TART CHERRIES

PREBLOOM (WHITE BUD STAGE)

DISEASES	Chemical Efficacy
European brown rot on cultivar meteor[1]	**2e**
Brown rot (American)[2]	See "Bloom"
Bacterial canker	See "Dormant," page **88**

Suggested Chemicals (Rate/acre)

FUNGICIDES

2. Indar 75 WSP (2 oz)

Comments:

European brown rot is a problem on Balaton and Meteor and is occasionally found on Montmorency. To date, European brown rot has been detected only in west central and northwestern Michigan. It is a problem during bloom, when the fungus attacks the flower parts and moves into the spurs. Indar has given significant control in a Michigan test; Rubigan, Nova, Rovral and Bravo gave poor control in the same tests.

[1] Two sprays, at white bud and again at bloom, are needed to control European brown rot.

[2] In most years, spray programs initiated when 10 to 20% of the flowers are open will give economic control of American brown rot. Infection at white bud is rare but may occur where a large number of brown rot-infected fruit are present from the previous season and a prolonged period of warm (above 60° F) wet weather occurs. If these conditions occur in unprotected orchards, use the maximum rate of Indar 24 - 48 hr after the beginning of the wet weather.

INSECTS	
Green fruitworm	**26f, 32e, 34e, 35e, 40e, 46e, 64e, 66e, 73e, 85e, 86e**
Plum nursery mite	**28g**

INSECTICIDES

26. Thiodan 50 WP (3 lb)
28. Vendex 50 WP (1.5 - 3 lb)
32. Lorsban 50 W (2 - 3 lb)
32. Lorsban 75 WG (1.33 - 2 lb)
34. Ambush 25 WP (9.6 oz)
35. Pounce 25 WP (9.6 oz)
40. Asana XL 0.66 EC (4.8 - 14.5 fl oz)
46. SpinTor 2 SC (6 - 8 oz)
64. Entrust 80 WP (2 - 2.5 oz) ▲
66. Warrior 1 CS (3.4 - 5.12 oz)
73. Baythroid XL (1.4 - 2.8 oz)
85. Delegate 25 WG (4.5 - 7 oz)
86. Mustang Max 0.8 EC (4 oz)

BLOOM

DISEASES	Chemical Efficacy
Bacterial canker	See "Dormant," page **88**
European brown rot on cultivar meteor	**2e**
Brown rot (American)	**2e, 3e, 4f-g, 5e, 6g[1], 7e, 8e, 14f[2]**

Suggested Chemicals (Rate/acre)

FUNGICIDES

2. Indar 75 WSP (2 oz)
3. Rovral 50 WP (1 - 2 lb)
4. Bravo 720 (3.125 - 5.5 pt)
5. Nova 40 W (2.5 - 6.0 oz)
6. Vangard 75 WG (5 oz) [1]
7. Orbit 3.6 EC (4 fl oz)
8. Elite 45 WSP (6 oz)
14. Wettable Sulfur 95 WP (15 lb) [2]

Comments:

[1] Do not apply Vangard past bloom in tart cherries.

[2] Flowable sulfur, liquid sulfur and less concentrated wettable sulfur should be used at rates that will give the same amount of sulfur as the 95% wettable powder formulation, except where prohibited by the product label. Because Benlate/Topsin M-resistant brown rot and leaf spot are widespread in Michigan, Topsin M is not recommended for cherries.

Under "Chemical Efficacy": **e** = excellent, **g** = good, **f** = fair, and **p** = poor.
▲ = products listed by the Organic Materials Review Institute (OMRI) for use in organic production.

SWEET CHERRIES

SHUCK SPLIT

DISEASES	Chemical Efficacy
Brown rot	**2e, 4f-g, 5p/n, 8e, 10p/n, 15f, 50p[1], 53f, 70g**
Leaf spot	**2f, 4e, 5f, 8f, 10f, 15p, 50p[1], 53f, 70e, 71e**

Comments:

Do not apply Bravo after shuck split and before harvest. Bravo 82.5% WDG (Bravo Ultrex) formulation may cause phytotoxicity on some varieties such as Gold.

[1] Captan can build up and cause a bacterial spot-like symptom on sweet cherries if multiple applications are used with no rain.

INSECTS	Chemical Efficacy
Plum curculio	See "Petal Fall"; **19g, 59e**
Black cherry aphid	See "Petal Fall"

Suggested Chemicals (Rate/acre)

FUNGICIDES

2. Indar 75 WSP (2 oz)
4. Bravo 6F (4.125 - 5.5 pt)
5. Nova 40 W (5 - 6 oz)
8. Elite 45 WSP (8 oz)
10. Rubigan 1 EC (6 - 12 fl oz)
15. Elevate 50 WDG (1 - 1.5 lb)
50. Captan 50 WP (4 lb)[1]
53. Carbamate 76 WDG (4 lb), plus Wettable Sulfur 95 WP (12 lb)
70. Pristine (10.5 - 14.7 oz)
71. Gem 500 SC (3 - 3.8 fl oz)

INSECTICIDES

19. Provado 1.6 EC (8 fl oz)
59. Actara 25 WG (4.5 - 5.5 oz)

FIRST COVER

DISEASES	Chemical Efficacy
Brown rot	**2e, 5p/n, 8e, 10p/n, 50p, 53f[1], 70g**
Leaf spot	**2f, 5f, 8f, 10f, 50p, 53f[1], 70e, 71e**
Bacterial canker	No chemical controls recommended

Comments:

[1] Flowable sulfur, liquid sulfur and less concentrated wettable sulfur should be used at rates that will give the same amount of sulfur as the 95% wettable powder formulation, except where prohibited by the product label.

INSECTS	
Black cherry aphid	See "Petal Fall," page **101**
Leafrollers	See "Petal Fall," page **101**
Plum curculio	See "Petal Fall," page **101**; "Shuck Split," page **102**
Rose chafer	See "Third Cover," page **103**

Suggested Chemicals (Rate/acre)

FUNGICIDES

2. Indar 75 WSP (2 oz)
5. Nova 40 W (5 - 6 oz)
8. Elite 45 WSP (8 oz)
10. Rubigan 1 EC (6 - 12 fl oz)
50. Captan 50 WP (4 lb)
53. Carbamate 76 WDG (4 lb), plus Wettable sulfur 95 WP* (12 lb)
70. Pristine (10.5 - 14.7 oz)
71. Gem 500 SC (3 - 3.8 fl oz)

Under "Chemical Efficacy": **e** = excellent, **g** = good, **f** = fair, and **p** = poor.
▲ = products listed by the Organic Materials Review Institute (OMRI) for use in organic production.

Nonchemical control options: Plant resistant cultivars; buy disease-free planting material; create open canopies to reduce humidity build-up; plant rows in direction of prevailing wind; prune out and destroy dead canes.

Orange rust – *Arthuriomyces peckianus*

Orange rust is a serious fungal disease that affects all caneberries except red raspberries. The orange rust fungus grows systemically throughout the roots, crown and shoots of an infected plant and is perennial inside the below ground plant parts. Once a plant is infected by orange rust, it is infected for life. Orange rust does not normally kill plants but causes them to be so stunted and weakened that they produce little or no fruit. Symptoms are obvious after new growth appears in the spring. Newly formed shoots are weak and spindly and new leaves are stunted or misshapen and pale green to yellowish. Within a few weeks, the lower surface of infected leaves is covered with blister like pustules that are waxy at first but soon turn powdery and bright orange. Rusted leaves wither and drop in late spring or early summer. In late spring, aeciospores from the pustules on infected leaves are carried by wind and rain to healthy susceptible leaves, which they infect. Secondary spores from these infections penetrate leaf buds. The fungus overwinters within the roots and crown of the host. Orange rust is favored by low temperatures and high humidity. Temperatures from 43 - 72° F favor disease development. Aeciospores require long periods of leaf wetness for germination and infection.

Nonchemical control options: Plant resistant cultivars; buy disease-free planting material; create open canopies to reduce humidity build-up; plant rows in direction of prevailing wind; remove and destroy infected plants.

Late leaf rust – *Pucciniastrum americanum*

Late leaf rust is a minor fungal disease that occasionally causes economic losses on red raspberries. It usually occurs late in the season. Small, rather inconspicuous chlorotic or yellow spots may form on the upper leaf surface. Small pustules filled with yellowish powdery spores are formed on the undersides of infected leaves and may also occur on leaf petioles, canes, and even on the fruit. These spores are capable of causing new infections throughout the growing season. Infected fruit are worthless, thus yield of marketable fruit is reduced. Badly infected leaves may drop prematurely, and in years when the disease is severe, canes may be defoliated by September. The late leaf rust fungus is not systemic. While spores from raspberries infect white spruce (the alternate host), it apparently does not need the alternate host to complete its lifecycle and can overwinter on infected raspberry canes. The following season, spores produced on the canes can cause new infections.

Nonchemical control options: Plant resistant cultivars; buy disease-free planting material; create open canopies to reduce humidity build-up; plant rows in direction of prevailing wind.

Powdery mildew – *Sphaerotheca macularis*

Powdery mildew is a fungal disease that affects susceptible raspberry cultivars but not blackberries or hybrids. Severely infected plants may be stunted and less productive. Infected fruit may be lower in quality or unmarketable as a result of the unsightly covering of mycelial growth. Infected leaves develop light green blotches on the upper surface. Generally, the lower surface of the leaf directly beneath these spots becomes covered by white, mycelial growth. Infected leaves are often mottled, resembling a mosaic virus. When severely infected, the shoots become long and spindly with curled, dwarfed leaves. The fungus overwinters as mycelium in buds on shoot tips. Airborne conidia are abundantly produced on the surface of infected tissue and cause repeated infections throughout the season. The development of this disease is favored by warm weather and moderate to high humidity.

Nonchemical control options: Plant resistant cultivars; buy disease-free planting material; create open canopies to reduce humidity build-up; plant rows in direction of prevailing wind; remove and destroy heavily infected canes.

Botrytis gray mold – *Botrytis cinerea*

Gray mold is a serious fungal fruit rot disease of raspberries and blackberries and also causes blasting of blossoms. Fruit infections usually don't show up until harvest and appear as soft, light brown, rapidly enlarging areas on the berries. Infected berries become covered with a gray, fluffy growth of the fungus and can infect neighboring healthy berries through contact. Picked berries are extremely susceptible to infection, especially if bruised. Handling of infected fruit during picking may also spread the fungus to healthy berries, which can develop into a rotted mass within 48 hours. The gray mold fungus overwinters on infected dead raspberry leaves and canes. In early spring, it produces large numbers of airborne spores. When moisture is present, the spores germinate and infect susceptible tissues within a few hours. The fungus usually enters the fruit through flower parts, where it remains latent until the fruit ripens. However, a lot of infections also take place on ripe and overripe fruit. Temperatures of 70 - 80° F and wetness from rain, dew, or irrigation are ideal for disease development. The disease can develop at lower temperatures if foliage remains wet for long periods.

Nonchemical control options: Plant resistant cultivars; create open canopies to reduce humidity build-up; plant rows in direction of prevailing wind; harvest frequently; avoid handling infected fruit while picking; avoid bruising of the fruit; cool down fruit rapidly after harvest.