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EC63-1806 Cedar Apple Rust

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Cedar Apple Rust

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Spring rains cause gelatinous tendrils to emerge from the galls on cedar. Spores are released from the tendrils which can cause infection of apple leaves. The infected apple leaves in turn release spores in the summer that cause infection of cedar.

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CEDAR APPLE RUST

John L. Weihing and Wayne C. Whitney 1/

Cedar apple rust is one of the most conspicuous tree diseases in Nebraska. Both the cedar and the apple are necessary for the survival of the fungus parasite which causes this disease. Rust also affects species of trees related to apple such as crab apple, hawthorne, red haw, and quince. The symptoms produced on cedars are so different from those on apple that one might never suspect that the same organism caused both.

SYMPTOMS ON CEDARS

In the spring, following a rain, bright orange-colored gelatinous horns come out of galls on the branches of cedar. On some trees hundreds of these galls may be counted, while others may have but a few. The galls vary in size. Some are no larger than a pea, while others may grow to 2 inches in diameter (Figures 1 and 2). Usually the rust does not seriously damage the cedar unless the infection is very heavy or is serious for several successive years.

SYMPTOMS ON APPLE TREES

Leaves, fruits and occasionally twigs are attacked. During June and July yellow to orange-colored spots develop on the surfaces of the leaves (Figure 3). On the lower surface of the leaf, many small cup-shaped bodies are produced immediately below the colored spots. The cup-shaped bodies are arranged in a ring, giving a crown-like appearance. When the leaves are badly infected they turn yellow and premature defoliation occurs. This weakens the tree, reduces the size of the fruits of the current crop and reduces the number of fruits the following year.

1/ Extension Plant Pathologist and Extension Horticulturist, respectively.

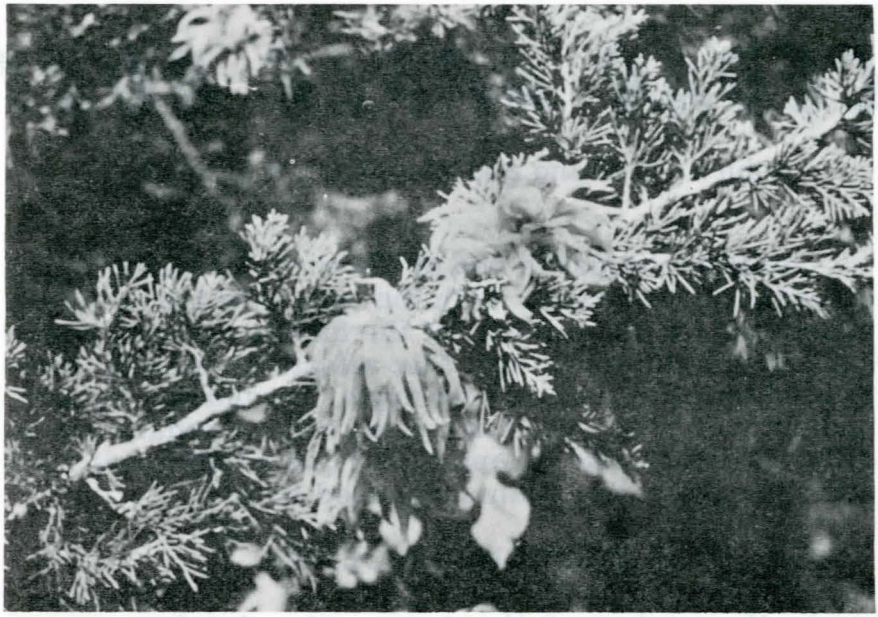

Figure 1. Mature cedar apple galls of various sizes from which have emerged gelatinous, orange tendrils following a spring rain.

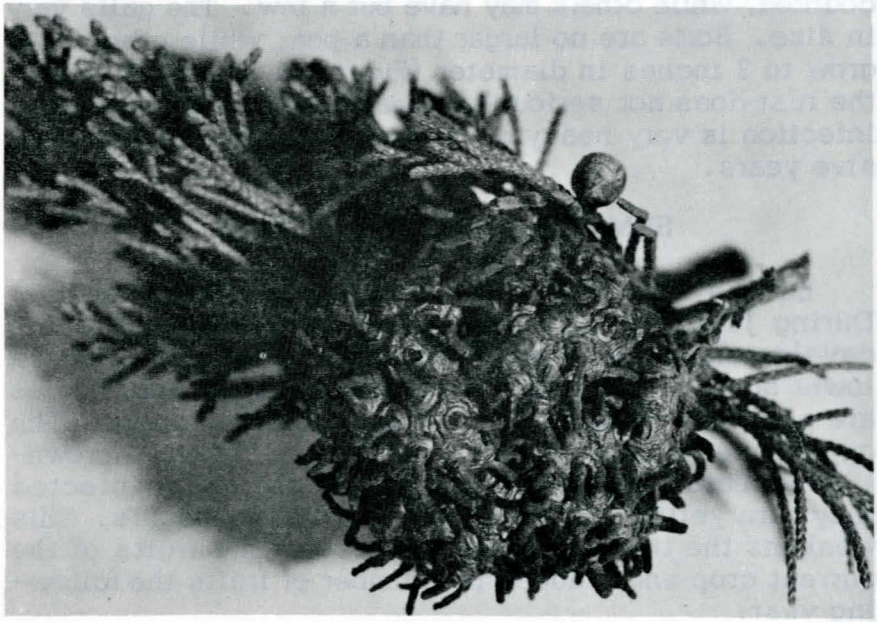

Figure 2. Mature cedar apple rust galls on cedar. Following a spring rain, long, orange, gelatinous tendrils will emerge from the circular indentations on the gall.

Figure 3. Cedar apple rust on apple leaves. The spots are bright yellow to orange in color.

The crown-like ring of cup-shaped structures may also occur on the fruits and mar their shape and appearance. While rust itself does not cause a rot in storage, the injuries on the fruit may serve as entranceways for rot-producing organisms.

On twigs of the very susceptible varieties, rust occasionally forms elongated, swollen cankers which may girdle the twigs.

LIFE HISTORY OF THE FUNGUS

The fungus Gymnosporangium juniperi-virginianae is responsible for the cedar apple rust disease. Infection causes the formation of galls on cedar. Spores (fungus seed) develop within these galls. The spores are carried to the outside by the long, gelatinous orange tendrils that emerge following a spring rain. They germinate and produce another kind of spore which is shot into the air to be carried away. These airborne spores from cedar can cause infection only on apple and do so when they by chance lodge upon an apple tree.

The spores that are produced in the infection spots formed on apple can cause infection on cedar but not on apple. These spores are also airborne. When they lodge on a cedar needle they can germinate and send germ tubes down into the leaf tissue, setting up an infection. This occurs in the summer. The first visible signs of infection on cedar do not show up until July of the following year at which time tiny, soft woody galls begin to appear. These galls increase in size until October. The following spring after the galls have produced the spore-bearing tendrils, they usually die. Thus, it takes the cedar apple rust fungus two years to complete its life cycle.

In cities and towns where cedars are commonly used as ornamentals and the apple is grown extensively as a home fruit, infection may become so severe as to kill one or the other. Cedar and apple trees growing 1 mile apart seldom, if ever, show reciprocal infection, but under favorable circumstances the airborne spores may sometimes be carried for several miles.

CONTROL

The best way to control cedar apple rust is to avoid planting susceptible cedar and apple near each other. If cedars are desired near susceptible varieties of apples, then a resistant or immune type such as varieties of the Chinese juniper should be planted. If apples are wanted near the susceptible planting, only the most highly resistant varieties should be selected.

Fungicidal sprays are also used for protection against the disease as well as for eradication of cedar apple rust.

CONTROL ON CEDAR

1. Plant the resistant varieties. Chinese juniper (Juniper chinensis) is immune to the disease.

Avoid the susceptible red cedar (Juniperus virginiana) and most of its varieties: Rocky Mountain or Colorado cedar (Juniperus scopulorum) and its varieties and the Bermuda juniper (Juniperus barbadensis).

2. Use of fungicidal sprays. Protective sprays: As a protection against infection, spray the cedars with wet-

table sulfur (1 pound to 10 gallons of water) at three to four week intervals during July, August, and September. This spray would also control red spider, which is a very serious pest of cedar.

Zineb or Ferbam could be used in place of wettable sulfur, but neither will control red spider.

Eradicant sprays: The fungicide Acti-spray is sold as 380 milligram tablets. This fungicide does an excellent job in killing the galls. Spray the tree in the early spring before the galls are active with Acti-spray at the rate of 1-380 milligram tablet per 2 gallons of water. Be certain to soak the galls.

CONTROL ON APPLE

1. Plant the resistant varieties.

Very resistant are:

Delicious (Red type)	Northwestern Greening
Early McIntosh	Sharon

Resistant:

Cortland	Turley
Duchess	Winesap
Golden Delicious	Yellow Transparent
Haralson	York
King David	

Avoid the susceptible:

Grimes	Secor

and very susceptible:

Beacon	Minjon
Jonathan	Wealthy

2. Use of fungicidal sprays. Spray the apple trees with ferbam (2 lbs. per 100 gals. of water or 5 table-spoons per 3 gals. of water) or wettable sulfur (4 lbs. per 100 gals. of water or 4 tablespoons per 3 gals. of water) three to five times in the spring before and during the period when the tendrils have emerged on the cedar galls.

Since many other pests attack apple trees it is desirable to carry out a complete spray schedule. Therefore it is suggested that E. C. 62-1589, Home Fruit spray schedules, be consulted.