

Commercial Crop Production: Small Fruits

Blackberry

Blackberries are the most commonly grown brambles in Louisiana. Blackberries are native to Louisiana and most commercial cultivars are well-adapted to growing conditions in the state. Thorny type varieties such as CVs. Brazos, Brison, Womack are very productive and early bearing in Louisiana but are susceptible to the fungal disease rosette (double blossom). These cultivars require careful attention to disease management tactics such as pruning on time and preventative fungicide spray programs. Alternatives to the thorny varieties are CVs. Navaho and Arapaho, which are thornless types. These two varieties are not as susceptible to double blossom and don't require as high a level of management as the thorny types

Disease

Symptoms, source of inoculum and management of soybean diseases.

Disease	Symptoms	Source of Inoculum	Management
Anthraco nose (<i>Elsinoe veneta</i>)	Symptoms appear on canes and leaves. Both current and second-year canes can be affected. Circular, light gray spots form on canes; as the disease progresses the spots become sunken with a dark purple margin. Leaf spots start off yellow, turn grey with a purple border and eventually dry up and drop out, resulting in shot holes. Fruit may ripen abnormally and have an "off" flavor. Anthracnose can cause loss of winter hardiness.	The fungus overwinters on bark and cane lesions. In the spring spores are produced, released and spread to new canes by splashing rain and wind.	Remove and destroy infected canes. Do not compost canes. Remove and destroy wild brambles. Immediately after harvest remove floricanes to reduce overwintering fungus. Follow a fungicide spray program. Do not use lime sulfur.
Botrytis fruit rot and cane blight (<i>Botrytis cinerea</i>)	White lesions (bleaching effect) form on new canes and floricanes. Cane blight is more severe on blackberries than raspberries. Botrytis causes flowers to shrivel and turn brown. As the fruit develops and ripens, the fruit becomes soft and covered with grey tufts of fungal spores.	The fungus survives as sclerotia (overwintering structure) on infected canes and dead leaves and as spores on mummified fruit. During wet and cool conditions, sclerotia germinate and the fungus begins to sporulate. Spores are dispersed by wind, rain and overhead irrigation.	Promote good air circulation in the planting by pruning and trellising plants. Minimize the use of nitrogen fertilizer. Partial resistance is available for red raspberry varieties. Minimize fruit damage during harvest. Follow a fungicide spray schedule.
Cane blight (<i>Leptosphaeria coniothyrium</i>)	Dark red to purple lesions form on the canes around wounds. Lesions may be on one side of the cane or may girdle it and kill the shoots.	The fungus survives in infected tissues and dead canes. Spores are rain-splashed.	Prune out infected canes and remove floricanes immediately after harvest. Avoid wounding the plants.
Cane and leaf rust (<i>Kuehneola uredinis</i>)	First seen on floricanes in late spring when large yellow pustules split the bark. Small yellow pustules develop on the lower surface of leaves on the floricane and may lead to premature defoliation.	The fungus overwinters on infected canes. Spores are wind dispersed.	Prune out old diseased canes after harvest. Follow the fungicide spray schedule.

Disease	Symptoms	Source of Inoculum	Management
Orange rust (<i>Gymnoconia nitens</i>)	Disease is evident on new growth in spring as many weak, spindly shoots are formed rather than one strong shoot. Bright orange pustules form on the undersides of infected leaves, and no blooms are produced on the floricanes.	The fungus overwinters within systemically infected canes. Spores are wind dispersed.	Use only disease-free planting materials. Remove infected plants as soon as they are observed. Follow a fungicide spray schedule.
Phytophthora root rot (<i>Phytophthora</i> spp.)	Infected primocanes may rapidly wilt and die in the spring, or they (and the floricanes) may slowly become chlorotic, wilt and die in the summer. Infected roots exhibit a reddish-brown discoloration of the cortex.	The pathogen can be introduced on infected planting material, but it also survives in soil. Spreads primarily in water.	Use disease-free transplants, improve drainage and avoid low spots. Rogue out infected plants and treat surrounding plants with fungicide.
Powdery mildew (<i>Podosphaera aphanis</i>)	A whitish gray coat covers both sides of the leaves, flowers, fruit and shoots. Diseased new growth is stunted and distorted.	The fungus overwinters as mycelium or chasmothecia in dormant buds of stunted cane tips. Spores are spread by wind.	Blackberries are not susceptible to powdery mildew. Plant resistant red raspberry varieties such as Chief, Marcy and Malling Orion. Follow a fungicide spray schedule.
Rosette (double blossom) (<i>Cercospora rubi</i>)	Infected buds give rise to a proliferation of small shoots or witches' broom. Infected flower buds give rise to distorted blossoms from which fruit do not develop.	The fungus survives in wild blackberries and dewberries. Spores are wind dispersed.	Eradicate wild blackberries and dewberries in the vicinity. Remove infected blossom clusters before they open. Remove the floricanes immediately after harvest. Follow a fungicide spray schedule.
Septoria leaf spot (<i>Septoria rubi</i>)	Frogeye lesions with whitish centers and brown to purple margins are produced on leaves. Similar lesions are found on canes and petioles.	The fungus overwinters in dead leaves and stems. Spores are wind dispersed.	Follow a fungicide spray schedule for leaf spots.
Spur blight (<i>Didymella applanata</i>)	Symptoms appear in primocanes in late spring. Brownish purple lesions appear just below on the lower portion of the stem just below the leaf or bud. In late fall, the bark of infected canes splits longitudinally. Leaflets may have V-shaped brown lesions with chlorosis.	The fungus survives the winter in lesions on diseased canes. Spores are carried to new growth in the spring by splashing rain and wind.	Promote good air circulation in the planting by pruning and trellising plants. Avoid excessive nitrogen applications, which promote rapid and excessive growth of new tissue. Remove and destroy wild brambles. Follow a fungicide spray schedule.

Table 1. List of disease-resistant thorny blackberry cultivars recommended for production in Louisiana.

Type, cultivars	Anthraco-nose	Rosette (double blossom)	Orange Rust	Sunburn (abiotic)
Brazos	R	S	-	-
Brison	-	S	-	-
Cheyenne	-	S	R	-
Womack	-	S	-	-
Apache	-	S	-	-
Rosborough	-	S	-	-
Shawnee	R	S	R	-
Choctaw	-	S	R	-
Kiowa	-	S	R	-
Chickasaw	R	S	R	-

Table 1, 2 and 3 Legend

Resistance Category	Abbreviation
Susceptible	S
Moderately Susceptible	MS
Moderately Resistant	MR
Resistant	R
No data for the variety or disease	-

Table 2. List of disease-resistant thornless blackberry cultivars recommended for production in Louisiana.

Type, cultivars	Anthraco-nose	Rosette (double blossom)	Orange Rust	Sunburn (abiotic)
Arapaho	-	R	R	-
Navaho	R	MR	S	-
Apache	R	R	-	S
Ouachita	R	R	R	S

Table 3. List of disease-resistant trailing blackberry cultivars recommended for production in Louisiana.

Type, cultivars	Anthraco-nose	Rosette (double blossom)	Orange Rust	Sunburn (abiotic)
Youngberry	-	S	-	-

Table 4. Seasonal fungicide spray schedule for blackberry, raspberry and other bramble diseases.

Developmental Stage	Diseases
Delayed dormant (Bud swell to green tip)	Anthrachnose Cane blight Spur blight
Shoots 6 inches long until prebloom	Anthrachnose Cane blight Leaf spots Phytophthora root rot Powdery mildew Rusts Spur blight
Early bloom (5-10%)	Anthrachnose Botrytis gray mold Cane blight Leaf spots Rosette Rusts
Full bloom (Bramble bloom periods are protracted. Bloom and cover spray stages can be difficult to define clearly. Make sure that the pathogens indicated are addressed with a thorough fungicide program as defined by the variety but do not exceed labeled rates or spray intervals.)	Anthrachnose Botrytis gray mold Cane blight Leaf spots Rosette Rusts
Petal fall	Anthrachnose Botrytis gray mold Cane blight Leaf spots Rosette Rusts
Cover sprays	Anthrachnose Botrytis gray mold Cane blight Leaf spots Rosette Rusts

Developmental Stage	Diseases
Preharvest (14 days before anticipated harvest date)	Anthrachnose Botrytis gray mold Cane blight Leaf spots Rosette Rusts
Harvest	Anthrachnose Botrytis gray mold Cane blight Leaf spots Rosette Rusts
Postharvest	Cane blight Leaf spots Orange cane blotch Phytophthora root rot Powdery mildew Rusts

Table 5. Efficacy of selected fungicides against blackberry, raspberry and other bramble diseases.**Table Legend**

Efficacy	Rating
Excellent	5
Very Good	4
Good	3
Fair	2
Poor	1
Ineffective	-

Table was reproduced from the 2023 Southeast Regional Caneberries Integrated Management Guide (https://secure.caes.uga.edu/extension/publications/files/pdf/AP%20121-3_1.PDF).

The efficacy rating could be affected by resistance development. If resistance has occurred, use of fungicides in the same class would likewise show resistance, and a substitute fungicide should be considered for pathogen management.

No data is provided for products not labeled for the specific disease or if the efficacy is unknown. These ratings are benchmarks; actual performance will vary.

Chemical name	Product Name	Anthraco	Cane blight	Spur blight	Leaf spots	Botrytis gray mold	Rusts	Powdery mildew	Rosette	Phytophthora root rot
azoxystrobin	Abound FL	5	5	5	4	-	5	5	5	-
azoxystrobin + propiconazole	Quilt Xcel	5	5	5	4	-	5	5	5	-
captan	Captan 80WDG, Captec 4L, Captan 50W	3	2	2	-	2	-	-	-	-
copper	various products	1	1	1	-	-	-	-	-	-
myclobutanil	Rally 40WSP	-	3 After pruning	-	-	-	5	5	-	-
mono and di-potassium salts of phosphorus acid or potassium phosphite	K-phite or ProPhyt	-	-	-	-	-	-	-	-	4
pyraclostrobin	Cabrio EG	5	5	5	5	-	5	5	-	-
pyraclostrobin + boscalid	Pristine WG	5	5	5	4	4 ^R	5	-	5	-
cyprodinil + fludioxonil	Switch 62.5WG	-	-	-	-	5	-	-	5	-
fenhexamid	Elevate 50WDG	-	-	-	-	5	-	-	-	-
iprodione	Rovral 4F, Nevado 4F	-	-	-	-	3	-	-	-	-
mefenoxam	Ridomil Gold SL	-	-	-	-	-	-	-	-	4
fosetyl-AL	Aliette WDG	-	-	-	-	-	-	-	-	4
sulfur	various products	-	-	-	-	-	-	3	-	-
propiconazole	Tilt 3.6EC	-	-	-	4	-	5	-	-	-
oxathiapiprolin	Orondis Gold 200	-	-	-	-	-	-	-	-	4

^R Isolates of this pathogen with resistance to this fungicide have been identified in southeastern United States.

Table 6. Recommended pesticides, rates and pesticide use restrictions for blackberry, raspberry and other bramble diseases.

Chemical Name	Product Name ¹	Product Mode of Action Group ²	Rate ³	Maximum Use	PHI ⁴	Diseases
azoxystrobin	Abound FL	11	6.0-15.5 fl oz	92.3 fl oz	0	Anthracnose, Cane blight, Leaf spots, Rosette, Rusts, Spur blight
azoxystrobin + propiconazole	Quilt Xcel	11, 3	14-21 fl oz	105 fl oz	30	Anthracnose, Cane blight, Leaf spots, Powdery mildew, Rosette, Spur blight
captan	Captan 50WP	M4	2-4 lb	10 lb ai	3	Anthracnose, Cane blight, Leaf spots, Spur blight
captan	Captec 4L	M4	0.75-1.0 qt/100 gal	10 lb ai	3	Anthracnose, Cane blight, Leaf spots, Spur blight
copper	ChampWG	M1	2-3 lb	See labels	1-2	Anthracnose, Cane blight, Leaf spots, Orange cane blotch, Spur blight
copper	Kocide 3000	M1	0.8-1.3 lb	See labels	1-2	Anthracnose, Cane blight, Leaf spots, Orange cane blotch, Spur blight
copper	Kocide 2000	M1	1.5-2.3 lb	See labels	1-2	Anthracnose, Cane blight, Leaf spots, Orange cane blotch, Spur blight
copper	Cuprofix Disperss	M1	2.5-5 lb	See labels	0.5	Anthracnose, Cane blight, Leaf spots, Orange cane blotch, Spur blight
copper	Cuprofix Ultra 40 Disperss	M1	1.25-2.5 lb	See labels	0.5	Anthracnose, Cane blight, Leaf spots, Orange cane blotch, Spur blight
fosetyl-AL	Aliette WDG	33	5 lb	20 lb	60	Phytophthora root rot
myclobutanil	Rally 40WSP	3	1.25-3 oz	10 oz	0	Powdery mildew, Rusts
phosphorous acids	Confine Extra	33	1-3 qt	See labels	0	Leaf spots, Phytophthora root rot
phosphorous acids	Fosphite	33	1-3 qt	See labels	0	Leaf spots, Phytophthora root rot
phosphorous acids	Fungi-phite	33	1-2 qt	6 app	0	Leaf spots, Phytophthora root rot
phosphorous acids	Helena Prophyt	33	4 pt	4 app	0	Leaf spots, Phytophthora root rot
phosphorous acids	Rampart	33	1-3 qt	See labels	0	Leaf spots, Phytophthora root rot
propiconazole	Bumper 41.8EC	3	6 fl oz	30 fl oz	30	Leaf spots (post-harvest only), Rusts, Powdery mildew
propiconazole	Propi-Star EC	3	6 fl oz	30 fl oz	30	Leaf spots (post-harvest only), Rusts, Powdery mildew
propiconazole	Tilt	3	6 fl oz	30 fl oz	30	Leaf spots (post-harvest only), Rusts, Powdery mildew
propiconazole	Topaz	3	6 fl oz	30 fl oz	30	Leaf spots (post-harvest only), Rusts, Powdery mildew
pyraclostrobin	Cabrio EG	11	14 oz	56 oz	0	Anthracnose, Cane blight, Leaf spots, Powdery mildew, Rusts

Chemical Name	Product Name ¹	Product Mode of Action Group ²	Rate ³	Maximum Use	PHI ⁴	Diseases
pyraclostrobin + boscalid	Pristine WG	11, 7	18.5-23 oz	92 oz	0.5	Anthracnose, Botrytis gray mold, Cane blight, Leaf spots, Powdery mildew, Rosette, Rusts, Spur blight
cyprodinil + fludioxonil	Switch 62.5WG	9, 12	11-14 oz	56 oz	0	Botrytis gray mold
fenhexamid	Elevate 50WDG	17	1.5 lb	6 lb	0	Botrytis gray mold (resistance isolates have been detected in other regions of the south)
iprodione	Iprodione 4L AG	2	1-2 pt	4 app	0	Botrytis fruit rot
iprodione	Nevado 4F	2	1-2 pt	4 app	0	Botrytis fruit rot
iprodione	Rovral 4F	2	1-2 pt	4 app	0	Botrytis fruit rot
mefenoxam	Ridomil Gold SL	4	0.25 pt/1,000 linear feet, 3 ft band	1 app	See label	Phytophthora root rot (raspberries only)
sulfur	Microfine Sulfur	M	10-30 lb	See labels	1	Anthracnose, Cane blight, Powdery mildew, Spur blight
sulfur	Microthiol Disperss	M	6-15 lb	See labels	1	Anthracnose, Cane blight, Powdery mildew, Spur blight
sulfur	Yellow Jacket Dusting Sulfer	M	3-50 lb	See labels	1	Anthracnose, Cane blight, Powdery mildew, Spur blight

¹ Reference to commercial or trade names is made with the understanding that no discrimination is intended nor endorsement of a particular product by LSU or the LSU AgCenter is implied.

² Mode of action groups are determined by the Fungicide Resistance Action Committee (FRAC).

³ Rates are the amount of formulation (product) per acre unless otherwise indicated.

⁴ Postharvest interval (PHI) is the minimum number of days allowed between the last application and harvest.

The blackberry (brambles) section was revised October 2023 by R. Singh.