

## BRAMBLE SPRAY PROGRAM

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NOTES: For imported fire ant, treat active mounds off season with directed bait formulations like Clinch, Esteem, Extinguish, and Logic. Insect growth regulators will give complete control after 30 days. Always follow label directions for best results.  
The Insecticide Resistance Action Committee (IRAC) groups insecticides into mode of action (MOA) categories. These categories are listed following the pesticide and formulation names. To reduced the risk of resistance development, avoid successive applications of insecticides with the same MOA for the same pest. Organically acceptable insecticides (OMRI listed) are indicated in Comments and Precautions.

**TABLE 7-5. BRAMBLE SPRAY PROGRAM**

When to Spray	Pest	Pesticide, Formulation, and MOA	Rate of Formulation Per Acre	Comments and Precautions
<b>LATE WINTER OR EARLY SPRING</b> when new growth is less than 0.5 in. long	Anthrachnose, Spur blight, Cane blight	<b>FUNGICIDE:</b> liquid lime-sulfur OR Bordeaux (Cuprofix Disperss)	6 to 12 gal  5 to 6 lb	This is an important spray for good disease control. Make sure canes are thoroughly covered.
	Raspberry crown borer	<b>INSECTICIDE:</b> bifenthrin, MOA 3A (Brigade WSB) MOA 3A malathion, MOA 1B (Malathion 57EC)	16 oz  3 pt	Removing infested canes is an important cultural control. In blocks with a history of raspberry crown borer, apply an insecticide at delayed dormant to green tip to provide a barrier for larvae boring into canes as they emerge from overwintering hibernacula. Use sufficient spray volume to assure good coverage. Follow label instructions for water volume and application methods for Brigade WSB
<b>JUST BEFORE BLOOMS OPEN</b>	Anthrachnose, Cane blight, Cane canker, Leaf spots, Spur blight	<b>FUNGICIDE:</b> boscalid + pyraclostrobin (Pristine) 38 WDG OR captan (Captan 50W) (Captan 80WDG) (Captan 4L) OR pyraclostrobin (Cabrio 20EG) OR azoxystrobin (Abound 2SC)	18.5 to 23 oz  4 lb 2.5 lb 2 qt  14 oz  6.2 to 15.4 fl oz	Do not apply more than 20 lb of Captan 50W or 12.5 lb Captan 80WDG per acre per season. Captan 50W is a 24C registration. To avoid resistance, do not make more than four applications of Abound, Cabrio, and Pristine per season.
	Strawberry clipper (weevil)	<b>INSECTICIDE:</b> bifenthrin, MOA 3A (Brigade 10WSB) carbaryl, MOA 1A (Sevin 80WSP) malathion, MOA 1B (Malathion 57EC)	8 to 16 oz  1.25 to 2.5 lb  1.5 to 3 pt	Bifenthrin in a long-residual insecticide. To protect pollinators, do not apply within 5 days of bloom. Do not apply malathion within 3 days of first bloom.
	Gall midge, Leafrollers, Tarnished plant bug	bifenthrin, MOA 3A (Brigade 10WDB) malathion, MOA 1B (Malathion 57EC)	8 to 16 oz  3 pt	
	Flower thrips	pyrethrins MOA 3 (Pyganic 1.4EC) (Pyganic 5EC) spinetoram, MOA 5 (Delegate) spinosad, MOA 5 (Entrust) (SpinTor 2SC)	16 to 64 fl oz 4.5 to 18 fl oz  3 to 6 oz  1.25 to 2.5 oz 4 fl oz	Spinosad is of little risk to pollinators after drying. Pyganic is <b>OMRI</b> listed.  Entrust is <b>OMRI</b> listed.
<b>BLOOM AND PETAL FALL SPRAY</b>	Double blossom	azoxystrobin (Abound 2SC)	6.2 to 15.4 fl oz	Sprays during bloom are most important for control of double blossom. Begin sprays when first infected blossoms open and continue every 10 to 14 days through bloom. Rotate Abound or Pristine with Switch to avoid resistance. It is important to protect primocanes as long as infected flowers continue to open. Pristine will also control botrytis. Crop injury may occur with Bordeaux mix under slow drying conditions or in hot weather. Some injury often accompanies the use of copper fungicides; if injury is excessive, discontinue use.
		OR boscalid + pyraclostrobin (Pristine 38WDG)	18.5 to 23 oz	
		OR Bordeaux (Cuprofix Disperss)	2.5 lb	
		OR cyprodinil + fludioxonil (Switch 62.5 WG)	11 to 14 oz	

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<b>BLOOM AND PETAL FALL SPRAY</b> (continued)	Botrytis fruit rot	captan (Captan 50W) (Captan 80 WDG) (Captan 4L) OR fenhexamid (Elevate) 50 WDG OR ipridione (Rovral 50 WG) (Rovral 4F) OR cyprodinil + fludioxonil (Switch 62.5 WG) OR captan + fenhexamide (CaptEstate) 68WDG	4 lb 2.5 lb 2 qt  1.5 lb  1 to 2 lb 1 to 2 pt  11 to 14 oz  3.5 lb	Apply at early bloom and repeat at full bloom. Rotate Rovral, Switch, and Elevate or CaptEstate to reduce the likelihood of resistance.
	Cane canker, Cane blight, Spur blight	captan (Captan 50W) OR pyraclostrobin (Cabrio 20EG)	4 lb 14 oz	
	Flower thrips	Same as JUST BEFORE BLOOMS OPEN.	3 to 6 oz	
	Plant bugs, Stink bugs	esfenvalerate (Asana XL)  zeta-cypermethrin (Mustang Max) MOA 3	9.6 fl oz  4 fl oz	Avoid applications when bees are foraging. Apply during evenings or early morning.  Can be applied up to 1 day before harvest. Do not apply more than 0.15 lb AI per acre per season.
	Rednecked cane borer	bifenthrin, MOA 3A (Brigade WSB) malathion, MOA 1B 57 EC		Scout canes during winter pruning. If 10% or greater of the primocanes per row, or more of the primocanes than will be removed through pruning have rednecked cane borer galls, control is justified. Treat after first bloom or when adults are observed and may be continued until adults are no longer present. Do not apply pesticides when bees are foraging.
	Strawberry clipper (weevil)	bifenthrin, MOA 3A (Brigade 10WDB) malathion, MOA 1B (Malathion 57EC)	8 to 16 oz 1.5 to 3 pt	Apply at first flower. bloom. Do not apply pesticides when bees are foraging.
<b>POST-BLOOM SPRAYS</b> —every 14 days after petal fall until harvest	Anthrachnose, Leaf spots	<b>FUNGICIDE:</b> captan (Captan 50W) (Captan 80 WDG) (Captan 4L)	4 lb 2.5 lb 2 qt	
	Rusts			See comments below for rust sprays. Cabrio 20EG applied at this time for rust control also has activity on anthracnose, spur blight, and cane blight.
	Double blossom			Additional sprays may be needed to protect primocanes if infected flowers continue to open. See Bloom and Petal Fall Spray for fungicide options.
	Strawberry clipper, Blackberry psyllid, Japanese beetles, Stink bugs	<b>INSECTICIDE:</b> carbaryl, MOA 1 (Sevin 80WSB)  malathion, MOA 1B 25 WP	1.25 to 2.5 lb 5 fl oz  1.5 to 3 pt	Blackberry psyllid overwinter on nearby conifers and move to blackberry in April or May. Spray when psyllids or injury are first observed.
	Stink bugs	bifenthrin, MOA 3 (Brigade 10WDB) zeta-cypermethrin (Mustang Max) MOA 3	3.2 to 6.4 fl oz  4 fl oz	Repeated use of pyrethroid insecticides may flare spider mite populations.  Can be applied up to 1 day before harvest. Do not apply more than 0.15 lb AI per acre per season.
	Mites	bifenazate, MOA Unknown (Acramite 50WS)	1 lb	There is no research-based treatment threshold for spider mites in caneberries, but treatment is recommended when a random sample of leaflets from the planting has an average of 10 motile mites. Leaflets should be examined with a minimum 10x hand lens to determine mite counts.
		hexythiazox, MOA 10A (Savey 50DG)	6 oz	Savey is a preventive miticide that is primarily active against eggs and immatures. Apply when mite populations are low.
		horticultural oils, MOA Unknown (Saf-T-Side) (JMS Stylet Oil)  (Organic JMS Stylet Oil)	1 to 2% by volume 0.75 to 1.5% by volume 0.75 to 1.5% by volume	Summer oils are effective in moderating low mite populations pre-harvest. Use on a trial basis only until certain oil will not result in fruit finish problems. DO NOT use oils within 14 days of using any sulfur-containing material. DO NOT apply oils when temperatures will exceed 90°F or dip below 50°F. Organic JMS Stylet Oil is OMR! listed.

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HARVEST	Botrytis fruit rot	boscalid + pyraclostrobin (Pristine 38 WDG) OR cyprodinil + fludioxonil (Switch 62.5 WG) OR fenhexamid (Elevate 50 WDG) OR iprodione (Rovral 50 WG) (Rovral 4F) OR captan + fenhexamide (CaptEstate) 68WDG	18.5 to 23 oz  11 to 14 oz  1.5 lb  1 to 2 lb 1 to 2 pt  3.5 lb	Include captan in this spray if ripe rot is a problem. Pristine will also control ripe rot. Captan and CaptEstate have a 3-day PHI. Switch and Pristine will control double blossom.	
	Japanese beetles and green June beetles	INSECTICIDE: carbaryl, MOA 1A (Sevin) 50 WP (Sevin) 4 XLR OR malathion, MOA 1B 25 WP zeta-cypermethrin (Mustang Max) MOA 3	2 lb 2 qt  2 lb  4 fl oz	GJB feed on overripe fruit. Regular picking can minimize populations. Do not use Japanese beetle pheromone traps.   Can be applied up to 1 day before harvest. Do not apply more than 0.15 lb AI per acre per season.	
JUST AFTER HARVEST AND 14 DAYS LATER	Leaf spots	FUNGICIDE: captan (Captan) 50W (Captan) 80 WDG	4 lb 2.5 lb		
	Japanese beetle	INSECTICIDE: Same as Harvest			
LATE OCTOBER or EARLY NOVEMBER	Raspberry crown borer	bifenthrin, MOA 3A (Brigade WSB)	16 oz	RCB treatments are most effective when applied in late fall or early spring. Do not treat more than once per year for RCB. Follow label instructions.	
DORMANT	Scale	horticultural oils MOA Unknown (Saf T Side) (JMS Stylet Oil)  (Organic JMS Stylet Oil)	1 to 2% by volume 0.75 to 1.5% by volume 0.75 to 1.5% by volume	Scale insects may be present on caneberries but are typically kept below economically damaging levels by parasitoids and predators. Pruning to maintain an open canopy minimizes scale populations. Examine plants after harvest and during pruning for scale, and if present in high numbers or resulting in sooty mold growth, consider a dormant season oil treatment.	
	Raspberry cane borer			During winter pruning, examine canes for raspberry cane borer injury. Prune canes girdled by raspberry cane borer 2 to 3 cm below the lower girdle. If evidence of boring is present below this cut, successive cuts should be made until no further injury is observed. Destroy or remove cuttings to prevent reinfestaion.	
SPECIAL RUST SPRAYS	Cane and leaf rust, Orange rust	boscalid + pyraclostrobin (Pristine 38 WG) OR myclobutanil (Rally 40 WSP) OR pyraclostrobin (Cabrio 20EG)	18.5 to 23 oz  1.25 to 2.5 oz  14 oz	Begin applications in the spring just before orange rust pustules are formed on the lower leaf of brambles (use wild blackberries as indicators). Continue at 10- to 14-day intervals until the mean temperature remains above 77°F. Infections can also occur in the late summer and fall. Where orange rust has been a problem, alternate Rally and Cabrio or Pristine at 14-day intervals. For late leaf rust, begin when symptoms first appear, and continue on a 14-day interval.	
	SPECIAL TREATMENTS FOR PHYTOPHTHORA ROOT ROT	Phytophthora root rot	mefenoxam (Ridomil Gold EC)	—	Apply 0.25 pt per 1,000 linear ft of row in a 3-ft wide band in the spring and fall after harvest. Ridomil Gold is registered for raspberries only. 45-day phi.
			fosetyl AI (Aliette WSP)	5 lb	Begin when growth is 1 to 3 in. long and continue at 45- to 60-day intervals through the growing season. Registered for blackberries and raspberries. Maximum of four applications per year. 60-day phi.
		phosphorus acid	—	Several phosphorus acid products are registered for control of Phytophthora root rot, including Prophyt and Agri-Fos. See label for recommendations.	
PREPLANT TREATMENTS FOR NEMATODES	Nematodes	1,3 dichloropropene (Telone II)	27 to 35 gal	Preplant interval should be 4 to 8 weeks, or longer if dissipation is slow.	
		metam sodium (Vapam, Sectagon II, Busan 1020)	75 gal	Preplant interval is a minimum of 4 weeks.	