the lower rate each time. Will not control broadleaf weeds and nutsedge. DO NOT apply within 50 days of harvest. MOA–ACCcase inhibitor
RELY 200 (1.8-3 qt.)	glufosinate (0.75-1.25 lb.)	Apply as a directed spray under vines for control of emerged weeds. DO NOT use within 1 year of transplanting. DO NOT allow spray to contact green stems or foliage. MOA–Glutamine synthetase inhibitor
SELECT (6-8 oz.)	clethodin (0.095-0.125 lb.)	Apply to NON-BEARING vines that will not be harvested within 1 year of application. Controls annual and perennial grasses. Add non-ionic surfactant at 2 pints per 100 gallons spray mix. MOA–ACCcase inhibitor
ROUNDUP or TOUCHDOWN or GLYPHOSATE (Generic forms)	glyphosate (0.75-4 lb.)	DO NOT allow spray to mist or contact green foliage, green bark, suckers, or vines. Use in plantings that have completed three or more growing seasons. Green suckers should be removed before or shielded during application. Controls a broad spectrum of annual and perennial grasses and weeds. Apply in established vineyards or use for site preparation prior to the transplanting of new vines. See label for specific rates. If the formulation used does not contain an adjuvant, then add a high quality non-ionic surfactant (greater than 80 percent active ingredient) at the rate of 1 pint per 25 gallons of spray mix. MOA–EPSP inhibitor

Chemical Weed Control Program For Grapes

The following is an example of a chemical weed control program for first- through fourth-year vineyards, assuming a mixed population of grasses and broadleaf weeds.

First Year—year of planting

1. Prowl or Surflan after soil has settled.
2. Gramoxone directed during summer for emerged weeds.
3. Poast or Fusilade for perennial grasses as needed.
4. Chateau preemergence in the fall.

Second Year

1. Casoron in January or February.
2. Prowl or Surflan in February or March.
3. Gramoxone or Rely directed during the summer.
4. Solicam in November.

Third Year

1. Surflan in February or March.
2. Gramoxone or Rely directed during the summer.
3. Chateau in November.

Fourth Year, and years thereafter

1. Surflan in February or March.
2. Simazine or Diuron plus Gramoxone in April.
3. Roundup (glyphosate) or Touchdown directed for perennial weeds (e.g., nutsedge, honeysuckle, etc.) as needed.
4. Solicam in November.

BLUEBERRIES

The herbicides listed in the following table are all labeled for use on blueberries. These herbicides will control a number of problem weeds but not all of them. Some perennial weeds, such as nutsedge and briars, will not be controlled by any of these products. Generally, the low rate given should be used

on coarser textured soils with low organic matter, and the high rate should be used on heavy clay soils.

Always read the herbicide label before use to determine the appropriate rate and observe all use precautions. The rates given are based on a treated acre and not on a planted acre.

Table 1. Small Fruits Weed Control (cont.)

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
BLUEBERRIES		
Preemergence		
CASORON 4G (100-150 lb.)	dichlobenil (4-6 lb.)	Casoron can be used on blueberry plantings that have been established for more than 1 year. Application should be made in January or February when air temperature is 50°F or lower. Following application, the herbicide should be incorporated into the soil or irrigated into the soil with 0.5 to 1 inch of water. This herbicide controls a number of annual grasses and broadleaf weeds. MOA—Cellulose inhibitor
CHATEAU 51WDG (6-12 oz.)	flumioxazin (0.19-0.38)	Apply as a directed spray to the base of the bush. Rainfall or sprinkler irrigation is needed for activation of residual activity. Controls several annual grasses and broadleaf weeds. May add other herbicides to obtain foliar weed control. See label. MOA—PPO inhibitor
DEVRINOL 50DF (8 lb.)	napropamide (4 lb.)	Provides residual control of annual grasses and small-seeded broadleaf weeds. Rainfall or overhead irrigation is needed within 24 hours after application. Apply to base of plant after soil has settled around plant. May be used on first year plantings. MOA—Mitosis inhibitor

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
BLUEBERRIES (cont.)		
Preemergence (cont.)		
PRINCEP 4L or SIMAZINE 4L (2-4 qt.) or PRINCEP 90DF or SIMAZINE 90DF (2.2-4.4 lb.)	simazine (2-4 qt.)	Simazine can be used on blueberry plantings that have been established for more than 1 year. This herbicide can be applied in the spring, or a split application can be made in the spring and fall. Simazine controls many annual grasses and broadleaf weeds but will not control established weeds. MOA–Photosystem II inhibitor
SINBAR 80WP (0.5-2 lb.)	terbacil (0.4-1.6 lb.)	Treat only plantings established for 1 year or more. Use in spring or after harvest either before weeds emerge or shortly after. DO NOT use on sandy soils with less than 3 percent organic matter. MOA–Photosystem II inhibitor
SINBAR WP (0.5-3 lb.)	terbacil (0.4-2.4 lb.)	Use ONLY under bushes established for 1 year or more. Make a single application in the spring or after harvest in the fall. DO NOT use on sands or loamy sands. Controls several annual broadleaf weeds and grasses.
SOLICAM 80DF (1.25-5 lb.)	norflurazon (1-4 lb.)	Apply to bearing or non-bearing plantings that are 6 months old or older. Apply as a directed spray on sandy loams or soils having a finer texture from fall to early spring. Make only one application per year. DO NOT apply to sands, loamy sands, or gravelly textured soils. DO NOT graze treated areas. MOA–Carotenoid biosynthesis inhibitor
SURFLAN 4AS (2-6 qt.)	oryzalin (2-6 lb.)	Surflan can be used on new and established plantings of all ages. DO NOT apply on new plantings until the soil has settled and there are no cracks present. Surflan should be applied to a weed-free soil surface and activated by rainfall or irrigation within 21 days. This herbicide controls many annual grasses and some small-seeded broadleaf weeds. DO NOT graze treated areas. DO NOT apply to lowbush blueberries. MOA–Mitosis inhibitor
VELPAR (1.3-2.6 lb.)	hexazinone (1-2 lb.)	Apply as a directed spray to soil and weeds before blueberry leaf emergence in plantings established for 3 years or more. DO NOT apply within 90 days of harvesting highbush or within 450 days of harvesting lowbush blueberries. Read label regarding clones. MOA–Photosystem II inhibitor
Postemergence		
FUSILADE DX (0.75 pt.) + Crop Oil Concentrate (2 pt.) or Non-ionic Surfactant (0.5 pt.)	fluazifop-butyl (0.2 lb.) + crop oil concentrate or non-ionic surfactant	Fusilade is labeled for use on NON-BEARING plants that will not produce fruit within 1 year from the time of application. Make application as a directed spray to prevent contact with the foliage. Use a non-ionic surfactant with at least 75-percent active ingredient at the rate of 0.5 pint per acre. Use 15 to 20 gallons of water per acre with a spray pressure of 30 to 60 psi. Two applications may be needed for the control of large grasses. For control of perennial grasses such as bermudagrass and johnsongrass, see product label. This herbicide will not control broadleaf weeds or nutsedge (nutgrass). DO NOT mix this herbicide with any other herbicide or pesticide. MOA–ACCase inhibitor

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
BLUEBERRIES (cont.)		
Postemergence (cont.)		
GRAMOXONE INTEON (2-4 pt.) or FIRESTORM (0.6-2.5 pt.) + Non-ionic Surfactant	paraquat (0.25-1 lb.) + non-ionic surfactant	Gramoxone is cleared for use on bearing and non-bearing plantings. Generally, it is best to use this herbicide after the first growing season unless the plants are protected from the spray. Apply as a coarse directed spray to thoroughly wet weeds at the base of the blueberries. Use a non-ionic surfactant at 8 to 16 ounces per 100 gallons of spray solution. Apply before emergence of new canes or shoots; otherwise, injury can result. This herbicide will control many small emerged annual weeds and will suppress the growth of some perennial weeds. Gramoxone is a RESTRICTED USE pesticide. MOA–Photosystem I inhibitor
KERB 50W (2-4 lb.)	pronamide (1-2 lb.)	Apply as a directed spray in established blueberries only for control of small emerged winter weeds and grasses. Apply in late fall or winter when soil temperature is 55°F or lower. Also provide residual control. MOA–Mitosis inhibitor
POAST 1.5E (1.5-2.5 pt.) + Crop Oil Concentrate (2 pt.)	sethoxydim (0.25-0.5 lb.) + crop oil concentrate	Apply as a directed spray in a maximum of 20 gallons of spray solution per acre. For bermudagrass control, make two applications 2 to 3 weeks apart using the lower rate each time. Broadleaf weeds and nutsedge (nutgrass) will not be controlled. DO NOT apply within 30 days of harvest. MOA–ACCase inhibitor
RELY 200 (1.8-3 qt.)	glufosinate (0.75-1.25 lb.)	Provides foliar control of several annual broadleaf weeds and grasses. DO NOT allow spray drift to contact green stems or foliage. DO NOT apply within 14 days of harvest. MOA–Glutamine synthetase inhibitor
ROUNDUP or TOUCHDOWN or GLYPHOSATE (Generic forms)	glyphosate (1-4 lb.)	DO NOT allow spray to contact green foliage, stems, or suckers. Provides postemergence control of a wide variety of broadleaf weeds and annual grasses. DO NOT apply within 14 days of harvest. If the formulation used does not contain an adjuvant, then add a high quality non-ionic surfactant (greater than 80 percent active ingredient) at the rate of 1 pint per 25 gallons of spray mix. MOA–EPSP inhibitor

BLACKBERRIES

The herbicides listed in the following table are all labeled for use on blackberries. These herbicides will control a number of problem weeds but not all of them. Some perennial weeds, such as nutsedge and briars, will not be controlled by any of these products. Generally, the low rate given should be used

on coarser textured soils with low organic matter, and the high rate should be used on heavy clay soils.

Always read the herbicide label before use to determine the appropriate rate and observe all use precautions. The rates given are based on a treated acre and not on a planted acre.

Table 1. Small Fruits Weed Control (cont.)

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
BLACKBERRIES		
Preemergence		
CASORON 4G (100 lb.)	dichlobenil (4 lb.)	Use ONLY on plantings established for 6 months or more and DO NOT apply within 1 month of harvest. Controls annual grasses, broadleaf weeds, and some perennials. Apply from late fall to late winter when temperatures are below 50°F. Rainfall or sprinkler irrigation is needed after application for herbicide activation. DO NOT graze treated areas. DO NOT apply during new shoot emergence. MOA–Cellulose inhibitor
DEVRIKOL 50DF (8 lb.)	napropamide (4 lb.)	Provides preemergence control of annual grasses and small-seeded broadleaf weeds such as pigweed. Rainfall or overhead irrigation is needed within 24 hours for activation. Will not control emerged weeds. Apply as directed spray to the base of the crop stalk. MOA–Mitosis inhibitor
PRINCEP 4L or SIMAZINE 4L (2-4 qt.) or PRINCEP 90DF or SIMAZINE 90DF (2.2-4.4 lb.)	simazine (2-4 lb.)	Apply to established plantings in the spring and/or fall. On container plantings less than 6 months old, one-half of the low rate may be used. Use lower rate on light soils. DO NOT apply when fruit is present because illegal residues may result. DO NOT apply more than 4 quarts or 5 pounds per acre during any one growing season. Controls annual grasses and broadleaf weeds. MOA–Photosystem II inhibitor
SINBAR 80WP (0.5-2 lb.)	terbacil (0.4-1.6 lb.)	Treat only plantings established for 1 year or more. Use in spring or after harvest either before weeds emerge or shortly after. DO NOT use on sandy soils with less than 3 percent organic matter. DO NOT apply within 70 days of harvest. MOA–Photosystem II inhibitor
SOLICAM DF (2.5-5 lb.)	norflurazon (2-4 lb.)	Apply from fall to early spring before weeds emerge. Apply when the crop is dormant. The soil must be free of weeds at the time of application since emerged weeds are not controlled. Make ONLY one application per year. Use of Solicam may result in temporary bleaching of the leaves, but the plant will recover. Use lower rate on light soils. DO NOT graze treated areas. MOA–Carotenoid biosynthesis inhibitor

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
BLACKBERRIES (cont.)		
Preemergence (cont.)		
SURFLAN 4AS (2-6 qt.)	oryzalin (2-6 lb.)	Surflan can be used on new and established plantings of all ages. Surflan controls many annual grasses and small-seeded broadleaf weeds. Rainfall or irrigation is necessary for herbicide activation. Use the low rate for 2- to 4-month weed control and the high rate for 8- to 12-month control. Apply in 20 to 40 gallons of water per treated acre. Will not control emerged weeds. DO NOT graze treated areas. MOA–Mitosis inhibitor
Postemergence		
AIM 2EC (0.5-6.4 fl.oz.) + Crop Oil Concentrate	carfentrazone (0.008-0.1 lb.) + crop oil concentrate	Apply as a directed spray for control of several annual broadleaf weeds. Add 1 gallon crop oil concentrate per 100 gallons of spray mix. MOA–PPO inhibitor
FUSILADE DX (0.75 pt.) + Non-ionic Surfactant or Crop Oil Concentrate (2 pt./50 gal. spray mix)	fluazifop-butyl (0.2 lb.) + non-ionic surfactant or crop oil concentrate	Apply to NON-BEARING plantings that will not be harvested within 1 year of application. Apply as a directed spray in 15 to 20 gallons of water per acre. A non-ionic surfactant at 2 pints per 100 gallons or crop oil concentrate at 4 pints per 100 gallons of final spray solution MUST be used with Fusilade. A repeat application may be needed on perennial grasses. Broadleaf weeds and nutsedge (nutgrass) will not be controlled. MOA–ACCcase inhibitor
GRAMOXONE INTEON (1-4 pt.) or FIRESTORM (0.6-2.5 pt.) + Non-ionic Surfactant	paraquat (0.25-1 lb.) + non-ionic surfactant	Controls many annual grasses and broadleaf weeds and suppresses top growth of perennial weeds. Apply as a coarse directed spray in 20 to 40 gallons of water to thoroughly wet weeds. DO NOT allow spray to contact green stems, foliage, or fruit. Add non-ionic surfactant at 1 pint per 100 gallons of final spray solution. Does not provide residual control. Use lower rate on weeds less than 3 inches tall. DO NOT graze treated areas. Gramoxone is a RESTRICTED USE pesticide. MOA–Photosystem I inhibitor
POAST 1.5 E (1.5+2.5 pt.) + Crop Oil Concentrate (2 pt./acre)	sethoxydim (0.25-0.5 lb.) + crop oil concentrate	Apply as a directed spray in 10 to 20 gallons of spray solution per acre. A crop oil concentrate at 2 pints per acre or 4 pints per 100 gallons spray solution MUST be used with Poast. A repeat application may be needed on perennial grasses. Broadleaf weeds and nutsedge (nutgrass) will not be controlled. DO NOT apply within 45 days of harvest. MOA–ACCcase inhibitor
ROUNDUP or TOUCHDOWN or GLYPHOSATE (Generic forms)	glyphosate (1-4 lb.)	DO NOT allow spray to contact green foliage, stems, or suckers. Provides postemergence control of a wide variety of broadleaf weeds and annual grasses. Add non-ionic surfactant at 2 pints per 50 gallons of spray solution. DO NOT apply within 14 days of harvest. If the formulation used does not contain an adjuvant, then add a high quality non-ionic surfactant (>80 percent active) at the rate of 1 pint per 25 gallons of spray mix. MOA–EPSP synthase inhibitor

NOTE: Postemergence applications may be omitted if deemed unnecessary.

Chemical Weed Control Program for Blueberries and Blackberries

The following is an example of a chemical weed control program for first- through third-year blueberry and blackberry plantings, assuming a mixed population of grasses and broadleaf weeds.

First Year—year of planting

1. Surflan after the soil has settled.
2. Poast or Fusilade for perennial grasses as needed.
3. Gramoxone applied with a shielded sprayer during the summer for emerged weeds.
4. Solicam in November.

Second Year

1. Surflan or Devrinol in March.
2. Simazine plus Gramoxone in April.

3. Gramoxone directed as needed during the summer.
4. Solicam in November.

Third Year, and years thereafter

1. Casoron in January.
2. Surflan or Devrinol in March.
3. Simazine plus Gramoxone Extra in April.
4. Glyphosate as needed during the summer.
5. Solicam in November.

STRAWBERRIES

Several different cultural systems are used in the Southeast for strawberry production. In Alabama, some strawberries are grown in a 3-year cycle using a matted-row system of culture. The first year is spent establishing a good population of plants with berry harvesting occurring in the second and third growing seasons.

Good weed control in strawberries grown in matted rows is difficult; however, the program in the following table should make the task easier. Any step in this program may be omitted

when weeds are not present at the suggested time of treatment. In fields where irrigation is not practiced, weed control may be inconsistent. Also, weeds should be present before applications of 2,4-D are made.

Another cultural system for growing strawberries is the annual hill plasticulture system. This is a system where strawberries are planted annually on a raised bed covered with black plastic. See Extension Circular ANR-633, "Commercial Strawberry Production," for more information.

Table 2. Strawberry Weed Control

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Matted Row During Year of Establishment (First Growing Season)		
STEP 1:		
DACTHAL W-75 (12 lb.) or DACTHAL FLOWABLE (6-14 pt.) or DEVRIINOL 2E (8 qt.)	DCPA (9 lb.) napropamide (4 lb.)	Plant strawberries into a well-prepared field free of nutsedge, johnsongrass, bermudagrass, and other perennial weeds. See Circular ANR-633, "Commercial Strawberry Production." Multiple applications of non-selective, non-residual herbicides such as Roundup or Touchdown interspersed with tillage can reduce weed pressure if initiated several months prior to planting. Apply Dacthal or Devrinol after transplanting to a clean seedbed. Overhead irrigation or rainfall is required for activation within 24 hours after applying Devrinol. These herbicides control annual grasses and small-seeded broadleaf weeds. MOA—Mitosis inhibitor
STEP 2:		
POAST 1.5E (1-2.5 pt.) or SELECT 2EC (6-8 oz.) + Crop Oil Concentrate (2 pt.)	sethoxydim (0.2-0.5 lb.) clethodim (0.1 - 0.125 lb.) + crop oil concentrate	Apply as an over-the-top spray to control any actively growing grasses. Add 2 pints of crop oil concentrate per acre and apply in a spray volume of 10 to 20 gallons per acre. DO NOT apply within 7 days of harvest. Thoroughly clean spray tank before using Poast. MOA—ACCcase inhibitor Apply postemergence for control of emerging annual and perennial grasses. Will not control broadleaf weeds or nutsedge. DO NOT apply within 5 days of harvest. MOA—ACCcase inhibitor
CHATEAU 51WDG (3 oz.)	flumioxazin (0.09 lb.)	Apply as a hooded or shielded spray in row middles only. Provides soil residual control of several annual grasses and broadleaf weeds. DO NOT apply after fruit set. MOA—PPO inhibitor

Herbicide Trade Name (Rate/Acre Broadcast)	Herbicide Common Name (Active Herbicide/Acre)	Comments
Matted Row During Year of Establishment (First Growing Season) (cont.)		
STEP 3: See Comments.		Mechanically remove or hand-pull weeds from the rows in late June. Cultivate the middles with flat sweeps run shallowly or use a directed application of Gramoxone in the middles with a shielded sprayer. See below for rates and instructions.
GRAMOXONE INTEON (2-4 pt.) + Non-ionic Surfactant	paraquat (0.5-1 lb.) + non-ionic surfactant	Apply as a postemergence hooded spray in row middles for control of emerged annual broadleaf weeds and annual grasses during the year of crop establishment. Apply in 20 to 40 gallons of spray mix per acre using shields to prevent spray contact with crop plants. Add a non-ionic surfactant at 0.5 to 1 pint per 50 gallons of spray solution. Does not provide residual activity. DO NOT make more than three applications per crop season. DO NOT apply within 21 days of harvest. Gramoxone is a RESTRICTED USE pesticide. MOA–Photosystem I inhibitor
STEP 4: See Comments.		Apply Aim to row middles in July or August.
AIM 2EC (0.5-1.6 fl.oz.)	carfentrazone (0.008-0.025 lb.)	Apply in row middles using a hooded sprayer to prevent contact with the crop. Add a non-ionic surfactant at 2 pints per 100 gallons of spray mix. Controls several annual broadleaf weeds. MOA–PPO inhibitor
STEP 5: 2,4-D AMINE (several formulations)	2,4-D (0.5-0.025 lb.)	Apply in late winter for control of existing broadleaf weeds. Use the lower rate on small weeds to minimize crop injury. Some crop injury may occur but strawberry plants will recover. Apply 2,4-D as a spot treatment to minimize crop injury. MOA–Synthetic auxin
For Established Beds (Second and Third Growing Seasons)		
The weed control program for established strawberry beds is outlined below. Herbicide rates to use are given in the table above. After strawberry harvest during the third growing season, many strawberry producers destroy existing plants		and establish new beds during late fall or winter. If the existing strawberry beds are to be carried into the fourth growing season, follow the remainder of the program listed in the outline.
Three-Year Herbicide Program (Matted Row)		
First Growing Season—Year Of Establishment		
January or February	Plant strawberries; apply Dacthal or Devrinol	
March	Apply Poast or Select	
Late June	Cultivate or apply Gramoxone or Aim in hooded sprayer	
July	Cultivate or apply Gramoxone or Aim in hooded sprayer	
September	Hand-weed rows	
January or February	Apply 2,4-D Amine** followed by Dacthal or Devrinol	
Second Growing Season		
March to May	Harvest fruit	
June	Renovate or cultivate	
July	Apply Poast or Select	
August	Cultivate or apply Gramoxone or Aim in hooded sprayer	
January	Apply 2,4-D Amine** followed by Dacthal or Devrinol	
Third Growing Season		
March to May	Harvest fruit	
June	Renovate or cultivate	
July	Apply Poast or Select	
August	Cultivate or apply Gramoxone or Aim in hooded sprayer	
January	Apply 2,4-D Amine**	

** Use only if necessary.

 Annual Hill Plasticulture

- STEP 1.** If possible, select an area that is free of perennial weeds, such as nutsedge, trumpetcreeper, or dewberry.
- STEP 2.** Follow procedures for fumigation and planting as described in Circular ANR-633.
- STEP 3.** Weed control in the middles can be accomplished using the herbicides listed in the matted row section. Weed control over the plastic will be limited if weeds emerge through planting holes in the plastic. Poast can be used to control grasses. Broadleaf weeds such as vetch and Carolina geranium can be controlled with 2,4-D, but strawberry varieties differ in their tolerance to this herbicide. Hand weeding may be required.
-

Table 3. Herbicide Classified by Mechanism of Action

Mechanism of Action	Herbicide
Acetyl CoA Carboxylase (ACCase) inhibitor	Poast, Select, Fusilade
Carotenoid biosynthesis inhibitor	Solicam
Cellulose inhibitor	Casoron
Enolpyruval shikimate-3-phosphate (EPSP) inhibitor	Roundup, Touchdown, etc.
Glutamine synthetase inhibitor	Rely
Mitosis inhibitor	Devrinol, Surflan, Kerb
Photosystem I inhibitor	Gramoxone, Firestorm
Photosystem II inhibitor	Princep, Karmex/Direx, Velpar
Protoporphyrinogen oxidase (PPO) inhibitor	Chateau, Goal, Aim
Synthetic auxin	2,4-D

Table 4. Estimated Effectiveness of Recommended Herbicide Treatments on Important Weeds Infesting Small Fruits in Alabama and Properties That May Affect Water Quality¹

WEEDS	HERBICIDES							
	Casoron (PRE)	Chateau (PRE)	Dacthal, Devrinol (PRE)	Goal (PRE)	Karmex (PRE)	Princep (PRE)	Prowl, Surflan (PRE)	Sinbar (PRE)
GRASSES								
Bermudagrass	0	1	1	0	1	0	1	2
Crabgrass	7	6	7	0	8	8	9	8
Fall Panicum	5	6	7	0	7	7	8	7
Goosegrass	5	4	6	0	8	8	8	2
Johnsongrass (rhizome)	--	1	1	0	1	0	1	2
Johnsongrass (seedling)	--	6	7	0	5	3	8	8
Nutsedge	0	0	1	0	0	0	0	4
Texas Panicum	--	4	5	0	4	3	6	6
BROADLEAVES								
Cocklebur	--	1	2	7	7	7	0	3
Florida Pusley	8	8	4	3	8	9	8	8
Lambsquarter	8	9	8	8	9	9	7	9
Morningglory	--	8	3	9	6	7	0	3
Pigweed	8	9	8	9	9	9	9	2
Prickly Sida	7	9	2	8	7	9	0	2
Ragweed	7	8	6	4	8	8	--	8
Sicklepod	--	1	1	5	8	7	0	3
Spotted Spurge	7	9	5	8	6	9	0	3
Surface-Loss Potential²	M	M	M	M	M	M	S	--
Leaching Potential³	M	L	M	M	M	M	S	--

continued

¹ Ratings are based on observations of research plots and field use under average weather conditions for several years by weed control workers in Alabama and the South. Leaching and surface-loss potential ratings are based in part on herbicide chemical characteristics and pesticide behavior models developed by USDA scientists as well as on field experience.

² The surface-loss potential indicates the tendency of the pesticide to move with sediment in runoff.

³ The leaching potential indicates the tendency of the pesticide to move in solution with water and to leach below the root zone.

KEY TO CONTROL RATINGS AND ABBREVIATIONS

Ratings scale: 0 = No control; 10 = 100% control; -- = Information not available.

PPI = Preplant Incorporated; PRE = Preemergence. S = Small; M = Medium; L = Large.

Table 4. Estimated Effectiveness of Recommended Herbicide Treatments on Important Weeds Infesting Small Fruits in Alabama and Properties That May Affect Water Quality¹ (cont.)

WEEDS	HERBICIDES								
	Solicam (PRE)	Velpar (PRE)	2,4-D (POST)	Poast (POST)	Select Fusilade (POST)	Gramoxone (PDS)	Rely (PDS)	Roundup, Touchdown (PDS)	Aim (HOOD)
GRASSES									
Bermudagrass	3	5	0	5	7	2	5	7	0
Crabgrass	8	8	0	9	8	6	5	8	0
Fall Panicum	8	7	0	8	8	7	8	8	0
Goosegrass	8	8	0	8	8	8	8	8	0
Johnsongrass (rhizome)	1	2	0	6	8	3	7	8	0
Johnsongrass (seedling)	7	8	0	9	8	8	8	8	0
Nutsedge	5	1	0	0	0	3	4	7	0
Texas Panicum	4	6	0	7	8	9	6	8	0
BROADLEAVES									
Cocklebur	5	4	9	0	0	8	5	8	8
Florida Pusley	8	1	7	0	0	8	5	7	1
Lambsquarter	5	9	8	0	0	7	4	8	8
Morningglory	5	6	9	0	0	9	5	9	9
Pigweed	9	7	8	0	0	9	5	6	8
Prickly Sida	9	3	7	0	0	6	4	8	1
Ragweed	8	3	8	0	0	8	4	8	1
Sicklepod	6	3	9	0	0	9	5	9	0
Spotted Spurge	7	8	7	0	0	7	5	7	1
Surface-Loss Potential²	M	M	M	M	M	S	S	S	S
Leaching Potential³	M	M	S	S	S	S	S	S	S

¹ Ratings are based on observations of research plots and field use under average weather conditions for several years by weed control workers in Alabama and the South. Leaching and surface-loss potential ratings are based in part on herbicide chemical characteristics and pesticide behavior models developed by USDA scientists as well as on field experience.

² The surface-loss potential indicates the tendency of the pesticide to move with sediment in runoff.

³ The leaching potential indicates the tendency of the pesticide to move in solution with water and to leach below the root zone.

KEY TO CONTROL RATINGS AND ABBREVIATIONS

Ratings scale: 0 = No control; 10 = 100% control.

PRE = Preemergence; POST = Postemergence; PDS = Post Directed Spray. S = Small; M = Medium.

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For more information, contact your county Extension office. Visit <http://www.aces.edu/counties> or look in your telephone directory under your county's name to find contact information.

Use pesticides **only** according to the directions on the label. Follow all directions, precautions, and restrictions that are listed. Do not use pesticides on plants that are not listed on the label.

The pesticide rates in this publication are recommended **only** if they are registered with the Environmental Protection Agency or the Alabama Department of Agriculture and Industries. If a registration is changed or canceled, the rate listed here is no longer recommended. Before you apply **any** pesticide, check with your county Extension agent for the latest information.

Trade names are used **only** to give specific information. The Alabama Cooperative Extension System does not endorse or guarantee any product and does not recommend one product instead of another that might be similar.

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