

## Unraveling the Rose Rosette Puzzle<sup>©</sup>

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### INTRODUCTION

Rose rosette is currently the major plant disease of the rose in the world. A virus disease vectored by an eriophyid mite, *Phyllocoptes fructiphilus*, has caused millions of dollars of losses just this year to major rose growers (Windham, 2018). The Combating Rose Rosette team formed with funding from an USDA Small Crops Research Initiative (SCRI) Grant is looking at all aspects of the disease. The Tennessee group is tasked to develop best management practices (BMP) and evaluate rose species for resistance and study the biology of the mite vector.

Rose rosette symptoms are variable but common symptoms are: abnormal reddening of canes, excessive thorns on canes, rosettes (witches broom), thickened canes and death (Fig 1). Symptoms may vary by species or cultivar and by season. The most reliable symptom is the rosette.

Early best management practices (BMPs) studies found that pruning out rosettes from an infected plant did not save that plant (Windham, 2016). Infected roses should be removed promptly to stop spread of the disease. Recent studies have shown that

symptomatic rose tissue has 40-to-80 times the number of mites as non-symptomatic tissue. This provides incentive to remove infected plants. We also found that breaking up mass plantings of roses with taller non-host plants slowed the spread of rose rosette.

Also in earlier studies we looked at miticides as a means to protect roses. While common products such as horticultural oil, carbaryl, and Avid were not successful, some products did protect roses on a very short spray interval of one week (Windham, 2017). Current studies are looking at these products at 2, 4 and 6 week intervals.

Resistance studies have looked at various rose species and species. Most rose cultivars, numbered crosses and rose species are susceptible to rose rosette. This fall we plan to release a list of roses that have survived 4 years in our test plots. Recent roses added to our resistance trials include 1600 diploid and polyploidy rose crosses from Dr. Dave Byrnes laboratory at Texas A&M University. We are also trialing the Brindabella series of roses from Suntory in Australia.

A recent graduate of our program studied the biology of *Phyllocoptes fructiphilus* and conducted an extensive survey of the Deep South (Solo, 2017). Stories of a “southern line” of rose rosette had circulated in the rose world. Our student found indeed that was true. If you draw a line from Vicksburg, MS to Tuscaloosa, AL, to Birmingham, AL to Macon, GA - she found little rose rosette below the line. She found that mite numbers were highest above this line, but also found that even though the disease could not be found, mites could be found south of this line. She also found one eriophyid mite species in several locations, south of the line that has only been reported on roses in Israel. In another study, this student found that mites have a tendency to stay on rose tissue even after it's removed from the plant. Early BMP's suggested bagging infected

plants during removal. This may not be needed as mites remained on tissue removed from roses up to 48 hours.

The Combating Rose Rosette team is comprised of rose breeders, horticulturalists, plant pathologists, entomologists and diagnosticians. Work continues on a quick test for rose rosette, biological studies of the mites associated with rose rosette, evaluation for resistance to the virus or mite, mechanisms of resistance to the virus and the complexity of the virus.

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Figure 1. Symptoms of rose rosette disease may include: a witch's broom (rosette)(top-right), thickened cane, excessive thorns (left), burgundy new growth (left, bottom right)..