Resistant Cultivars Offer "Built-In" Protection from Azalea Lace Bugs

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Azalea lace bugs are a major pest of azaleas in both production nurseries and in the home landscape. Adult lace bugs feed on leaves using piercing mouthparts to suck juices from the undersides of the leaves. Lace bug feeding damage results in a chlorotic stippling of the upper and lower leaf surface that diminishes photosynthetic ability of plants (1) and gives the plants a yellowish cast. Severe infestations can lead to reduced plant vigor and eventual loss of leaves. Azalea lace bugs are a fact of life for the home gardener in both northern and southern landscapes.

At the USDA-ARS Thad Cochran Horticultural Research Laboratory in Poplarville, Mississippi, I am evaluating cultivars of azaleas for resistance to lace bug feeding. Host plant resistance is an environmentally friendly, low-tech, low-cost method of control that reduces the need for pesticides to manage azalea lace bugs. In a recent study, we evaluated 33 commercially available cultivars for feeding preference by azalea lace bugs. The number of eggs was used as an indicator of egg laying preference, and feeding preference was measured by counting lace bug feces. These studies were conducted under tightly controlled laboratory conditions to eliminate environmental bias. A full description of experiments can be found in the December 2008 issue of the journal *HortScience*. (2) The rankings presented in this article are pooled results from choice and no-choice bioassays.

Selected Cultivars

Due to their current popularity, 19 of the Encore® Azalea Autumn series evergreen azaleas were evaluated in addition to 14 standard cultivars. The Encore® Azalea Autumn series plants have been featured in *Southern Living* magazine and are popular to homeowners because of their long lived blooms. The male seed parent of these plants, *Rhododendron oldhamii*, originated in Taiwan and was introduced into the United States in 1973 and exhibits excellent resistance to azalea lace bug. However, this plant is not cold hardy and is difficult to propagate; thus it has never been put into large-scale production. The remaining 14 cultivars selected were standard cultivars routinely seen in southeastern landscapes. The results of our laboratory experiments helped categorize each of the 33 cultivars as:

Resistant—Cultivars least preferred by azalea lace bugs; having the lowest mean values for feces and eggs.

Moderately Resistant/Moderately Susceptible—Cultivars with more eggs and feces on leaves than the resistant cultivars, but still with lower values than the remaining cultivars.

Susceptible—Cultivars with the most feces and eggs present on their leaves.

Rankings

Resistant Cultivars

Description of azalea cultivars following rankings are based on classification presented by Galle (3). Several cultivars were found to be resistant to lace bugs within the

▼ Azalea lace bug feeding on a leaf.

Photo Dr. David W. Boyd, Jr.

▼ Lace bug damage on the upper surface of an azalea leaf.

Photo Grant Kirker

Figure 1—Azalea Lace Bug Resistant Cultivars


Photo Grant Kirker

▲ 'Fourth of July'


Photo Tijs Huisman

▲ 'Koromo-shikbu'


Photo Corrina S. Murray

▲ Autumn Amethyst™


Photo Corrina S. Murray

▲ Autumn Twist™


Photo Corrina S. Murray

▲ Autumn Royalty™


Photo Corrina S. Murray

▲ Autumn Sangria™


Photo Corrina S. Murray

▲ Autumn Cheer™


Photo Corrina S. Murray

▲ Autumn Rouge™


Photo Dr. David W. Boyd, Jr.

▲ 'Gumpo White'

Encore® Azalea series: Autumn Amethyst™, Autumn Twist™, Autumn Royalty™, Autumn Sangria™, Autumn Cheer™, and Autumn Rouge™. Autumn Twist™ and Autumn Sangria™ were selected branch sports of Autumn Royalty™ so we would expect similar non-preference by azalea lace bugs.

Other cultivars showing resistance to azalea lace bugs were: 'Koromo-shikibu' and 'Gumpo White'. 'Koromo-shikbu' (*R. stenopetalum* 'Linearifolium') with a lavender split-petal flower. 'Gumpo White' is in the Tsutsuji series and has white blooms. The hardened stems of this azalea are brittle and are easily damaged during shipment, which is why many nurseries that ship plants no longer grow it.

Figure 1 shows the resistant cultivars ranked left to right from highest (lower number of lace bugs eggs/feces) to lowest (higher number of lace bug eggs/feces). We are focusing future research on characteristics of these resistant plants at both the microscopic level and using chemical analyses of leaf compounds in order to explain why lace bugs are less prevalent on their foliage.

Moderately Resistant

We observed moderate levels of resistance in the following plants in the Encore® Azalea series: Autumn Embers™, Autumn Bravo™, Autumn Starlite™, Autumn Ruby™, and Autumn Princess™. The cultivars 'Amagasa', 'Hinodegiri', 'Formosum', and 'Mrs. G.G. Gerbing' were also moderately resistant to azalea lace bug. 'Amagasa' is a cultivar belonging to the Satsuki series with red-orange blooms. 'Hinodegiri' is a Kurume hybrid with red-orange blooms. 'Formosum' is a tall upright Southern Indian hybrid of 'Phoeniceum' with purplish red blooms. 'Mrs. G.G. Gerbing' (also in the Southern Indian series) is a branch sport of the cultivar 'George Lindley Taber' and has white blooms. The ranked moderately resistant cultivars are presented in order from most moderately resistant (lower number of lace bug eggs/feces) to least moderately resistant (higher number of lace bug eggs/feces) in Figure 2.

Moderately Susceptible

In the Encore® Azalea series, the cultivars Autumn Monarch™, Autumn Empress™, Autumn Coral™, Autumn Carnival™, and Autumn Sunset™ were moderately susceptible to azalea lace bug. The standard cultivars 'Midnight Flare', 'Delaware Valley White', and 'Sunglow' were moderately susceptible to azalea lace bugs. 'Midnight Flare' is a Harris hybrid with reddish-pink blooms.

'Delaware Valley White' is a 'Mucronatum' hybrid in the Southern Indian series. Prior research (4, 5) had also determined that 'Delaware Valley White' is susceptible to azalea lace bug. 'Sunglow' is a tall upright Carla hybrid and has reddish-orange blooms. The moderately susceptible cultivars are presented in order from least moderately susceptible (lower number of eggs/feces) to most moderately susceptible (higher number of eggs/feces) in Figure 3.

Susceptible

In the Encore® Azalea series, the cultivars Autumn Sweetheart™ and Autumn Debutante™ were susceptible to lace bug damage. Both of these plants have 'Watchet' in their parentage, which was also susceptible. 'Red Slippers' is a Back Acres hybrid with pink flowers. 'Kelly Marie' is a Tom Dodd hybrid of the cold-hardy Korean Azalea (*R. yedoense* var. *poukhanense*) with pink flowers. 'Fashion'

Figure 2—Azalea Lace Bug Moderately Resistant Cultivars


Photo Corrina S. Murray
▲ Autumn Embers™


Photo Camp Hill Azaleas
▲ Autumn Bravo™


Photo Corrina S. Murray
▲ Autumn Starlight™


Photo Corrina S. Murray
▲ Autumn Ruby™


Photo Dr. David W. Boyd, Jr.
▲ 'Amagasa'


Photo Corrina S. Murray
▲ 'Hinodegiri'


Photo Grant Kirker
▲ 'Formosum'


Photo Corrina S. Murray
▲ Autumn Princess™


Photo Jack Scheper
▲ 'Mrs. G.G. Gerbing'

is a Glenn Dale hybrid with red-orange flowers with some darker stippling down the throat. 'Watchet', mentioned previously, is a Robin Hill hybrid originally developed by Robert Gartrell. It has ruffled pink flowers and a greenish white throat. The susceptible cultivars are presented in order from least susceptible (lower number of lace bug eggs/feces) to most susceptible (higher number of lace bug eggs/feces) in Figure 4.

Conclusion

Now that we have determined which cultivars are resistant and susceptible, we can start looking at the physiologi-

Figure 3—Azalea Lace Bug Moderately Susceptible Cultivars


Photo Martin Davis
▲ 'Midnight Flare'


Photo Corrina S. Murray
▲ Autumn Monarch™


Photo Dr. David W. Boyd, Jr.
▲ 'Delaware Valley White'


Photo Corrina S. Murray
▲ Autumn Empress™


Photo Corrina S. Murray
▲ Autumn Coral™


Photo Grant Kirker
▲ 'Sunglow'


Photo Corrina S. Murray
▲ Autumn Carnival™


Photo Corrina S. Murray
▲ Autumn Sunset™

Figure 4—Azalea Lace Bug Susceptible Cultivars


Photo David McManus

▲ 'Red Slippers'


Photo Corrina S. Murray

▲ Autumn Sweetheart™


Photo Dr. David W. Boyd, Jr.

▲ 'Kelly Marie'


Photo Grant Kirker

▲ 'Fashion'


Photo Grant Kirker

▲ 'Watchet'


Photo Corrina S. Murray

▲ Autumn Angel™


Photo Corrina S. Murray

▲ Autumn Debutante™

cal, chemical, and possibly even genetic differences between these plants in order to determine which of these factors contribute to the preference or non-preference by azalea lace bugs. With a better understanding of these processes, we could also attempt to transfer some of the resistance seen in certain cultivars to susceptible ones through breeding. This would allow azalea enthusiasts to maintain diverse collections of pest-free cultivars that can be attractive to both insects and humans.

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References

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