# Southeast Regional Blueberry Integrated Management Guide


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Gerard Krewer (University of Georgia)

**Section Editors**

Pathology; Phil Brannen (University of Georgia)
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Paul Guillebeau (University of Georgia)

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Phil Brannen (University of Georgia)
Powell Smith (Clemson University)

Contributions were also made by Bill Cline (North Carolina State University), Dan Horton (University of Georgia), Allen Straw (University of Tennessee), Scott Nesmith (University of Georgia), John Meyer (North Carolina State University), Oscar Liburd (University of Florida), Mark Czarnota (University of Georgia), Steve Bost (University of Tennessee) and Blair Sampson (USDA/ARS Small Fruit Res. Station, Poplarville, MS).


Recommendations are based on information from the manufacturer's label and performance data from research and extension field tests.

Because environmental conditions and grower application methods vary widely, suggested use does not imply that performance of the pesticide will always conform to the safety and pest control standards indicated by experimental data.

This publication is intended for use only as a guide. Specific rates and applications methods are on the pesticide label, and these are subject to change at any time. Always refer to and read the pesticide label before making any application! The pesticide label supercedes any information contained in this guide, and it is the legal document referenced for application standards.

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# Blueberry Integrated Management Guide (Insect and Disease Control)

## **Dormant** (before flower or leaf buds break)

**Blueberry gall midge –** The blueberry gall midge is a tiny fly. Blueberry gall midge maggots typically feed on vegetative buds. On most varieties, vegetative feeding does little harm. On rabbiteye cultivars, flower feeding strains of blueberry gall midge occur sporadically. If present, gall midges which feed on flower buds constitute a serious threat. Feeding injury destroys flower buds before bud scales open in the spring. Orchard sanitation in the form of a herbicide program to chemically mow the entire orchard floor or light cultivation, as for mummy berry suppression, may offer helpful suppression. Producers are cautioned not to institute pre-bloom insecticide control programs for blueberry gall midge until its presence as a pest has been confirmed on or near your production area. Gall midge lay eggs on warm winter days. **Apply diazinon as-needed for gall midge between flower bud stages 1 and 2, as the most mature buds first show slight separation of scales**. Repeat sprays during warm spells. Separation of bud scales may occur as early as 15 December in south Georgia. Premier is often particularly attractive, and it is a good sentinel variety to monitor. Gall midge applications also provide a helpful degree of pre-bloom thrips suppression.

**Bagworm –** remove and dispose of bagworm cases, some of which contain eggs, prior to April.

**Blueberry bud mite –** The blueberry bud mite is an eriophyid mite, so tiny (1/125 inch long) that it cannot be seen without magnification. Blueberry bud mite is an occasional pest in blueberries in Georgia, but is a common pest on certain cultivars in North Carolina. Injury may be more visible in late spring. **Infested plants are recognized by a clustering or rosetting of buds, which may be abundant. Infested buds become succulent, fleshy, closely packed, form clusters or rosettes on stems, and they may redden**. Bloom on infested plants is reduced. Affected berries are small, roughened and may have small reddish pimples or blisters on the fruit surface. Blueberry bud mite numbers increase during late summer and early fall. Next year's flower and leaf buds are infested. **Sanitation by aggressive, timely pruning of infested branches can be helpful. Mechancial topping (mowing off old fruiting twigs) immediately after harvest greatly reduces bud mite incidence the following year**. Never propagate from bushes that may be infested with blueberry bud mite. **Horticultural oil applications immediately after harvest will aid in control.**

**Mummy berry** – Raking mummified berries to the row middles, followed by deep burial of mummies to a depth of at least one inch, will help to reduce the primary mummy berry inoculum source. This activity needs to be conducted prior to mid-January in the most southern blueberry regions. **Use caution; excessive amounts of dirt mounded on top of blueberry roots and stems can result in injury or plant death.**

**Phytophthora root rot** – Root rot is generally a problem of low, poorly drained sites. Provisions for adequate drainage must be made prior to planting! Site selection and/or proper bedding operations are essential cultural practices for control of this disease. It also is very problematic in pine bark beds for southern highbush varieties. Treatment with fungicides is not effective for reversing root rot damage on plants with severe symptoms. Preventative treatments in pine bark beds may be warranted, since the beds are often saturated with water through either irrigation or rainfall.

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Mummy berry | Rake mummies to row centers and bury 1" deep | | ***** | | | Burying mummies helps to prevent primary infections. However, it is difficult to insure that all mummies will be buried, so chemical control is also necessary. |

# **Blueberry** (continued)

## **Dormant** (continued)

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Phytophthora root rot | fosetyl-Al (Aliette WDG) | 5 lb | +++ | 12 hrs | 0 days | Apply Aliette as a foliar spray. Subsequent applications can be made on 14-21 day intervals. Do not exceed 4 applications per acre per year. |
| | mefenoxam (Ridomil Gold 4EC) | 3.6 pt | ++++ | 48 hrs | 0 days | **Established plantings:** Apply ¼ pt/1000 linear feet of row (3.6 pt/A broadcast basis) in a 3 ft band over the row before the plants start growth in the spring. **New plantings:** Apply 3.6 pt/A (broadcast rate) at or after the time of planting. An 18 in band over the row is recommended. Do not apply more than 0.9 gal/A broadcast during the 12 months before bearing harvestable fruit, or illegal residues may result. For both new and established plantings, one additional application may be made to coincide with periods most favorable for root rot development. |
| Scale | Superior Oil (70 second) | 2 gal/100 gal water/acre<br>or<br>2 fl ozs/1 gal of water | +++++ | 12 hrs | 12 hrs | Oil may be applied dormant or delayed dormant. Apply as needed for scale infestations. Do not apply oil when temperatures are expected to be higher than 85°F or lower than 40°F within 24 hours. Do not use within 14 days of lime-sulfur. |
| Gall midge | diazinon (Diazinon AG500) | 1 pt | +++++ | 24 hrs | 7 days | Diazinon is the material of choice for earlier gall midge sprays. Do not apply diazinon within 5 days of bloom, as its residual may injure pollinators. |
| | spinosad (SpinTor 2SC) | 4-8 oz | +++ | 4 hrs | 3 days | SpinTor is the material of choice near bloom, and should be applied as-needed just before bloom. SpinTor is quite toxic to bees until it is thoroughly dry (3 hrs). |
| | malathion (Malathion 57EC) | 2 pt | ++++ | 12 hrs | 1 day | Malathion may be applied for gall midge at stage one bud development. Do not apply malathion within 24 hours of bloom. |

# **Blueberry** (continued)

## Pre-bloom through green tip (leaf buds) and pink bud (flower buds)

**Mummy berry –** If mummy berry disease becomes established in your planting, fungicides are very important in pre-bloom sprays (for cultivars that show leaf bud break before flower bud break). Start spraying when green tip occurs on the leaf buds or 1-5% open bloom (stage 6) occurs on the flower buds, whichever comes first. Continue sprays till all blooms have fallen. In recent years, most states have obtained Section 18 Emergency Exemptions from the US EPA for the use of Indar (fenbuconazole) to control mummy berry. Check with your county extension office or department of agriculture for information on emergency measures for pest control.

**Flower thrips –** Flower thrips can be very damaging to flower buds and blooms. Thrips numbers typically increase dramatically as corollas open and bloom progresses. Determining when or if blueberries should be treated for thrips is difficult. Treatment thresholds, thrips counts which indicate the need for an insecticide application, do not presently exist. **Blueberries are a pollination sensitive crop, and careless use of insecticides and subsequent bee kill can easily impair pollination and ruin fruitset.** Insecticides should not be applied during bloom. Some very provisional thrips treatment threshold concepts follow.

(1) Begin sampling bloom clusters for thrips at stage 3. Place flower bud clusters in sealed plastic bags and incubate them in a warm room or on a windowsill. Less than 2 thrips per individual bloom during stage 3 is probably insignificant. However, 6 thrips per bloom is almost certain to destroy a flower.

(2) If thrips are found in blooms at stage 3, begin sampling two to three times a week. Take a minimum of five bags of bloom clusters per block each time. If more than 2 thrips per individual bloom are found, and if the numbers are increasing, apply an insecticide. Diazinon is the material of choice until 5 days pre-bloom. From five days pre-bloom until first bloom, the material of choice is SpinTor.

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Mummy berry (shoot blight phase) | pyraclostrobin + boscalid (Pristine WG) | 18.5-23 oz | +++++ | 24 hrs | 0 days | No more than 2 sequential applications of Pristine should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Pristine per acre per crop year. |
| Phomopsis cane and twig blight | pyraclostrobin + boscalid (Pristine WG) | 18.5-23 oz | +++ | 24 hrs | 0 days | No more than 2 sequential applications of Pristine should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Pristine per acre per crop year. |

# **Blueberry** (continued)

## **Pre-bloom through green tip (leaf buds) and pink bud (flower buds)** (continued)

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Gall midge | diazinon (Diazinon AG 500) | 1 pt | +++++ | 24 hrs | 7 days | Do not apply within 5 days of bloom. |
| | spinosad (SpinTor 2SC) | 4-8 oz | +++ | 4 hrs | 3 days | SpinTor may be applied as-needed just before bloom. SpinTor is quite toxic to bees until it is thoroughly dry (3 hrs). |
| | malathion (Malathion 57EC) | 2 pt | ++++ | 12 hrs | 1 day | Malathion may be applied at flower bud stage one. Do not apply malathion within 24 hours of bloom. |

## 10-20% bloom until 80-90% bloom

DO NOT USE INSECTICIDES DURING BLOOM – Spraying with insecticides may kill or repel wild bees, and honey bees are needed for adequate pollination and fruit set.

| | | | | | | |
|---|---|---|---|---|---|---|
| Flower thrips | spinosad (SpinTor 2SC) | 6 oz | ++++ | 4 hrs | 3 days | Insecticide applications during bloom are typically very damaging to pollinators. **Outbreak flower thrips populations may be sprayed as needed at night with minimal risk to bees.** Spray early in the evening to minimize risk. |
| Botrytis flower blight | cyprodinil + fludioxonil (Switch 62.5WG) | 11-14 oz/acre | +++++ | 12 hrs | 0 days | Make the first application during early bloom. Subsequent applications should be made every 7-10 days during bloom. Do not apply more than 56 oz. of product per acre per year. Make no more than two sequential applications before using another fungicide with a different mode of action. |

# **Blueberry** (continued)

## **10-20% bloom until 80-90% bloom** (continued)

**Cranberry fruitworm** – Scout fields for cranberry fruitworm to determine if and when spraying is needed. Check for fruitworm twice a week from full bloom until 4 weeks after petal fall. Examine fruit clusters for tiny pin-sized holes in berries, with frass and premature ripening in more mature fruit. Break berries open to look for larvae and damage. Early varieties such as 'Climax' are normally infested first. Infestations should be caught in the 1st or 2nd berry in a cluster for sprays to give the needed control of this pest.

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Botrytis (continued) | fenhexamid (Elevate 50WDG) | 1.5 lb/acre | +++++ | 12 hrs | 0 days | Begin application at 10% bloom. Applications should be made every seven days when conditions favor disease. Do not make more than two consecutive applications without switching to a fungicide with a different mode of action. Do not apply more than 6.0 lb product per acre per year. |
| | captan + fenhexamid (CaptEvate 68WDG) | 3.5-4.7 lb/acre | +++++ | 72 hrs | 0 days | CaptEvate is a combination product of Captan plus Elevate. Do not make more than two consecutive applications before switching to a fungicide with a different mode of action. Do not apply more than 21.0 lb/acre/season. |
| | pyraclostrobin + boscalid (Pristine WG) | 18.5-23 oz/acre | +++++ | 24 hrs | 0 days | No more than 2 sequential applications of Pristine should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Pristine per acre per crop year. |
| | ziram (Ziram 76DF) | 3 lb | ++ | 48 hrs | ~30 days | Do not apply later than 3 weeks after full bloom. |
| | captan (Captan 50WP) | 5 lb | ++ | 72 hrs | 0 days | Do not apply more than 70 lb per acre per crop year. |
| | captan (Captec 4L) | 2 qt | ++ | 72 hrs | 0 days | Do not apply more than 35 quarts per acre per crop year. |
| Mummy berry (blossom infection stage) | pyraclostrobin + boscalid (Pristine WG) | 18.5-23 oz/acre | +++++ | 24 hrs | 0 days | No more than 2 sequential applications of Pristine should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Pristine per acre per crop year. |

## **Blueberry** (continued)

### **10-20% bloom until 80-90% bloom** (continued)

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Ripe (anthracnose) and/or Alternaria rots | azoxystrobin (Abound) | 6.2-15.4 fl oz | +++++ | 4 hrs | 0 days | Subsequent applications can be made on 7-14 day intervals. Do not apply more than two sequential applications before switching to a fungicide with another mode of action (e.g. Captan). Do not apply more than 1.44 quarts per acre per season. |
| | cyprodinil + fludioxonil (Switch 62.5WG) | 11-14 oz | +++++ | 12 hrs | 0 days | Applications can be made on a 7-10 day interval when conditions warrant. Do not apply more than 56 oz of product per acre per year. Make no more than two sequential applications before using another fungicide with a different mode of action. |
| | pyraclostrobin (Cabrio EG) | 14 oz | ++++ | 24 hrs | 0 days | No more than 2 sequential applications of Cabrio should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Cabrio per acre per crop year. |
| | pyraclostrobin + boscalid (Pristine WG) | 18.5-23 oz | +++++ | 24 hrs | 0 days | No more than 2 sequential applications of Pristine should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Pristine per acre per crop year. |
| | ziram (Ziram 76DF) | 3 lb | ++ | 48 hrs | ~30 days | Do not apply later than 3 weeks after full bloom. |
| | captan (Captan 50WP) | 5 lb | +++ | 72 hrs | 0 days | Do not apply more than 70 lb per acre per crop year. |
| | captan (Captec 4L) | 2 qt | +++ | 72 hrs | 0 days | Do not apply more than 35 quarts per crop year. |

# **Blueberry** (continued)

## Petal fall until one month after bloom

**Cranberry fruitworm, Cherry fruitworm, Plum curculio** – Review field histories and scout fields for fruitworms and plum curculio to determine if and when spraying is needed. Fields with a history of infestation should be sprayed at least twice on a 7-14 day interval, beginning immediately after bloom. Check for fruitworms twice a week from full bloom until 4 weeks after petal fall. Examine fruit clusters for tiny pin-sized holes in berries, with frass and premature ripening in more mature fruit. Break berries open to look for larvae and damage. Early varieties are normally infested first. Control will be best when these insects are sprayed early in the infestation period.

**Septoria and anthracnose leaf spots** – Septoria and anthracnose leaf spot pathogens can cause premature defoliation, resulting in poor bud development and subsequent loss of yield. Fungicide timing for leaf spots varies across the Southeastern region. For example, North Carolina blueberries generally require leaf spot control as soon as green leaves have unfolded (10-14 days after bloom), whereas in Georgia, infections do not occur until mid-May or early June, without regard to the stage of leaf development. Materials applied for rot control will also often have leaf spot activity. Consult with your local county agent for recommendations in your area.

**Blueberry Stunt** – Bushes infected with this disease become visible when leaves mature in May. Stunt is a devastating disease of blueberry in North and South Carolina, and has also been reported from Arkansas. Symptoms include shortened internodes, small, cupped leaves and loss of productivity. Control relies on removal of infected bushes (including roots) and control of the insect vector (the sharpnosed leafhopper) that carries the disease from bush to bush. Stunt is rarely seen on rabbiteye cultivars but is common on highbush and Southern highbush cultivars in southeastern NC.

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Ripe (anthracnose) and/or Alternaria rots | azoxystrobin (Abound) | 6.2-15.4 fl oz | +++++ | 4 hrs | 0 days | Subsequent applications can be made on 7-14 day intervals. Do not apply more than two sequential applications before switching to a fungicide with another mode of action (e.g. Captan). Do not apply more than 1.44 quarts per acre per season. |
| | cyprodinil + fludioxonil (Switch 62.5WG) | 11-14 oz | +++++ | 12 hrs | 0 days | Applications can be made on 7-10 day intervals when conditions warrant. Do not apply more than 56 oz of product per acre per year. Make no more than two sequential applications before using another fungicide with a different mode of action. |
| | pyraclostrobin (Cabrio EG) | 14 oz | ++++ | 24 hrs | 0 days | No more than 2 sequential applications of Cabrio should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Cabrio per acre per crop year. |

## **Blueberry** (continued)

## Petal fall until one month after bloom

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Ripe (anthracnose) and/or Alternaria rots (continued) | pyraclostrobin + boscalid (Pristine WG) | 18.5-23 oz | +++++ | 24 hrs | 0 days | No more than 2 sequential applications of Pristine should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Pristine per acre per crop year. |
| | ziram (Ziram 76DF) | 3 lb | ++ | 48 hrs | ~30 days | Do not apply later than 3 weeks after full bloom. |
| | captan (Captan 50WP) | 5 lb | +++ | 72 hrs | 0 days | Do not apply more than 70 lb per acre per crop year. |
| | captan (Captec 4L) | 2 qt | +++ | 72 hrs | 0 days | Do not apply more than 35 quarts per crop year. |
| Cranberry fruitworm, cherry fruitworm, plum curculio, and sharpnosed leafhopper | malathion (Malathion 57EC) | 2.8-3.2 pt | +++ | 12 hrs | 1 day | Spray fruitworms when 1 bush in 5 has infested fruit clusters. |
| | esfenvalerate (Asana 0.66 EC) | 4.8-9.6 fl oz | ++++ | 12 hrs | 14 days | Some users may be allergic to Asana; discontinue use if skin or eyes become inflamed. |
| | phosmet (Imidan 70WP [24 (c) label for cranberry fruitworm in GA, AR, SC, MS, and AL; for plum curculio in SC and LA]) | 1-1.5 lbs | +++++ | 24 hrs | 3 days | Imidan, applied for blueberry maggot, provides excellent control of fruitworms and plum curculio. |

## **Blueberry** (continued)

## Petal fall until one month after bloom

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Sharpnosed leafhopper (continued) | azinphos-methyl (Guthion 2L) | 2-3 pt | +++++ (for fruitworms) +++++ (for plum curculio) | 48 hrs/ 4 days | 7 days | **Azinphos-methyl is extremely toxic to applicators and field laborers.** REI is 48 hours for mowing, irrigation, and scouting only; four days for all other purposes. Do not make more than three applications per crop season. Allow at least 10 days between applications. Application by backpack or hand wand is prohibited. |
| | carbaryl (Sevin 80WSP) | 1.875-2.5 lb | +++ (for fruitworms) | 12 hrs | 7 days | Sevin is a poor choice if plum curculio is a problem in your area. |
| | tebufenozide (Confirm 2F) | 16 fl oz | +++++ (for fruitworms) | 4 hrs | 14 days | Confirm does not control plum curculio. Confirm needs to be ingested to be effective; therefore, timing is critical. Apply Confirm while fruitworms are still small. Confirm conserves natural enemies. |

## Pre-harvest

**Fire ants –** Fire ants can be very important pests in orchards, vineyards or fields. Ant baits employed in a spring and fall broadcast treatment regime should eliminate most, but seldom all, fire ant mounds within treated areas. Ant baits are slow acting; they are ineffective when employed as curative treatments to 'clean up' active infestations. Worker ants must be attracted to baits, so they can carry back them to their colonies. Ant baits interfere with reproduction, which causes a gradual die-off of colonies. Colony elimination should not be expected until 4 to 8 weeks after application. Extinguish Professional Fire Ant bait (0.5%% methoprene) is labeled for use on all 'crop land' sites. It is effective, but somewhat slower acting than Esteem Ant Bait (0.5% pyriproxyfen) which is labeled in blueberries and figs, but not in other small fruits.

**Optimal control programs for fruit should include spring and fall broadcast applications.** Ant baits work best when soil is moist, but not wet. Active ant foraging is essential. Ideally, temperatures should be warm and sunny. Avoid application of ant baits when conditions are expected to be cold, overcast, rainy or very hot. In the first year of ant control, it may be best to make 2 applications in spring or fall to assure the desired reduction of mounds within plantings. **Individual mound treatments are most effective when used as-needed for the occasional colony that survives broadcast treatments**. Mound treatments should be applied in a circle, 3 to 4 feet from the mound. Do not disturb mounds or place bait directly on top of mounds.

## **Blueberry** (continued)

## **Pre-harvest** (continued)

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Imported fire ants | pyriproxyfen (Esteem Ant Bait) | 1.5-2.0 lbs<br><br>(2-4 tbsp/mound) | ++++ | 12 hrs | 24 hrs | Esteem Ant Bait should be applied during the spring, and if needed, again in the fall. Apply on sunny days when the soil temperature is at least 60 F, and the soil is moist. Baits are slow acting but effective. Allow 4 weeks to work. Do not make other fire ant treatments for 7-10 days. May need to reapply if heavy, flooding rains occur within 7 days. |
| | malathion (Malathion 57EC) | 1 pt | ++ | 12 hrs | 1 day | Malathion is a modestly effective foliar rescue treatment. **May be applied to plants** one day before harvest to discourage ants from foraging on the plants. This is a stopgap treatment to get ants off the plants. Rely on aggressive post-harvest imported fire ant controls to suppress these pests in blueberries. |
| | diazinon. Diazinon AG 500 | 1 pt/100 gal | ++++ | 24 hrs | 7 days | Mound drench. Slowly apply 1 gal of diluted mixture over and 6 inches around each mound. Apply gently to avoid disturbing ants. |
| | methoprene (Extinguish Professional Fire Ant Bait 0.5 %) | 1-1.5 lb<br><br>(3-5 tbsp/ 1000 sq ft)<br><br>(3-5 tbsp/mound) | +++ | 4 hrs | 4 hrs | Extinguish Professional Fire Ant Bait (0.5% methoprene) is legal for use on 'crop land.' **Caution, Extinguish baits with methoprene plus hydramethylnon are not labeled for use on crop land.** Application during the heat of the day or when rain is expected within 6 hours of application will reduce the effectiveness of this product. In areas of heavy infestation, repeat applications may be necessary 10-12 weeks after the initial application. |
| Alternaria and Ripe rots | azoxystrobin (Abound) | 6.2-15.4 fl oz | +++++ | 4 hrs | 0 days | Subsequent applications can be made on 7-14 day intervals. Do not apply more than two sequential applications before switching to a fungicide with another mode of action (i.e. Captan). Do not apply more than 1.44 quarts per acre per season. |

# **Blueberry** (continued)

## **Pre-harvest** (continued)

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Alternaria and Ripe rots (continued) | cyprodinil + fludioxonil (Switch 62.5WG) | 11-14 oz | +++++ | 12 hrs | 0 days | Applications can be made on 7-10 day intervals when conditions warrant. Do not apply more than 56 oz. of product per acre per year. Make no more than two sequential applications before using another fungicide with a different mode of action. |
| | pryraclostrobin (Cabrio EG) | 14 oz | ++++ | 24 hrs | 0 days | No more than 2 sequential applications of Cabrio should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Cabrio per acre per crop year. |
| Alternaria and Ripe rots (continued) | pyraclostrobin + boscalid (Pristine WG) | 18.5-23 oz | +++++ | 24 hrs | 0 days | No more than 2 sequential applications of Pristine should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Pristine per acre per crop year. |

## HARVEST

**Blueberry maggot fly (BBMs) –** BBMs are established in some plantings and are potentially serious mid-and late-season fruit pests. BBMs may go undetected at harvest, so one can easily ship infested fruit. Thorough field-by-field scouting is needed to detect egg-laying adult flies early and minimize loss. Monitor by hanging yellow, sticky traps (baited with ammonium carbonate), at least one per cultivar. Trap catches indicate when adults are present. **Traps should be hung in orchards by mid-May.** See your County Agent for ID pictures and further reference. **If your orchard has been damaged by a BBM infestation before, spray as soon as adults are trapped**. **If your orchard has not been damaged by a BBM infestation before, and adults are trapped, either**: (1) spray immediately, or (2) accept more risk, begin daily examination of fruit for larval infestation, and **spray immediately** if any larval injury is found. Once spraying for BBM begins it is very important to **spray every 7-14 days until all the fruit has been harvested.** Materials and spray intervals are listed below. Growers shipping fruit to Canada must comply with Canadian guidelines for scouting, spraying and post-harvest inspection of berries, including a protocol for cooking samples of harvested fruit to test for the presence of maggot larvae in berries.

**Fruit rots** – Fungicides alone do not provide adequate control; proper harvesting and handling is essential. Pre- and post-harvest rots can be greatly reduced by timely, complete harvest of all ripe fruit on the bush, followed by rapid post-harvest cooling. For hand-harvested highbush and southern highbush cultivars, harvest all ripe berries on the bush every 7 days or less. Rabbiteye cultivars should be clean-harvested every 10-14 days. Post-harvest cooling is critical and is best accomplished through the use of partial-vacuum or forced-air systems that use fans to pull cold air through stacks of palletized fruit.

## **Blueberry** (continued)

## **HARVEST** (continued)

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Blueberry maggot | phosmet (Imidan 70W [24C label in GA, AR, SC, AL]) | 1.3 lb | +++++ | 24 hrs | 3 days | **Imidan is the material of choice.** BBM sprays should protect berries from the start of egg lay until the last berries are harvested. Imidan provides 10-14 days residual control. Do not apply more than 2 times. |
| | carbaryl (Sevin 80S) | 1.875-2.5 lb | +++ | 12 hrs | 7 days | BBM sprays should protect berries from the start of egg lay until the last berries are harvested. Seven provides 5-7 days residual effectiveness. |
| | carbaryl (Sevin 80WSP) | 1.875-2.5 lb | +++ | 12 hrs | 7 days | |
| | malathion (Malathion 57EC) | 1.5 pt | ++++ | 12 hrs | 1 day | BBM sprays should protect berries from the start of egg lay until the last berries are harvested. Malathion provides 5-7 days residual control. |
| | azinphos-methyl (Guthion 2L) | 2-3 pt | +++++ | 48 hrs/4 days | 7 days | **Azinphos-methyl is extremely toxic to applicators and field laborers.** REI is 48 hours for mowing, irrigation, and scouting only; four days for all other purposes. Do not make more than three applications per crop season. Allow at least 10 days between applications. Application by backpack or hand wand is prohibited. |
| | diazinon (Diazinon AG500) | 1 pt/100 gal | ++++ | 24 hrs | 7 days | Allow 14 days between applications. |
| Japanese beetle | carbaryl (Sevin 80S) | 1.25-2.5 lb | +++ | 12 hrs | 7 days | Japanese beetles can be abundant enough to require multiple applications. Do not apply more than 12.5 lb of Sevin 80 S or Sevin 80 WSP per acre per crop. Repeat applications as necessary up to a total of 5 times but not more often than once every 7 days. |
| | carbaryl (Sevin 80WSP) | 1.25-2.5 lb | +++ | 12 hrs | 7 days | |
| | imidacloprid (Provado 1.6F) | 6-8 fl oz | ++++ | 12 hrs | 3 days | Do not apply prior to bloom or during bloom. |

# **Blueberry** (continued)

## Post-harvest

**Blueberry bud mites –** This is a rarely seen, occasional pest in Georgia, but is quite common on certain cultivars in North Carolina. Use high volume (300 gal/A), high pressure (200 psi) applications of a post-harvest insecticide/miticide and horticultural oils. **In blocks infested with blueberry bud mite make two post-harvest applications of endosulfan**. Pruning and removing or destroying old blueberry canes can help reduce bud mite populations. Summer topping or hedging immediately after harvest is a common practice used to manage bush height; this practice also greatly reduces bud mite by removing old, infested fruiting twigs.

**Blueberry stem borer --** *Oberea myops*, is a longhorn beetle borer that also attacks rhododendron and azalea. This pest can be minimized by removing the infested portion of canes, often brown and wilted, as soon as larvae are detected in the summer. Cut the stems well below their brown, hollowed section, where the stem is still green and not hollow. Promptly destroy each wilted cane containing a larva. This insures that the larva does not migrate into the crown of the plant.

**Sharpnosed leafhopper –**The sharpnosed leafhopper is the vector (carrier) of blueberry stunt, a disease caused by a phytoplasma that results in severe stunting and loss of productivity in affected bushes. Stunt can be quite severe in North and South Carolina and has been reported from Arkansas. The disease is common on highbush and southern highbush cultivars, but rare on rabbiteye cultivars. Growers should be aware of the symptoms of stunt and be ready to spot-spray and remove infected bushes, followed by vector (leafhopper) control using insecticide sprays timed to coincide with population peaks of the leafhopper. In North Carolina, critical leafhopper control times are May, July and late September.

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Blueberry bud mite | endosulfan (Endosulfan 3EC) | 2qt/300 gal | ++++ | 24 hrs | | A post-harvest application, followed by another in August, is the general recommendation. Consult with an entomologist to insure proper timing of these applications. Do not apply more than 4 qt Endosulfan 3EC per acre per year **(for postharvest use only).** |

## **Blueberry** (continued)

## **Post-harvest** (continued)

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Blueberry bud mite (continued) | horticultural oil (JMS Stylet Oil) | 3-6 qt/100 gal | ++ | 4 hrs | 0 days | BBM can't be readily seen, and by the time symptoms are observed in the spring, the mites are too deep for effective treatment. |
| | horticultural oil (Stoller® Golden Pest Spray Oil) | 2 gal (low volume) application or 2 gal/100 gal (dilute spray) | ++ | 4 hrs | 0 days | |
| Yellownecked caterpillars, leaftiers, spanworms, azalea caterpillar | malathion (Malathion 57EC) | 1.5 pt | +++ | 12 hrs | 1 day | Foliage feeding caterpillars become more difficult to control as they mature. |
| | *Bacillus thuringiensis* [BT] (Dipel DF) | 0.5-1.0 lb | ++ | 4 hrs | 0 days | Dipel is an effective microbial insecticide. However, it should be applied to small, early-stage caterpillars. |
| | tebufenozide (Confirm 2F) | 4-8 fl oz | +++ | 4 hrs | 14 days | Confirm is very effective if applied to small, early-stage caterpillars. |
| | esfenvalerate (Asana 0.66 EC) | 4.8-16 oz | ++++ | 12 hrs | 14 days | Asana should be used as a salvage treatment for large caterpillars. It is very effective, but if used often, it encourages scale and mite buildup. |
| Flea beetles | carbaryl (Sevin 80S) | 1-2 lb | +++ | 12 hrs | 7 days | Sevin is effective against small to medium-sized caterpillars. |
| | diazinon (Diazinon AG500) | 1 pt/100 gal | +++ | 24 hrs | 7 days | Diazinon is effective against small to medium-sized caterpillars. |
| Sharpnosed leafhopper | esfenvalerate (Asana 0.66 EC) | 4.8-9.6 fl oz | ++++ | 12 hrs | 14 days | Some users may be allergic to Asana; discontinue use if skin or eyes become inflamed. |
| | malathion (Malathion 57EC) | 1.5 pt | ++++ | 12 hrs | 0 days | |

# **Blueberry** (continued)

## Late season and after harvest foliage management

**During fruit maturation and/or immediately following harvest, fungicide applications may be warranted for control of leaf spot and suppression of dieback diseases. Start applications as soon as leaf spots are first observed**.

**Blueberry rust –** Rust is predominantly a problem in the extreme southern blueberry production areas such as south Georgia. However, rust does occur in South Carolina and other locations. On susceptible varieties, rust can prematurely defoliate plants by late August. **Georgia currently has 24C state labels for use of Bravo Ultrex and Bravo WeatherStik for control of both rust and Septoria leaf spots; these chlorothalonil products make excellent rotation partners for the strobilurin-containing products, Cabrio and Pristine. However, Bravo Ultrex or Bravo WeatherStik can only be used after harvest, as fruit damage occurs with chlorothalonil usage. For labels and recommended rates for Georgia, contact your local county agent (for internet connections, click on these links – BRAVO ULTREX; BRAVO WEATERSTIK).**

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Septoria leaf spot (only) | Fosetyl-Al (Aliette WDG) | 5 lb | ++++ | 12 hrs | 12 hrs | Apply Aliette as a foliar spray. Subsequent applications can be made on 14-21 day intervals. Two or three fungicide applications following harvest are generally sufficient to prevent major outbreaks of Septoria leaf spot. Assuming that hedging is conducted immediately following harvest, this is a good time to consider an application. Do not exceed 4 applications per acre per year. |
| | azoxystrobin (Abound) | 6.2-15.4 fl oz | ++++ | 4 hrs | 0 days | Subsequent applications can be made on 14 day intervals Apply immediately following harvest. Two or three fungicide applications following harvest are generally sufficient to prevent major outbreaks of Septoria leaf spot. When hedging is conducted immediately following harvest, this is a good time to consider an application. Do not exceed 1.44 quarts per acre per season, and do not apply more than two sequential applications of Abound before switching to a fungicide with another mode of action. |
| | cyprodinil + fludioxonil (Switch 62.5WG) | 11-14 oz | +++ | 12 hrs | 0 days | Applications can be made on 7-10 day intervals when conditions warrant. Do not apply more than 56 oz of product per acre per year. Make no more than two sequential applications before using another fungicide with a different mode of action. |

## **Blueberry** (continued)

### **Late season and after harvest foliage management** (continued)

| Pest/Problem | Management Options | Amount of Formulation per Acre | Effectiveness (+) or Importance (*) | REI | PHI | Comments |
|---|---|---|---|---|---|---|
| Sharpnosed leafhopper | esfenvalerate (Asana 0.66 EC) | 4.8-9.6 fl oz | ++++ | 12 hrs | 14 days | Some users may be allergic to Asana; discontinue use if skin or eyes become inflamed. |
| | malathion (Malathion 57EC) | 1.5 pt | ++++ | 12 hrs | 0 days | |
| Septoria, anthracnose and rust leaf spots | pyraclostrobin (Cabrio EG) | 14 oz | ++++ | 24 hrs | 0 days | No more than 2 sequential applications of Cabrio should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Cabrio per acre per crop year. |
| | pyraclostrobin + boscalid (Pristine WG) | 18.5-23 oz | +++++ | 24 hrs | 0 days | No more than 2 sequential applications of Pristine should be made before alternating with fungicides that have a different mode of action. Do not apply more than four applications of Pristine per acre per crop year. |

# Efficacy of selected fungicides against diseases of blueberry

| Fungicide | Phytophthora root rot | Mummy Berry | Botrytis (gray mold) | Alternaria rot | Phomopsis twig blight | Ripe rot (Anthracnose) | Septoria leaf spot | Anthracnose leaf spot | Rust |
|---|---|---|---|---|---|---|---|---|---|
| Azoxystrobin **(Abound)** | NA[a] | ++ | NA | +++++ | ++ | +++++ | ++++ | ++++ | ??? |
| Captan **(Captan, Captec)** | NA | + | ++ | ++ | ++ | +++ | ++ | +++ | NA |
| Cyprodinil + fludioxonil **(Switch)** | NA | ++ | +++++ | +++++ | +++ | +++++ | +++ | ++++ | ??? |
| Fenhexamid **(Elevate)** | NA | ++ | +++++ | NA | NA | NA | NA | NA | NA |
| Fenhexamid + captan **(CaptEvate)** | NA | ++ | +++++ | ++ | ++ | +++ | ++ | ??? | NA |
| Fosetyl-Al **(Aliette WDG)** | +++ | NA | NA | NA | + | + | ++++ | ++++ | NA |
| Mefenoxam **(Ridomil Gold)** | ++++ | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyraclostrobin **(Cabrio)** | NA | NA | NA | ++++ | +++ | ++++ | ++++ | +++++ | +++++ |
| Pyraclostrobin + boscalid **(Pristine)** | NA | +++++ | +++++ | +++++ | +++ | +++++ | +++++ | +++++ | +++++ |
| Ziram **(Ziram)** | NA | + | ++ | + | +++ | +++ | ??? | ++ | ??? |

[a]NA = no significant activity, ??? = unknown activity; + = very limited activity, ++ = limited activity, +++ = moderate activity, ++++ = good activity, +++++ = excellent activity.

| Seasonal 'at a glance' fungicidal spray schedule options for blueberry | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Developmental Stage** | **Green tip** | **Bloom (2-3 applications)[a]** | **Petal Fall** | **10-14 Days after Petal Fall** | **20-24 Days after Petal Fall** | **Pre-Harvest[d]** | **After Harvest Foliage Management** |
| **Disease Controlled (Fungicides)** | **Mummy Berry (Pristine)**<br><br>**Twig blight (Pristine)** | **Mummy Berry and Twig blight (Pristine);[b] For serious Botrytis problems add (Switch, Elevate, CaptEvate, or Pristine); If Alternaria and Ripe Rot have been a problem add (Abound, Switch, Cabrio, or Pristine)[c]** | **Alternaria and Ripe Rots (Abound, Switch, Cabrio, or Pristine)** | **Alternaria and Ripe Rots (Abound, Switch, Cabrio, or Pristine)** | **Alternaria and Ripe Rots (Abound, Switch, Cabrio, or Pristine)** | **Alternaria and Ripe Rots (Abound, Switch, Cabrio, or Pristine);**<br><br>**Septoria Leaf Spot (Abound, Switch, Cabrio, Pristine, or Aliette)[e]** | **Septoria Leaf Spot (Abound, Switch, Cabrio, Pristine, or Aliette);**<br><br>**Anthracnose (Abound, Cabrio, Pristine, or Aliette);**<br><br>**Rust (Cabrio or Pristine)[f]** |

[a]Bloom times vary, due to varietal differences and the environment. Bloom sprays should provide protection against the primary pathogens of blooms for the entire bloom period. The number of applications required for bloom may vary from 1-3, depending on the season and the variety.

[b]Indar may also possibly be available for mummy berry control in 2005. If so, it will be available as a Section 18 label. Check with your local county agent for an update on this fungicide. When using Indar, always tank-mix with Captan. Captan provides additional control of mummy berry, and it has some activity against twig blight, Botrytis and fruit rots. However, it is mainly of value to prevent increased rots with the use of Indar, as well as providing resistance management.

[c]Many of the fungicides which are registered for rot control may also have activity against twig dieback organisms, such as *Phomopsis* species.

[d]In wet years, pre-harvest and post-harvest rots may be a potential problem. Under these conditions, 1-2 applications of a pre-harvest material may be necessary for rot control.

[e]Septoria leaf spot is generally controlled with 2-4 fungicide applications. This disease is more problematic on highbush blueberry varieties, but some rabbiteye varieties may experience premature defoliation from Septoria as well. Aliette is best utilized after harvest, since it is not as efficacious against the fruit rots, and it serves as a resistance management tool.

[f]Rust is problematic on some blueberry varieties, especially in far southern areas such as south Georgia, and it can result in complete, premature defoliation on susceptible varieties. Scout for rust in mid to late July. Applications of fungicides (2-3) from August to mid-September will generally result in good rust management. Some varieties may require yearly rust control.

# Weed Management

## Blueberry

| Weed/Timing | Material | Amount of Formulation per Acre | Crop Age Restrictions | REI (hrs) | Comments |
|---|---|---|---|---|---|
| **PREPLANT/ SITE PREPARATION** | **Glyphosate**<br>Roundup WeatherMax 5.5 SL or<br>Various Generic Formulations 4 SL | 1.4 to 2.8 pt<br><br>1 to 2 qt | Apply 30 days prior to planting. | 4 | Use to kill strips through blueberry fields prior to planting. Generic formulations may require the addition of a surfactant. See label for details on controlling specific perennial weeds. |
| **PREEMERGENCE**<br>Annual grasses and small seeded broadleaf weeds | **Napropamide**<br>Devrinol 50 DF | 8 lb | Newly planted (once soil has settled after transplanting) and established plantings. | 12 | Soil surface should be relatively free of weeds and plant residue. Rainfall or overhead irrigation within 1 to 2 days of application is needed for activation. |
| | **Oryzalin**<br>Surflan 4 AS or FarmSaver Oryzalin | 2 to 4 qt | Newly planted (once soil has settled after transplanting) and established plantings. **May be used in bark bed production system.** | 24 | Oryzalin may be tank mixed with paraquat or Rely for postemergence weed control. In established plantings tank mix with simazine for broad spectrum residual weed control. |
| | **Norflurazon**<br>Solicam 80 DF | 1.25 to 5 lb | Plantings established at least 6 months. **May be used in bark bed production system.** | 12 | Tank mix with paraquat or Rely for control of emerged weeds. Tank mix with simazine or diuron for expanded residual control**. Do not apply within 60 days of harvest.** |
| | **Benefin + Oryzalin**<br>XL 2G | 150 lb | Newly planted and non-bearing plantings. **May be used in bark bed production system.** | 24 | Apply once soil has settled after transplanting with a drop or rotary spreader. Do not apply within on year of harvest. This product will not control emerged weeds. |

| Weed/Timing | Material | Amount of Formulation per Acre | Crop Age Restrictions | REI (hrs) | Comments |
|---|---|---|---|---|---|
| **PREEMERGENCE** Broadleaf and grass weeds | **Isoxaben + Trifluralin** Snapshot 2.5G | 150 to 200 lb | Newly planted and non-bearing plantings. **May be used in bark bed production system.** | 12 | Allow soil to settle after transplanting prior to application. Apply with a drop or rotary spreader. Do not apply within 1 year of harvest. This product has no postemergence activity. |
| **PREEMERGENCE** Broadleaf weeds | **Isoxaben** Gallery | 0.66 to 1.33 lb | Newly planted or non-bearing plantings. **May be used in bark bed production system.** | 12 | Apply in at least 10 gallons per acre. Tank mix with Surflan for broad spectrum residual control. Do not apply within 1 year of harvest. |
| **PREEMERGENCE** Annual weeds and some perennial weeds | **Dichlobenil** Casoron 4G | 100 to 150 lb | Newly planted (4 wks after transplanting) and established plantings. **May be used in bark bed production system.** | 12 | Apply in January or February for best results. Warm temperatures increase volatility. Overhead irrigation may be use for activation when applied in early spring. |
| | **Hexazinone** (Velpar) 2 SL (Velpar) 80 WDG | 0.5 to 1 gal 1.3 to 2.6 lb | Blueberry plantings established at least 3 years | 24 | **Apply before blueberry leaf emergence at least 90 days before harvest.** Use lower rates on poorly drained soils. Due to variability in soil type limit initial use to a small area. Do not use on sand, loamy sand, or sandy loam soils. Do not use on soils having less than 3% organic matter. |
| **PREEMERGENCE** Broadleaf weeds and some annual grass species | **Diuron** Karmex 80 DF or various generic formulations | 1.5 to 2 lb | Blueberry plantings established 1 year. | 12 | Diuron is registered for use in AR, GA, MS NC, and SC only. Apply as a directed spray in the spring and repeat application in the fall if needed. Do not apply to soils having less than 1 % organic matter. Do not use on loamy sand or sand soils. Tank mix with glyphosate, paraquat, or Rely for post-emergence control. |

| Weed/Timing | Material | Amount of Formulation per Acre | Crop Age Restrictions | REI (hrs) | Comments |
|---|---|---|---|---|---|
| **PREEMERGENCE**<br>Broadleaf weeds and some annual grass species (Cont'd) | **Simazine**<br>Princep 4 L or<br>Princep Cal 90 or various generic formulations | 2 to 4 qt<br>2.2 to 4.4 lb | Newly planted (use half rate and apply once soil has settled after transplanting) and established plantings. **May be used in bark bed production system.** | 12 | Tank mix with glyphosate, paraquat, or Rely for postemergence weed control. The addition of oryzalin or Solicam with simazine will extend residual grass control several weeks. Rate is soil texture dependent. Do not apply when fruit is present. **Do not apply to blueberry planted less than 6 months in bark production system.** |
| | **Terbacil**<br>Sinbar 80 WP | 1 to 2 lb | Plantings established 1 year or more. | 12 | Apply as directed spray in early fall or spring before fruit set. Do not contact foliage. **Do not apply with in 70 days of harvest.** Do not use loamy sand or sandy soils. Do not use on soils having less than 1 % organic matter. |
| **POSTEMERGENCE**<br>Non-selective control | **Glufosinate**<br>Rely 1L | 3 to 5 qt | Newly planted (shielded) and established blueberry. **May be used in bark bed production system.** | 12 | Do not allow spray solution to contact desirable foliage or green, uncallused bark. Use a minimum spray volume of 20 gal./A. **Do not apply within 14 days of harvest** or exceed 12 qts. in 1 year. May be tank mixed with preemergence herbicides. |
| **POSTEMERGENCE**<br>Non-selective control | **Glyphosate**<br>Roundup WeatherMax 5.5 SL or<br>Various Generic Formulations 4 SL | 1.4 to 2.8 pt<br><br>1 to 2 qt | Blueberry established 1 year or more. **May be used in bark bed production system.** | 4 | Leaf, stem, or exposed root contact with spray can kill or injure crop. Rainfall or irrigation after application in bark bed production systems can result in glyphosate root uptake and crop injury. Apply as a directed or shielded spray, or with a wiper applicator. **Do not apply within 14 days of harvest.** Generic formulations may require additional surfactant |

| Weed/Timing | Material | Amount of Formulation per Acre | Crop Age Restrictions | REI (hrs) | Comments |
|---|---|---|---|---|---|
| **POSTEMERGENCE**<br>Non-selective control | **Paraquat**<br>Gramoxone Max 3 SL | 1.7 to 2.7 pt | Newly planted (shielded) and blueberry established plantings. **May be used in bark bed production system.** | 12 | Do not allow herbicide to contact desirable foliage or uncallused bark. Young plants must be shielded. The addition of a non-ionic surfactant at 0.25 % v/v (1qt per 100 gal. of spray solution) is necessary for adequate control. Tank mixed with preemergence herbicides for residual control. **Use of paraquat in rabbiteye blueberry can increased incidence of stem blight if herbicide contacts green stems. Rabbiteye producers may want to consider other non-selective postemergence options.** |
| **POSTEMERGENCE**<br>Broadleaf weeds and yellow nutsedge | **Bentazon**<br>Basagran | 1.5 to 2 pt | Newly planted or non-bearing plantings. **May be used in bark bed production system.** | 48 | Apply as a directed spray in a minimum spray volume of 20 gal./A. Add 2 pt of crop oil concentrate per acre for optimum results. Timely, sequential applications will control yellow nutsedge. Refer to label for details regarding nutsedge. Do not apply within 1 year of harvest. |
| **POSTEMERGENCE**<br>Annual and perennial grasses | **Clethodim**<br>Select 2EC or Arrow 2 EC | 6 to 8 oz | Newly planted or non-bearing plantings. **May be used in bark bed production system.** | 12 | Low rates are for annual grass weeds. High rates and sequential applications are for perennial grasses (bermudagrass or johnsongrass). Do not apply within 1 year of harvest. The addition of a non-ionic surfactant at 0.25 % v/v (1 qt/100 gal. of spray solution) is required. Best results occur when applications are made to actively growing grasses. |

| Weed/Timing | Material | Amount of Formulation per Acre | Crop Age Restrictions | REI (hrs) | Comments |
|---|---|---|---|---|---|
| **POSTEMERGENCE** Annual and perennial grasses (Cont'd) | **Fluazifop** Fusilade DX | 12 to 24 oz | Newly planted and non-bearing plantings. **May be used in bark bed production system.** | 12 | Sequential applications will be necessary for perennial grass control. The addition of a non-ionic surfactant (1 qt/100 gal of water) or crop oil concentrate (1 gal./100 gal. of water) is necessary. Do not apply within 1 year of harvest. Do not apply over the top or crop injury will occur. |
| | **Sethoxydim** Poast | 1 to 2.5 pt | Newly planted and established plantings. **May be used in bark bed production system.** | 12 | Sequential applications will be necessary for perennial grass control. The addition of a non-ionic surfactant (1 qt/100 gal of water) or crop oil concentrate (1 gal/100 gal. of water) is necessary for optimum results**. Do not apply within 30 days of harvest.** Total use cannot exceed 5 pt/A. |

# Suggested Herbicide Programs (Blueberry)

| Crop Age | Fall | Winter | Spring | Summer |
|---|---|---|---|---|
| Newly Planted | Glyphosate (apply fall or winter at least 30 days prior to planting) | | Oryzalin (Once soil settles after transplanting) | Oryzalin + Paraquat (rabbiteye: see comments) or Rely (once control from initial application deteriorates); Fusilade, or Poast, or Select (as needed); Basagran (yellow nutsedge). |
| | | | Devrinol (Once soil settles after transplanting) | Paraquat(rabbiteye: see comments) or Rely (multiple applications as needed); Fusilade, Poast, or Select (as needed); Basagran (yellow nutsedge). |
| | | | Simazine (half rate) + Oryzalin (once soil settles after transplanting) | Paraquat (rabbiteye: see comments) or Rely (multiple applications as needed); Fusilade, or Poast, or Select (as needed); Basagran (yellow nutsedge). |
| Blueberry Established 1 year or more | Simazine (half rate) + paraquat (rabbiteye: see comments) or Rely; Glyphosate (spot treat for perennial weeds) | | Simazine (half rate) + Oryzalin or Solicam + Paraquat (rabbiteye: see comments), Glyphosate, or Rely | Solicam or Oryzalin + Paraquat (rabbiteye: see comments) or Rely (multiple applications as needed) or Poast. Glyphosate (spot treat for perennial weeds) |
| | Diuron + Paraquat (rabbiteye: see comments) or Rely; Glyphosate (spot treat for perennial weeds) | | Diuron + Paraquat (rabbiteye: see comments), Glyphosate, or Rely | Solicam or Oryzalin + Paraquat (rabbiteye: see comments) or Rely (multiple applications as needed) or Poast. Glyphosate (spot treat for perennial weeds) |

| Crop Age | Fall | Winter | Spring | Summer |
|---|---|---|---|---|
| Blueberry established 1 year or more | Simazine + Paraquat (rabbiteye: see comments) or Rely; Glyphosate (spot treat for perennial weeds) | | Sinbar (not for light soils)+ Paraquat (rabbiteye: see comments), Glyphosate, or Rely | Paraquat (rabbiteye: see comments) or Rely (multiple applications as needed) or Poast. Glyphosate (spot treat for perennial weeds) |
| Blueberry established 3 years or more | Simazine + Paraquat (rabbiteye: see comments) or Rely Glyphosate (spot treat for perennial weeds) | Velpar (**follow all label precautions and restrictions-only for high organic matter sites**) | | Paraquat (rabbiteye: see comments) or Rely (multiple applications as needed) or Poast. Glyphosate (spot treat for perennial weeds) |

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