

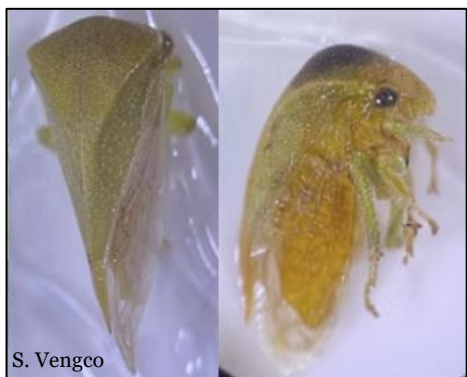
Monitoring Treehopper Girdle Activity in Vineyards: What we have learned (2023-2025)

Spissistilus festinus and *Tortistilus wickhami* are two treehoppers found in California vineyards. They use their mouthparts to pierce phloem tissue, disrupting nutrient flow and creating a girdle. They feed on nutrients that accumulate above the girdle.

Treehoppers

S. festinus

(*Threecornered Alfalfa Hopper*)



T. wickhami

(*Tortistilus*)



S. festinus is a vector of grapevine red blotch virus.

Treehopper Girdles

In red wine varieties, girdles result in the reddening of leaf tissue (typically 1-3 leaves), as the plant responds to the feeding damage.



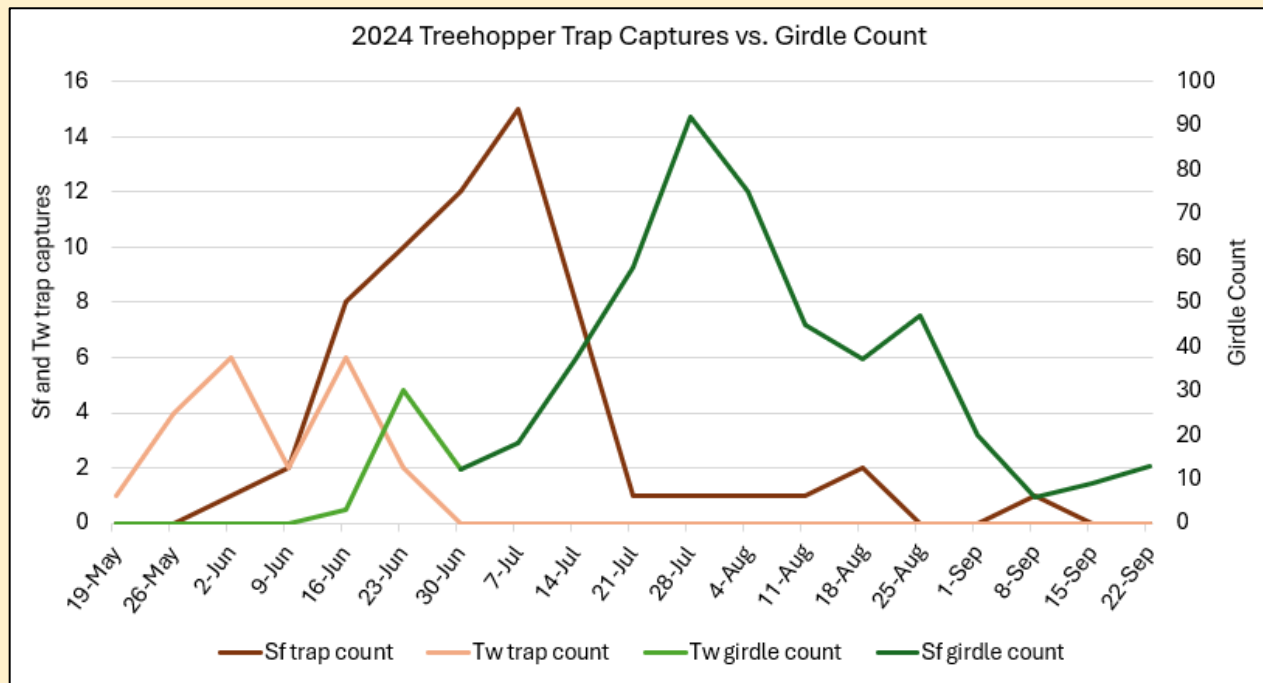
A girdle may be visible on the petiole or lateral, proximal to the red leaves

Visit the UCCE Napa Viticulture Team website to learn to identify *S. festinus* and *T. wickhami* and for more information on girdles and girdle monitoring.



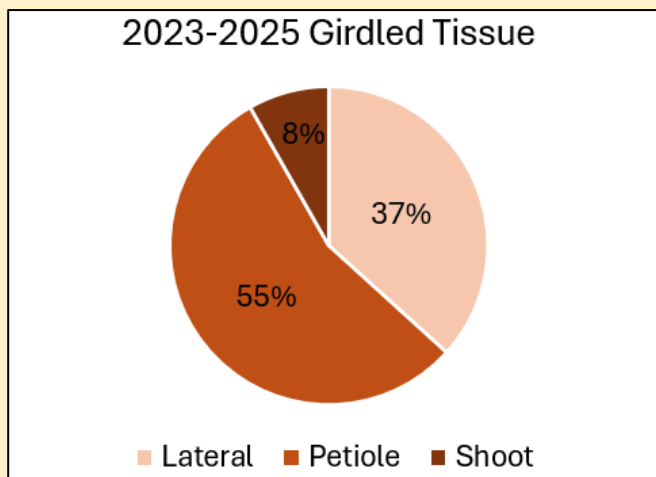
Variations in treehopper girdle activity

The biology of *S. festinus* and *T. wickhami* is different, and this influences the time of year that they are detected in vineyards. In general, traps detect *T. wickhami* before *S. festinus*. Therefore, early-season girdles are more likely to be *T. wickhami*, after which they are more likely to be *S. festinus*. Given the insects are rarely observed on girdles, traps can be used to establish which species are present at a site and when.



Variations in girdled tissue

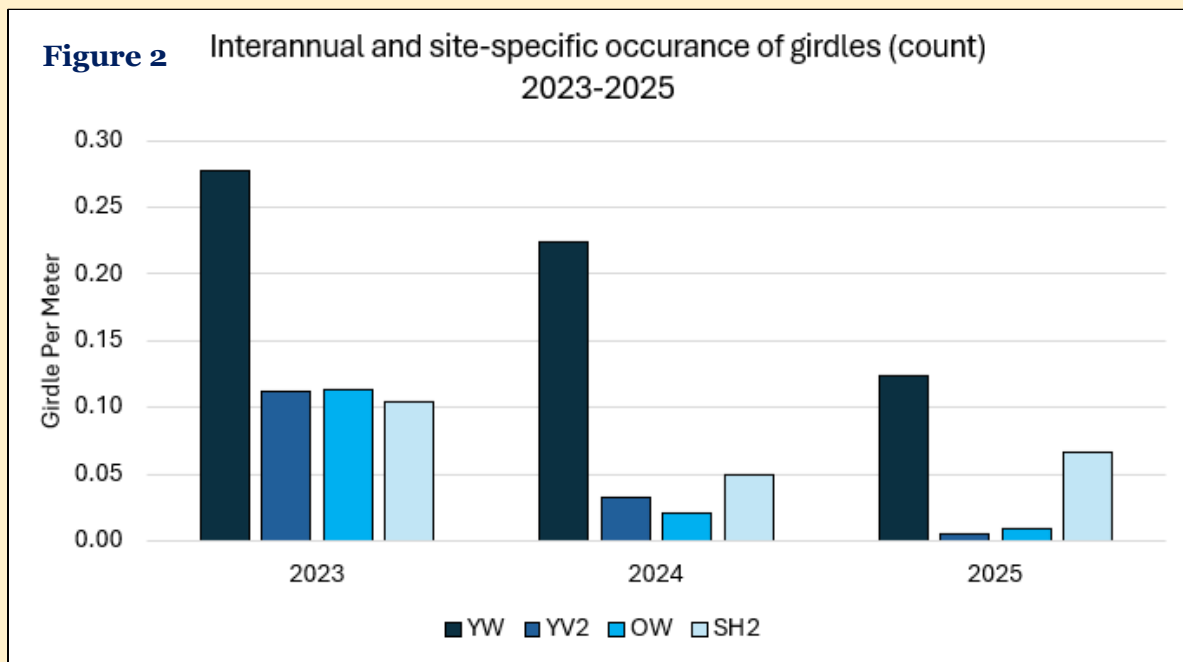
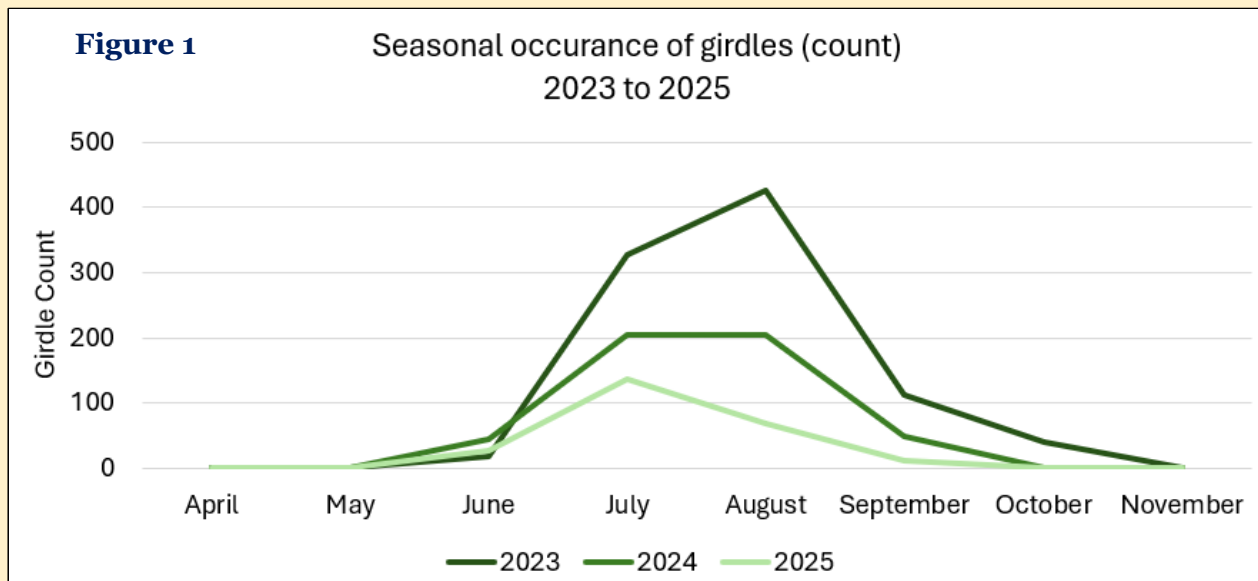
Girdles can occur on petioles, laterals or shoots; however petioles and laterals are the preferred tissue.



Girdled Petiole
Girdled Lateral

Seasonal, interannual and site-specific occurrence of girdle activity

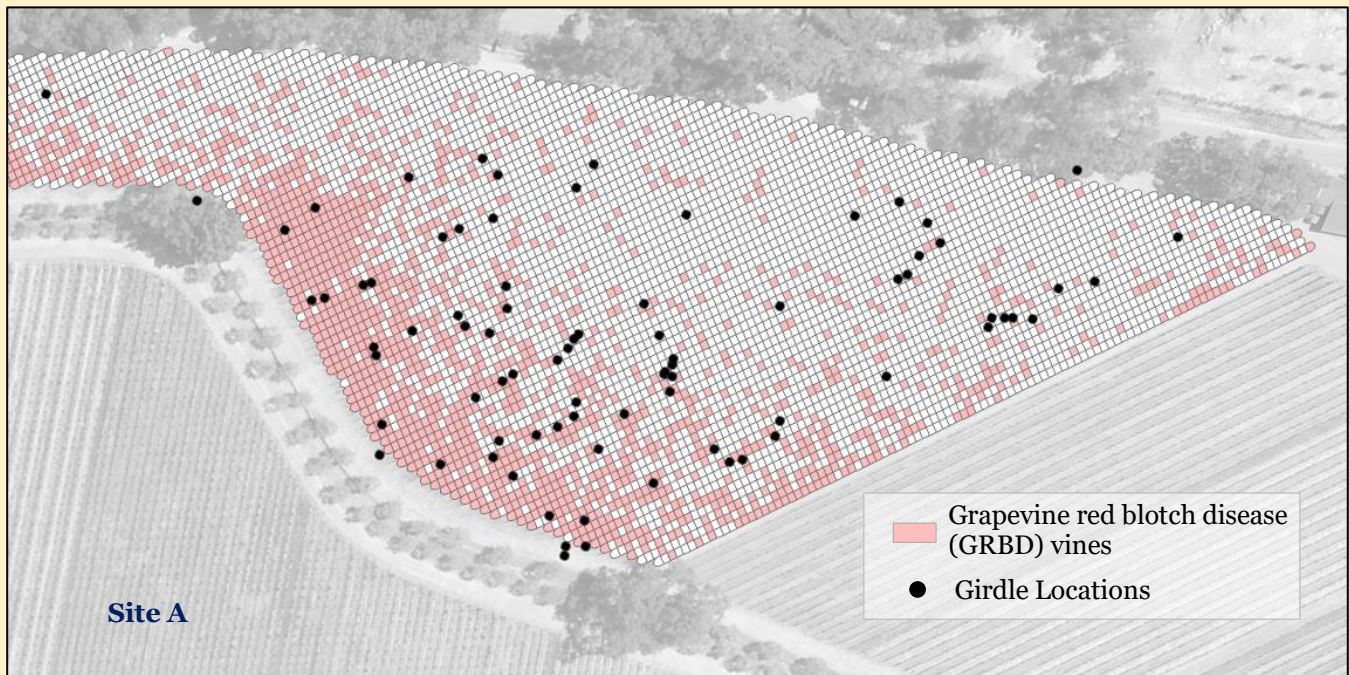
Seasonal and interannual variability in girdle activity may be explained by the quality and quantity of feeding and breeding hosts within the broader landscape. It has been shown that *S. festinus* initiate feeding in vineyards when other (often preferred) plants in the landscape dry down and become unsuitable hosts (Wilson et al. 2020). Thus, *S. festinus* are opportunistically feeding on grapevines, an irrigated crop in an otherwise dry landscape.



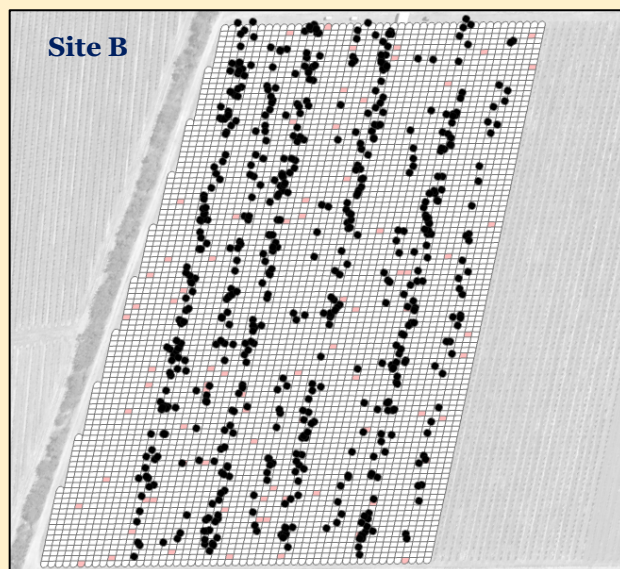
Environmental conditions (timing and amount of rainfall) that affect the quality and quantity of other preferred plant hosts within the landscape affect both **when** *S. festinus* move into vineyards to feed (**Figure 1**) and the **extent** of that feeding activity in vineyards (**Figure 2**).

Seasonal, interannual and site-specific occurrence of girdle activity

We are currently conducting trials to understand the observed site-specific variability in girdle activity. One potential explanation for this variability may be the distribution and density of feeding or breeding hosts within the landscape, as well as proximity of the vineyard block to these hosts and landscapes.



Girdle activity at **site A** is more prevalent at the edges of the vineyard blocks, adjacent to landscape features that could contain suitable host plants. Additionally, the pattern of GRBD symptomatic vines follows the general pattern of girdle activity with both being more concentrated towards the vineyard edge.



Girdle activity at **site B** was observed to occur throughout the block, suggesting a distribution of host plants (other than grapevines) within the vineyard itself is contributing to *S. festinus* populations, rather than the adjacent landscape. Both girdle and GRBD incidence are evenly distributed throughout the block.