

The background of the slide is a photograph of a large, dense rose bush with many bright pink flowers. The bush is situated next to a paved road where several cars are parked. To the right of the rose bush is a tall, thin, light-colored column. The overall scene is outdoors during the day.

Unravelling the Rose Rosette Puzzle

Mark Windham
University of Tennessee

Why have we been so concerned about rose rosette?



If left unchecked, rose rosette can destroy large gardens or commercial plantings in a few years.



The only recognized way to control RRV has been to destroy bushes when the disease severity is high

In Tennessee, mass plantings of Knock Out® roses have been devastated by rose rosette



Why concerned?: the type of 'advice' on the web



"I'd personally be a little nervous about replanting any rose in a bed that had rosette-infected roses - even a year later. Call me chicken, but I'd be looking at something like sweetspires or spireas or caryopteris" **George Weigel**, voted a top 5 garden writer by the Garden Writers Assoc.

Dirt Doctor's advice for treating for rose rosette

Next, choose one of the following spray formulas:

- 1. To 1 gallon of spray with Garrett Juice Plus add 8 ounces of 3 percent hydrogen peroxide (available at drug and grocery stores).*
- 2. To Garrett Juice Plus spray add 2 ounces of orange oil.*
- 3. To Garrett JuicePlus spray add 1 tablespoon of Bio Wash. Spray the plants thoroughly.*



What does rose rosette look like?



Phyllocoptes fructiphilus

- Wind-borne
- RRV may multiply in vector
- First described: Clarksburg, CA on buds of wild rose *Rosa californica*



Look for eriophyid
mites on surface
of leaf sheath

Photos courtesy of
Baldo Villegas



Eriophyid mites

Photo courtesy of
Baldo Villegas

Where Can Rose Rosette Hide?



Distribution of multiflora rose



Multiflora rose can be found in wooded areas, along roadsides, in pastures, disturbed sites (like power-line right-of-ways, even as an ornamental

Where else does rose rosette hide?



In retail
businesses



Commercial
plantings



Club sales, swaps
and giveaways

Are Knock Out[®] roses more susceptible to RRV?



- Knock Out[®] roses are NOT more susceptible to rose rosette!
- Due to commonality of Knock Out[®] roses in mass plantings, rose rosette is often seen on these roses
- Unpruned Knock Out[®] roses may grow tall and intercept 'ballooning' eriophyid mites . This phenomenon may explain why susceptible miniature roses are rarely reported with RRV

RRV found in a bed of Drift® roses at a garden center that sells hundreds of roses annually



We instruct landscapers/nursery owners that being observant is critical or things can go bad quickly!



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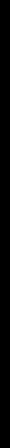
Being observant and detecting rose
rosette early is critical



Being observant and detecting rose rosette early is critical



Management plans may have different requirements for different 'cropping systems'



Development of a Rose Rosette Best Management Plan for Rosarians

A partnership between the American Rose Society
and TN AgResearch

UT's rose rosette team



Frank Hale,
Entomologist



Reza Hajimorad,
Virologist



Walt Hitch,
Station Director



Alan Windham,
Plant Pathologist



Mark Windham,
Plant Pathologist



Dr. Don Myers – Research Trust, American Rose Society, Chair

Dr. Bruce Monroe, American Rose Society, President

Rose Rosette Advisory Panel

Ann Peck, Chair – Asheville Rose/Blue Ridge Rose Soc.- private gardener

Judy Deutsch - Asheville/Blue Ridge Rose Soc. - private gardener

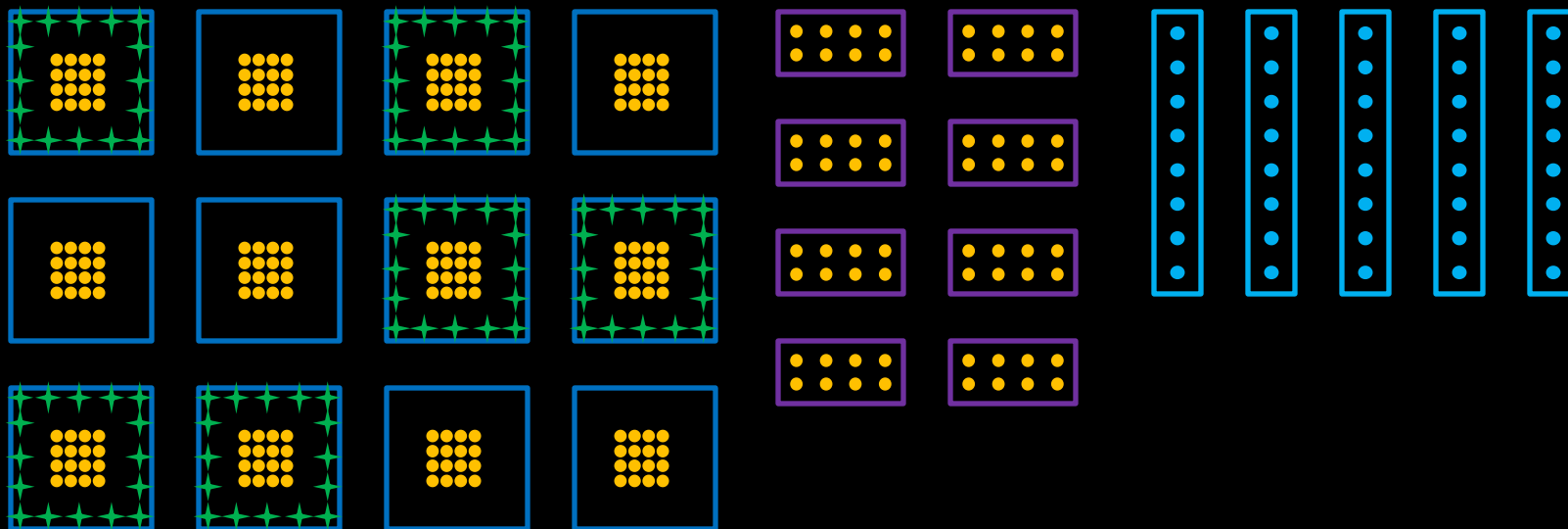
Jeff Garrett - Tri State Rose Soc. (Chattanooga) – private gardener







Sarah Johnson - Cookeville Rose Soc. - Johnson Garden Center

Larry Peck – Asheville/Blue Ridge Rose Soc. – private gardener

Mike Thompson – Holston & Tenn. Rose Soc. – professional rosarian

Rose Rosette Reservoir

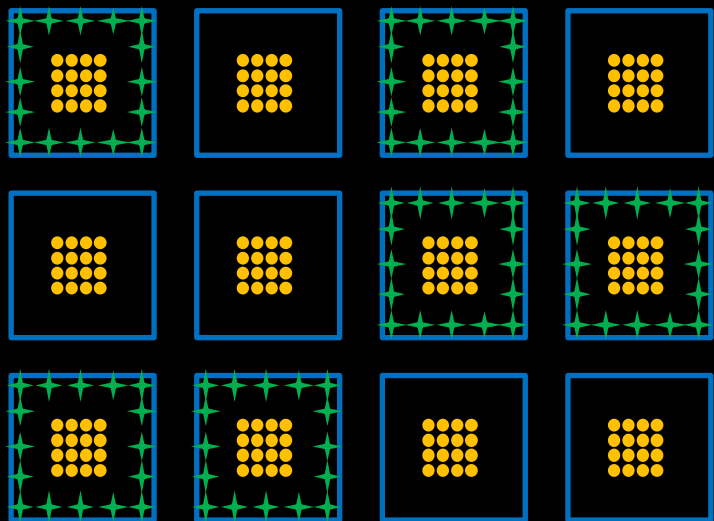


-  Experiment 1 Barriers
-  Experiment 2 Miticide Trial
-  Experiment 3 Pruning
-  Knock Out Rose® 1 gal
-  Knock Out Rose® Transplanted
-  Knockout Rose 3 gal

RRV reservoir



Experiment 1: barriers



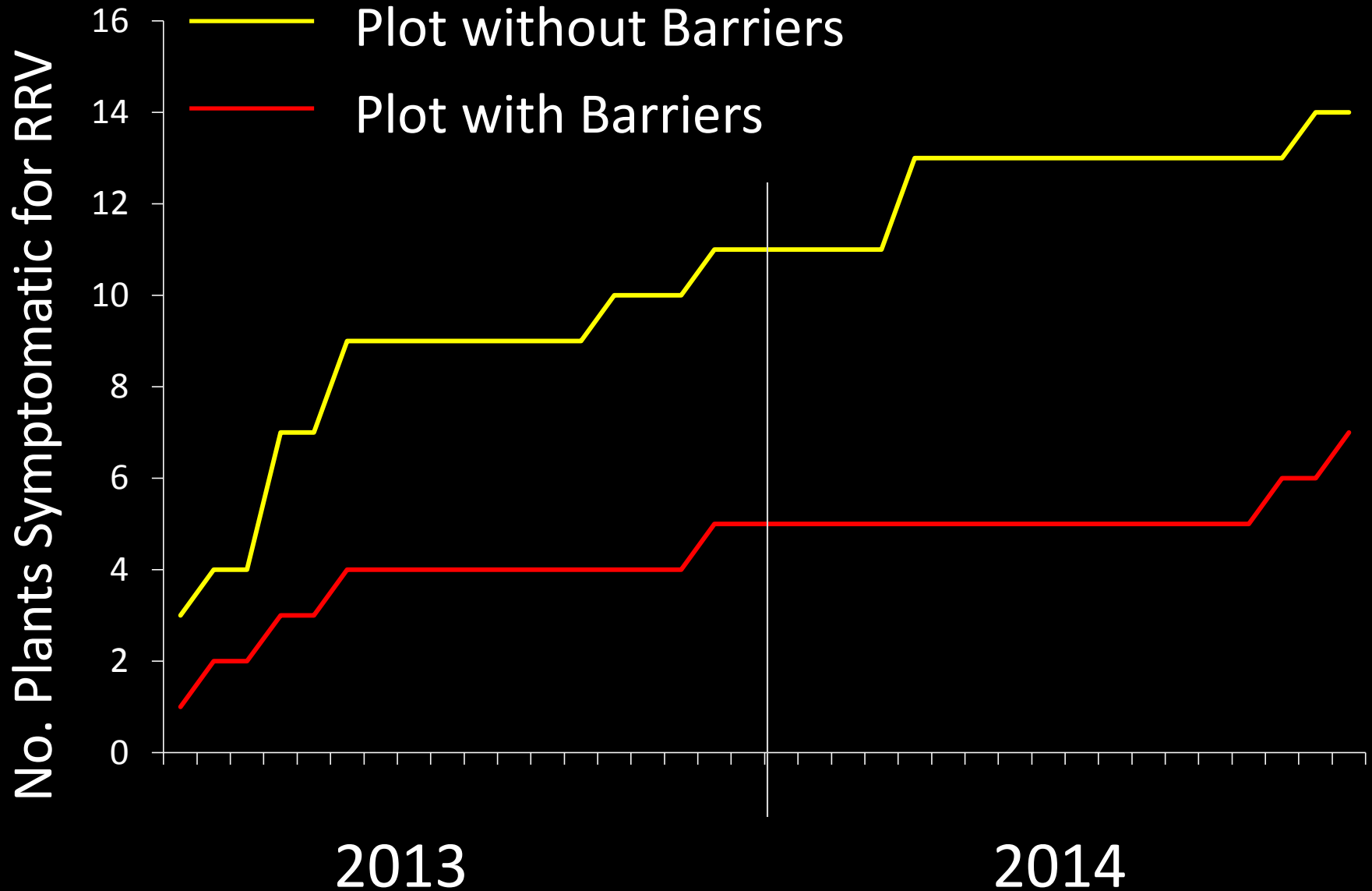
- Knock Out® Rose

- ★ *Miscanthus sinensis*

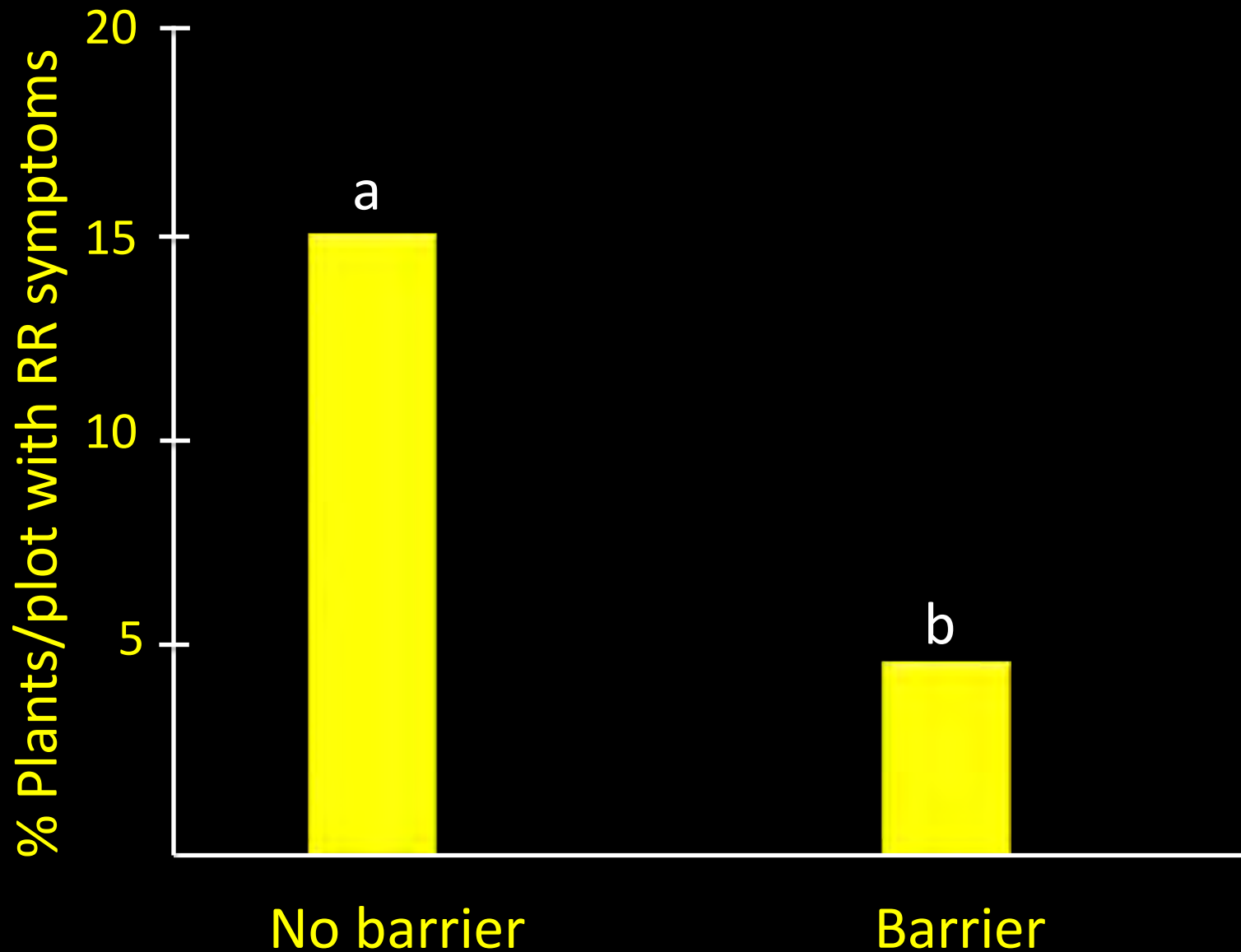
Each plot contains
16 roses



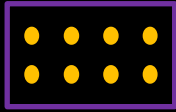
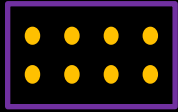
Incidence of RRV in barrier expt. - 2013



Barrier effects on incidence of rose rosette

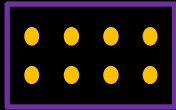
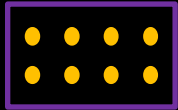


Experiment 2: miticides



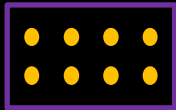
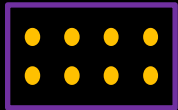
Akari

Kontos



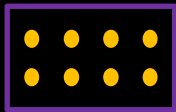
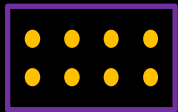
Avid +

Sevin



Horticultural oil

Talstar



Forbid

Water Spray,
Control

Horticultural oil



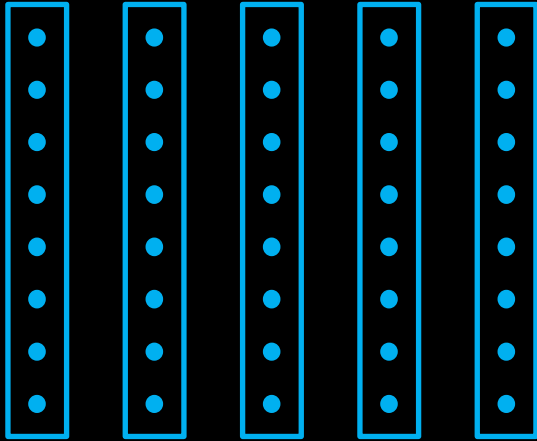
Miticide control expt. status

- ✓ Only the sevin treatment and control have rose rosette symptomatic plants



- ✓ Significance differences: other miticides and the sevin and control treatments
- ✓ Allington et al. (1968. J. Econ. Entomol. 61:1137-1140): spider mites are predators of *P. fructiphilus*. Will loss of spider mites in miticide treatments affect our results?

Experiment 3: pruning



Hypothesis: RRV can be eliminated by pruning out symptoms of RRV if pruning is done at the right time.



RRV symptomatic canes
pruned out at detection or 1
month after detection

Pruning expt. status

- ✓ 4 plants marked for pruning at 1st detection and 8 plants marked for pruning at 1 month
- ✓ All marked plants had symptomatic canes removed to base of plant and plants moved 6 miles to quarantined area for observation.
- ✓ 1 plant (first detection) with RRV and 5 (1 month) with RRV



Rose rosette and the Beall Family Rose Garden – rogueing as a strategy





- Roses are inspected for RRV symptoms daily
- Symptomatic roses dug, bagged and discarded
- No adjacent plant to a rogued plant has become symptomatic
- Garden opened in 2009, 2-4% roses rogued each year
- 4-5% of roses replaced each year to keep garden fresh
- Public (and garden director) oblivious to problem

Can we learn to live with rose rosette?

We do successfully every day in the
Beall Family Rose Garden



Management summary for rosarians

- ✓ Constant vigilance for rose rosette symptoms is critical
- ✓ Rogueing is an effective strategy for maintaining gardens with minimal losses
- ✓ A green barrier on windward side of garden and miticides may be useful
- ✓ Insufficient data have been collected to determine if pruning will be useful strategies or if they will be wastes of time and money

NIFA Proposal 2014-07901: Combatting Rose Rosette Disease: Short Term and Long Term Approaches

- Dave Byrne (Texas A&M) is Principle Investigator
- 18 CoPIs at universities and federal labs across the country and scientists from rose companies
- Fully funded proposal! \$4.6 million over 5 years

1. Easy detection methods

- a. must be easy to use, quick and inexpensive
- b. symptoms on different types of roses

2. Best Management Practices

- a. directed toward producers
- b. miticide treatments – expanded
- c. antiviral compounds
- d. predatory mites

3. Epidemiology

- a. effect of temperature on mite survival
- b. virus movement in plants
- c. understand how and the rate of spread in rose beds

4. Resistance studies

- a. 350-400 *Rosa* species / rose cultivars tested for resistance to virus and mite
- b. Optimize digital genotyping for creating a diploid and tetraploid rose map using 1000 SNPS
- c. Discovery of markers associated with resistance

5. Economics of rose rosette

- a. Cost of RRD at all levels
- b. Benefit of BMP and resistant roses at all levels

6. Outreach

- a. Monitoring network
- b. Best Management Practices for all levels
- c. Training modules for county agents, master gardeners and consulting rosarians

Questions? Comments?

