The Plant Doctor's LANDSCAPE TIPS

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TRELLIS RUST: AN UPDATE

INTRODUCTION:

Trellis Rust (aka European Pear Rust) is caused by the fungus Gymnosporangium sabinae (= Gymnosprangium fuscan), a relatively newly introduced fungus in North America. At this time it is believed that Trellis Rust (TR) is only capable of attacking Pear (Pyrus sp.) but can cause extensive harm to both orchard producing pears (Pyrus communis) and landscape ornamental pears (Pyrus calleryana). Last year, I published an article on TR in the September issue (Pgs 14 & 15) of the Landsculptor. In the intervening year further revelations about the disease have been uncovered. Hence, I thought it would be appropriate to pass these findings on to the Landscape Industry.

OBSERVATIONS:

Following are some rather new observations made about TR during the latter part of 2014 and 2015.

Pear Decline: During 2014, TR was observed not only infecting the leaves but also the twigs of pear (Photo 1). While leaf infections may cause defoliation, twig infections can have dire consequences for pear trees. Twig infections can lead to branch death, which if severe can lead to tree decline. Branch death is likely to make many ornamental pear trees undesirable in many landscapes (Photo 2). On a TR site near Livonia, Michigan, many twigs and branches died either directly from TR infections or as conjoining consequences with winter injury.

Prevailing Winds & Dissemination: Theoretically, the spores of fungal pathogens can be wind-disseminated for miles. TR is no exception. Obviously wind direction can change, but the spores of TR are likely to be disseminated down wind, with prevailing winds. The greater the distance of the host plant from the source of infection, the less incidence of infection. This is essentially a "dilution effect." Nevertheless, infections can occur "against" the prevailing winds (Photo 3)

Photo 1: One of the devastating aspects of Trellis Rust is its ability to infect twigs of pear trees.

Photo 2: Due to severe infections from close proximity of juniper hosts, these pear trees have declined to such an extent in two seasons to become non-viable and unacceptable as landscape trees (Photo taken July 20, 2015).

Photo 3: This row of pear trees only about 100-200 yards upwind (against prevailing winds) from the juniper hosts at this Livonia location initially appear fine. Nevertheless, TR is building up on these trees (Insert).

Juniper Galls: During my observations in 2014, very few "rust" galls were found on the juniper host plants, and I wondered how the fungus could be so prolific to cause so many infections on pear leaves. Because Mark Baldwin was frequently monitoring the Livonia TR site, we were able to document the emergence of the telio-horns and accompanying release of the teiliospores that are destined to infect the pear leaves.

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We were truly astonished at how many "telial horns" emerged from areas on juniper stems that exhibited no conspicuous galls (Photo 4). Compared to many other native rust galls, these small galls would have been largely inconspicuous during the winter and early spring, making their removal as a management practice virtually impossible.

Trellis Rust is Spreading: While not performing any formal survey, my casual observations during 2015 reveals that TR is fairly widespread throughout southeast Michigan (Photos 5A-5D). Having first been detected in Michigan in 2009, the disease seems to be spreading at a rather alarming rate. I am concerned that TR may become a limiting factor of pear as a viable landscape tree as the disease continues to build in prominence over the coming years.

Photo 4: Thanks to Mark Baldwin's vigilance, I was able to capture the emergence of telio-horns, which released teliospores that are wind-blown to the deciduous pear host. Photo was taken on May 6 and may provide a general guideline for timing of certain management strategies. "The juniper gall" that these telial horns emerged from was not conspicuous in its dormant state.

MANAGEMENT STRATEGIES:

Trellis Rust (TR) is considered a macrocyclic rust disease because it requires two host plants to complete its life/disease cycle and because it produces all of the spore types associated with macrocyclic rust diseases. Knowing that it is a macrocyclic disease can be beneficial in managing it. There are a number of management strategies that have potential to be fairly effective for macrocyclic rust diseases such as Trellis Rust. Following are some recommendations.

Forget the Juniper Galls: Rust galls on many juniper hosts infected by native rust diseases are rather large and conspicuous. Removal of these galls is an acceptable practice of control. While some of the juniper galls of TR are conspicuous, most are not (Photo 4) and only become conspicuous when they swell in the spring and early summer. Hence, sanitation measures of removing the causal agent/source of infection (juniper galls) is not pragmatic with Trellis Rust.

Separation Anxiety: Because we know that serious rust infections usually occur with close proximity of susceptible alternate plants to infection sources, a primary management method would be to keep infections at a low incidence by separation of plants. Separation causes a wind-dilution of infective spores. Pears may tolerate a substantial infection rate while exhibiting few outward symptoms of the disease (Photo 3) . . . at least from a distance. There's a new adage with TR: the greater the distance, the greater the dilution of infective spores, the fewer number of infections on desirable plants. Due to the seriousness of TR, many landscapes should not be planted with both junipers and pears. Obviously, nearby landscapes containing the alternated host of TR might cause some neighborhood scuffles. While all pear varieties appear to be susceptible, the primary conifer hosts may not be well understood except that those cultivars associated with Juniperus virginiana (including Savin) are prime hosts. Separation of susceptible host plants probably provides the most pragmatic approach to thwart Trellis Rust.

Fungicides: Application of broad spectrum fungicide sprays or perhaps trunk injections of fungicides might provide relief for TR infections on high value pear trees. The fungicide must be present before spore dispersal from junipers to pears. In regards to foliar sprays, the most efficacious treatments will be those applied to the pear foliage slightly before the emergence of the "telial horns" on the juniper (Photo 4).

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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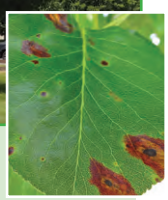
Photos 5A-5D: "An Invasive' s Journey" (All photos were taken at same location over a 13 year period)

Photos 5A: Fall of 2002: Attack of a monoculture of ash trees by the Emerald Ash Borer.

Photos 5C: Summer 2005: Monoculture of Bradford Pear Established.

Photos 5B: Spring of 2003: Rapid decline of ash trees by the Emerald Ash Borer in one year.



Photos 5D: Summer Of 2015: All Pears show signs of Trellis Rust infections (see Insert).