

Disease-Resistant Trees and Shrubs



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Classically defined, a disease-resistant plant is one that inherently or naturally resists infection from ubiquitous fungal, viral and bacterial agents. In most scenarios, two related plants, side by side, react differently to the infection; one develops lesions, degraded cambial tissues or rotten roots, while the other is either completely or almost completely unaffected. Crabapple trees infected with cedar apple rust or apple scab typify this group of plants. In other cases, a plant may be slightly infected with a disease, yet show no reduction in overall health, and the infection locations are merely an aesthetic distraction. Cedar trees infected with cedar apple rust are in this category.

When you examine the causes of pathogenic diseases carefully, three factors must be in place in the right proportion to cause infection. The classic disease triangle explains this well. One angle of the triangle represents the pathogen itself, and another is the weather conditions necessary for the growth and development of the fungus, virus or bacteria on or in the plant.

The third piece of the triangle is the host plant; it may be able to facilitate infection or may be resistant. The reason that this illustration is a triangle is that all three parts must be satisfied for infection to occur. If one of the three is not viable, then the tree or shrub does not become infected with the disease. For example, sycamore anthracnose is a common foliar disease that is favored by cool, wet springtime conditions. The tree is reasonably susceptible (host), previous areas of infection or cankers are the source infections (pathogen) that may be present on the tree or nearby trees and cool, wet springs (weather) create moist leaf conditions for the fungus to grow.



Cankers are common diseases of poplar, cottonwood and honeylocust.
PHOTO: JOHN WATKINS

Disease-resistant vs. disease-susceptible plants

There are certain woody species that simply aren't bothered by many pathogens. Red oak and ginkgo are examples. Sure, from time to time, oak wilt, powdery mildew and leaf spots have been observed, but for the most part, these are tree species that don't seem to be good hosts for disease infections.

On the other hand, certain species are known for regular bouts with fungal or bacterial diseases. Poplars, lilacs and cockspur hawthorns routinely develop diseases such as cytospora canker, cedar hawthorn rust and bacterial shoot blight. Whether the tree or shrub species is well-known as a resistant or susceptible plant, it's wise to know so that it can be minimized or considered for addition to the landscape.

Disease-resistant cultivars

The majority of plant species are a mixed bag; their cultivars are either disease susceptible, intermediate or mostly resistant. A good site to see examples of this is at an All America Rose Selection (AARS) garden. AARS gardens evaluate dozens, sometimes hundreds, of cultivars each year. The rose judges that conduct the evaluations score the individual cultivars on many factors (hardiness, form, novelty, fragrance, etc.), including disease resistance to several pathogens. Rust, black spot and anthracnose are some of the common diseases that are noted. Visiting these gardens, or at least visiting their Web site and looking at the cultivar ratings for diseases, can be quite helpful when it comes to choosing cultivars for your customers. Check out test sites near you at www.rose.org.



Over 100 botanic gardens and public demonstration sites like this one in El Cajon, Calif., exist in the U.S. At these sites you can gather crucial plant selection information, such as which species are resistant to certain diseases in the area. PHOTO: JOHN C. FECH

Initial cost consideration

When choosing plants for a landscape installation, differences in price may be evident. As you examine the choices, you'll likely see some with varying degrees of resistance. Money saved on the initial investment will be greatly overshadowed by the expense of maintaining disease susceptible plant material, even in the first year. In addition, the customer's satisfaction in being able to have healthy plants in their landscape without regular fungicide applications is worth a lot.

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Site assessment/analysis

The key to helping your clients create a healthy and sustainable landscape is performing a site assessment and analysis to determine the status of the level of disease susceptibility amongst the various species in their landscapes.

The difference between a site assessment and a site analysis is simple. A site assessment is a documentation of the status of each plant in the landscape, as well as the observed growing conditions for them. In short, it's the raw information. A site analysis is conducted after an assessment, taking the observations and assigning a diagnosis, value judgment or recommendation to them.

Here's how it works: Step one is to walk the property with a clipboard, sketching in the various hardscape pieces and plants. As each plant is encountered, notes such as "spots on leaves," "gash in trunk" and "stunted current season's growth" are written on the sketch. Step two is to determine the cause and seriousness of each noted concern. For example, a tree might be struggling because the neighbor's sprinkler system runs for an hour and a half every morning regardless of natural rainfall. Thus, "pale leaves and stunted growth" could translate into a recommendation for an audit of the sprinkler system (which you could provide casually as an addendum). It's also possible that weather conditions have led to the infection of common pathogens such as apple scab and anthracnose, and a treatment program to address it may be necessary.



Closeup inspection of leaf surfaces will help reveal if a real disease problem exists. PHOTO BY JAMES KALISCH, UNL.

Information sources

Regional differences are important. This was made crystal clear to me while presenting a seminar on sustainable landscaping to a national audience a few years back. I was making the point that tea roses are high-maintenance plants and should be avoided at all costs. An attendee from California raised his hand and took issue with my assertion, reporting that on his facility, tea roses were almost completely trouble-free. In fact, it was one of the easiest plants to care for on the whole property. A few others in the audience agreed. The bottom line to this lesson is that local sources of plant selection information are best, as regional differences are key in terms of disease susceptibility or resistance.

As mentioned earlier with rose trials, visiting local woody plant evaluation or demonstration sites is a good way to see firsthand how well certain plants perform under conditions similar to those of your customers. As I've traveled around, I've visited many locations, (as well as several in Europe) and found each of them to be helpful in providing localized plant selection information. I highly recommend that you investigate local demonstration sites to gather crucial plant selection information. This can be as simple as a web search or as involved as a drive and half-day visit. Either way, it's well worth the investment of time and effort.