The Plant Doctor's LANDSCAPE TIPS

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CEDAR-APPLE RUST

Photo 1: Yellow spots initiated by the Cedar-Apple Rust fungus on the deciduous host is usually the most obvious symptom seen by the public. Please note in this photo that the fruit is also infected.

Photo 2: Perhaps not often noticed on the cedar/juniper host plants are these rather inconspicuous galls. Typical galls may be much smaller than the one evident in this picture.

Photo 3: During warm rainy weather in the spring, the gall in Photo 2 produces these gelatinous tendrils that produce spores that infect and cause the yellowish-orange spots on the alternate deciduous host, as seen in Photo 1.

INTRODUCTION:

Cedar-Apple Rust is a plant disease caused by the fungus, Gymnosporangium juniperi-virginianae (for those fungophiles, Gymnosporangium is a basidiomycete).Two similar but related rust diseases are often confused with cedar-apple rust: Cedar-Hawthorne Rust caused by Gymnosporangium globosum, and Cedar-Quince Rust caused by Gymnosporangium calvipes. Often used loosely, Cedar-Apple Rust is actually a complex of diseases caused by three different fungi, herein referred to as the Cedar-Apple Rust Complex.

Compared to many other diseases, the Cedar-Apple Rust Complex is rather unique in the pathology world of plants. The fungi that cause these diseases have evolved in such a manner that two different host plants, a deciduous and a conifer host, are required for the pathogen to complete its life/disease cycle. The conifer hosts generally consist of many species and cultivars belonging to the plant genus, Juniperus. These include Eastern and Western red cedars, and Horizontal and Savin junipers. The deciduous hosts include the obvious namesake of the disease. For example, Cedar-Apple Rust infects apples and crabapples, Cedar-Hawthorn Rust infects Hawthorn, and Cedar-Quince Rust infects Quince. The Cedar-Hawthorn and Cedar-Quince Rusts can also infect mountain ash, pear and serviceberry. The Cedar-Quince rust fungus can also attack chokecherry, cotoneaster, photinia and other types of quinces such as dwarf Japanese quince.

SYMPTOMS AND DISEASE CYCLE:

The most obvious symptom recognized by the public and professional alike is the development of yellow spots on the foliage of the deciduous hosts (Photo 1). These yellow spots develop from infections that took place in the early spring during damp weather, which is necessary for spore germination and infection. Less commonly observed because they are somewhat inconspicuous during most of the year are "cedar rust" galls on the Juniperus host (Photo 2). These fungal-incited galls are rather inconspicuous because they may resemble cones or because they blend in with the "evergreen" foliage. During the rainy weather in the spring, however, these previously inconspicuous galls become very conspicuous as gelatinous tendrils are produced (Photo 3). Once these gelatinous galls are observed, people have been reported to run in fear to escape an alien invasion. These gelatinous tendrils produce and release the spores that will shortly cause the yellow spots to develop on the deciduous host (Photo 1), usually in May. Lesions from these infections may also develop on fruit and twigs. As the season progresses into late summer and fall, rotation of the yellow-spotted leaves will reveal small tendrils emerging from the underside of the leaf, directly below the yellow spot (Photo 4). The tendrils may also develop from fruit and twig lesions. Infected foliage often drops prematurely in August, sometimes promoted by drought. These small tendrils produce the spores that will cause infection and eventual gall development on the conifer host, Juniperus (Photo 2). Galls or swellings on junipers are visible the following spring but may take another season (to the following spring) before they mature sufficiently to produce the gelatinous horns (Photo 3) that release spores to infect the deciduous host.

It may be difficult to distinguish among the various rust diseases on their deciduous and conifer hosts. The galls of Cedar-Apple Rust often reach over 2 inches in

Photo 4: In August and September, if the leaves with the yellow spots are rotated, small tube-like tendrils are seen on the underside of the deciduous host leaf, in this case, hawthorn. The tendrils produce spores that infect the coniferous host.

Photo 5: These galls on scotch pine, western and eastern galls rust, are produced by another rust fungus but are unrelated to the Cedar-Apple Rust complex.

diameter on Juniper while the galls of Cedar-Hawthorn Rust seldom attain over ½ inches in diameter. The galls of Cedar-Hawthorn Rust may produce spores for 4 or 5 seasons while Cedar-Apple Rust galls only produce spores for one year. Cedar-Quince Rust galls form elongated swellings on the twigs and branches of Junipers; these perennial swellings may crack and cause cankers. These cankers may kill twigs and branches and hence are particularly serious for landscape trees.

MANAGING CEDAR-APPLE RUST COMPLEX:

Managing Cedar-Apple Rust can be challenging, particularly if zero tolerance is expected. In some fruit-growing regions of some states, the alternate host (juniper, cedar) is legally removed from landscapes and natural areas to protect valuable fruit crops. In many situations, where some tolerance is the norm, nothing needs to be done; the Cedar-Apple Rust complex is rarely serious or lethal to plants. The disease might even be viewed as an interesting anomaly of nature. Where less tolerance is accepted, separating the conifer hosts from the deciduous host is a practical solution; in general, 1,000 feet of separation is a good rule of the green thumb. This level of separation will probably not eliminate Cedar-Deciduous Rust infections but will greatly minimize them. Another option is to employ genetic resistance: replace the preferred host or less preferred host plant with a resistant host plant. There are actually quite a few species, both in the Rosacea family (apple, crabapples, etc.) and the conifer group, that are resistant or tolerant to the Cedar-Apple Rust complex of diseases. Where physical activity is not shunned, pruning galls from the conifer host before they release spores in the early spring may be practical (or impractical) depending on the situation, size and population of the junipers and cedars. Other rust galls may be observed in the landscape on other conifers but are unrelated to the Cedar-Apple Rust complex (Photo 5). As a final management tool, fungicide sprays applied at the proper time (spring) to the deciduous host can effectively break the disease cycle. Usually, a registered fungicide is applied at bud break or early blossom and repeated every 10–14 days (depending on weather) for one month and is fairly effective. Sometimes, one application of a highly effective fungicide is sufficient.

For more information, please feel free to email David Roberts at robertsd@msu.edu or contact a professional plant health care provider. The author, MSU and MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.

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