

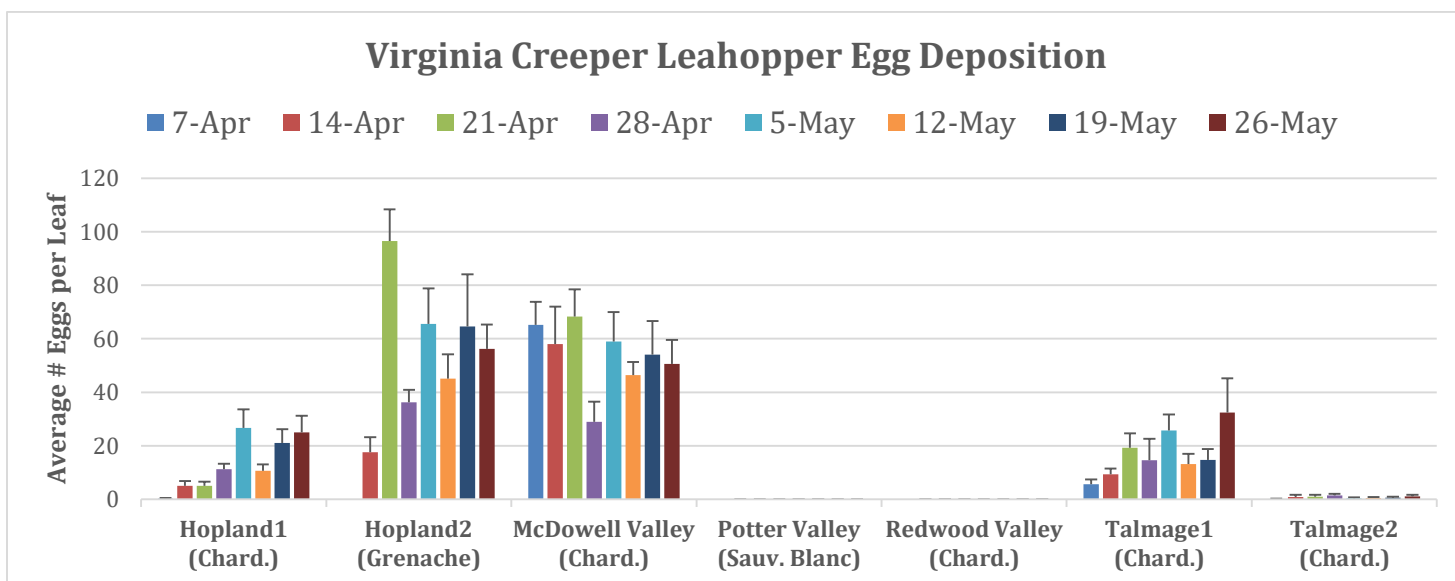
## Regional Monitoring Effort

This season we are monitoring the development of Virginia creeper leafhopper (*Erythroneura ziczac*) and Western grape leafhopper (*Erythroneura elegantula*) populations in Mendocino County vineyards. We are monitoring 7 sites this year, located in McDowell Valley, Hopland, Ukiah/Talmage, Redwood Valley and Potter Valley. Virginia creeper leafhopper (VCLH) is currently not found in Redwood Valley or Potter Valley. The Hopland/McDowell sites are monitored by Lucia Varela and all other sites by Ryan Keiffer. Additional information about the Virginia creeper leafhopper research program in Mendocino and Lake County can be found on our project website (<http://ucanr.edu/sites/vclh>).

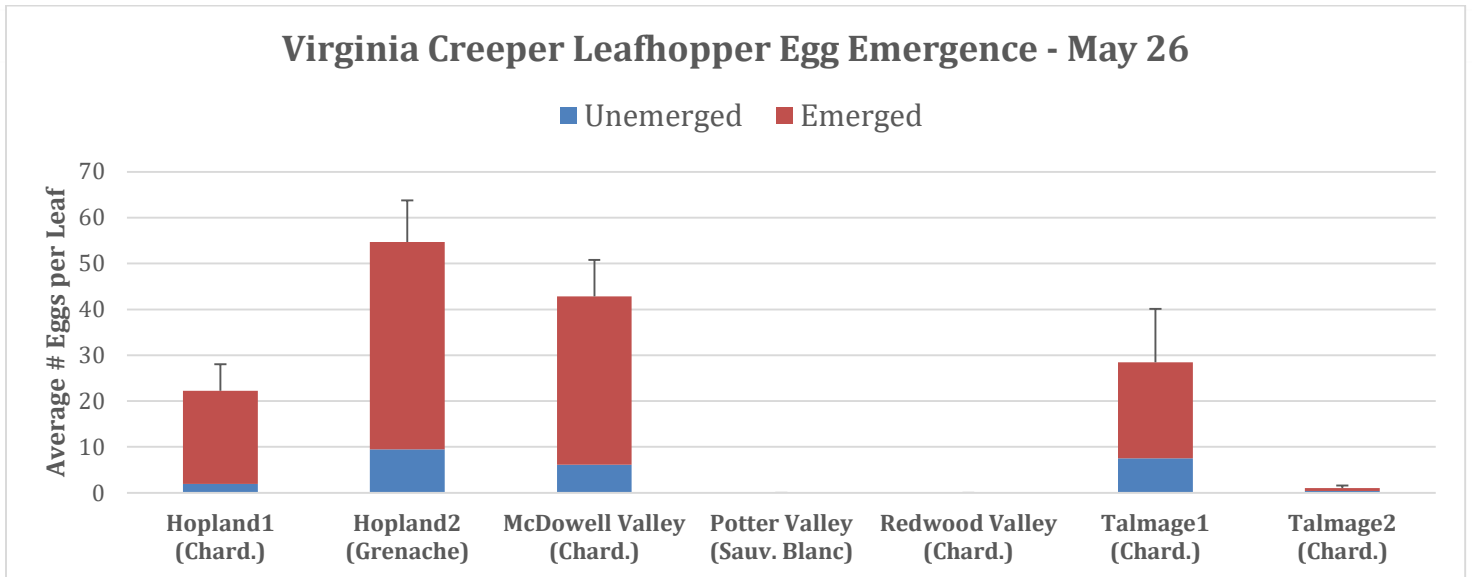
## Egg Deposition on the Grape Vine

Adults of both leafhopper species began to move into the vine canopy and lay eggs during the first week of April. Peak oviposition occurred during the first week of May.

Virginia Creeper Leafhopper (VCLH): At the five sites where VCLH is present, it is the dominant species. We have been seeing the highest populations of VCLH in the McDowell Valley and Hopland areas (Fig. 1). The remaining VCLH eggs are close to completing development and most already show signs of nymph emergence (Fig. 2).

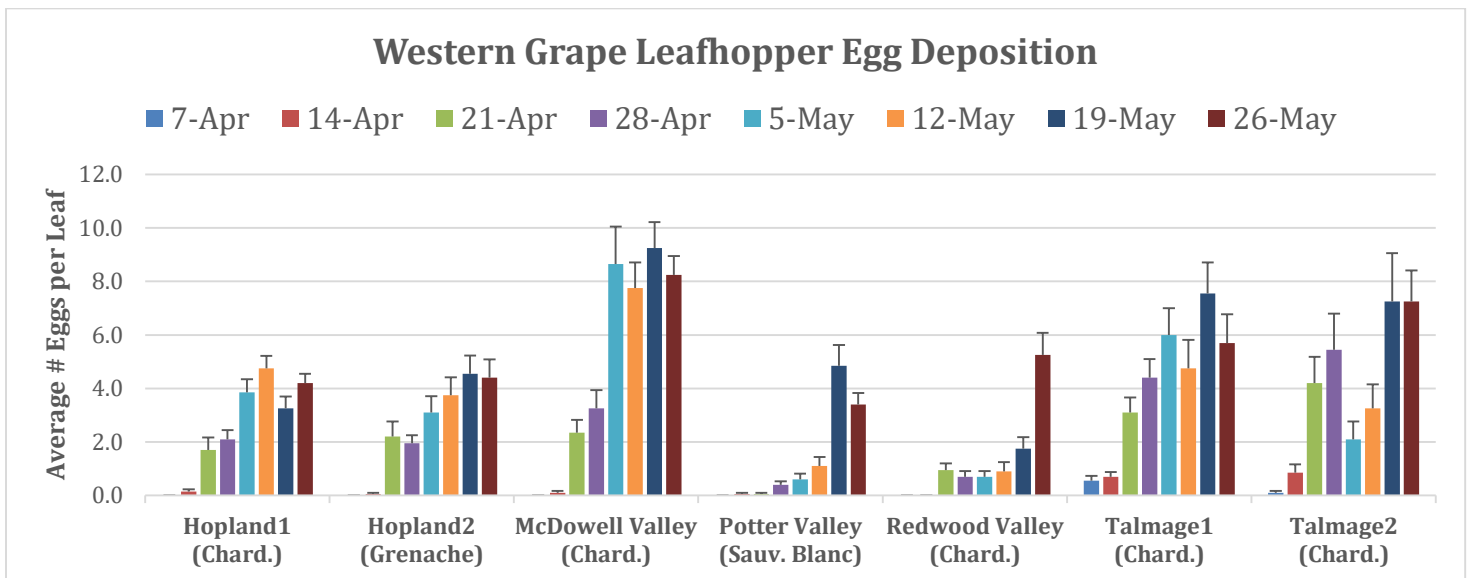


**Fig. 1. Total VCLH egg deposition is highest in the McDowell Valley and Hopland areas. Note the difference in scale (y-axis) between VCLH and WGLH egg deposition graphs.**

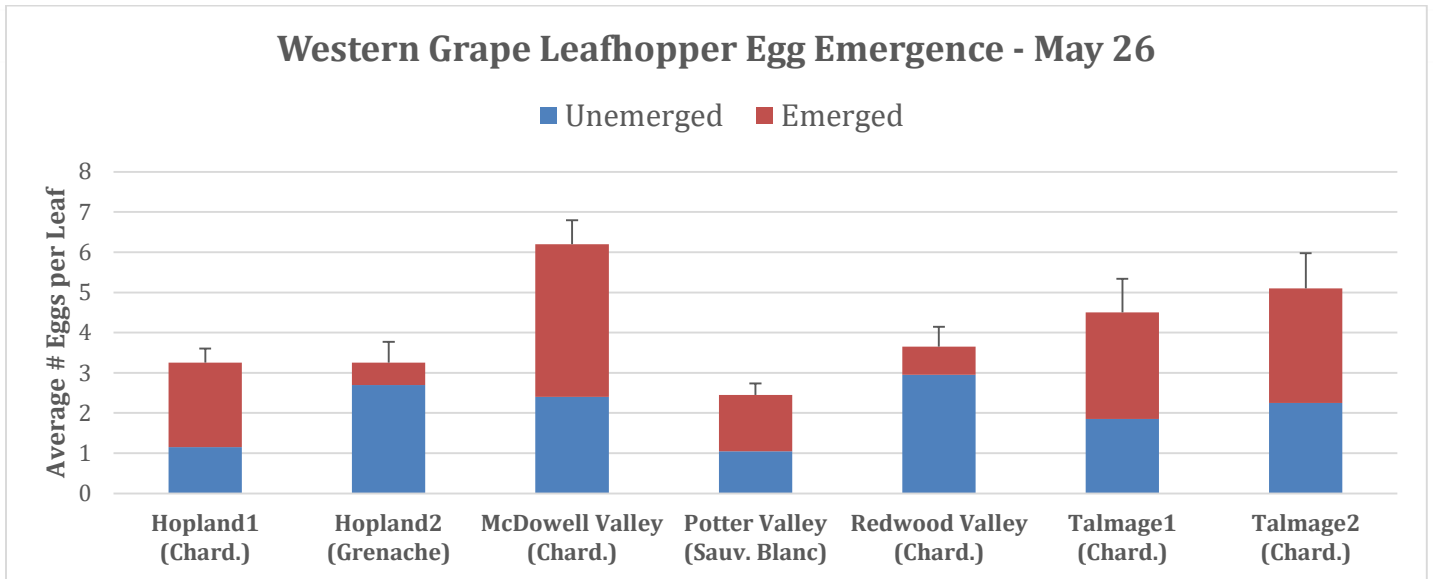


**Fig. 2. Approximately 79% of VCLH eggs show signs of emergence, although it varies by region.**

**Western Grape Leafhopper (WGLH):** WGLH egg deposition has started to level off, with the exception of Redwood Valley, where we saw another increase from the previous week (Fig. 3). While initially overall egg deposition in Potter Valley and Redwood Valley was relatively low, it is now equivalent with the other sites. The highest WGLH populations are in the Talmage and McDowell Valley areas. Most of the WGLH eggs are close to completing development and almost half show signs of nymph emergence (Fig. 4).



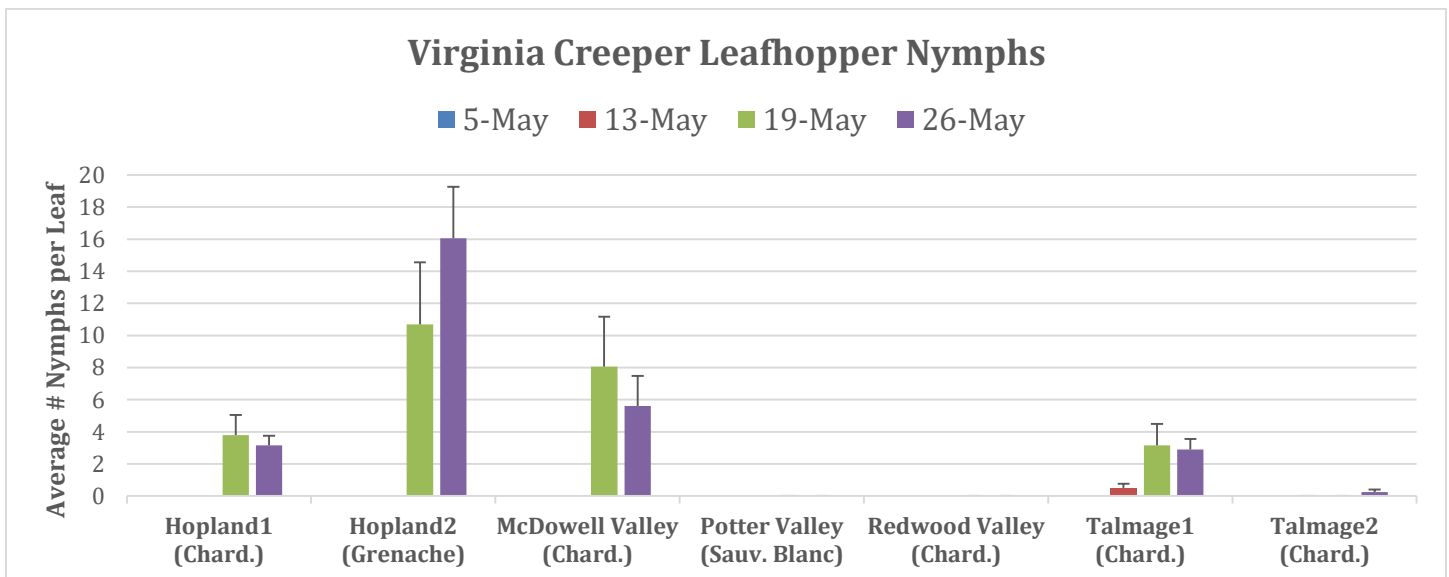
**Fig. 3. Total WGLH egg deposition is highest in the McDowell Valley and Talmage areas. Note the difference in scale (y-axis) between VCLH and WGLH egg deposition graphs.**



**Fig. 4. Approximately 48% of WGLH eggs show signs of emergence, although it varies by region.**

### Nymphs on the Grape Leaves

On May 5<sup>th</sup> we observed the first leafhopper nymphs in the Hopland and McDowell Valley areas, followed by the Talmage area on May 12<sup>th</sup>. We are now seeing leafhopper nymphs at all sites monitored in Mendocino County. See below for more information on leafhopper nymph species identification. A majority of the VCLH and WGLH nymphs were 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> instar (stage) (Figs. 5-7). Many 1<sup>st</sup> instars can still be found, but cannot be distinguished between VCLH and WGLH. We have not yet observed any 5<sup>th</sup> instars (final stage before molting into adults).



**Fig. 5. Most VCLH and WGLH nymphs were 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> instar (stage). We have not yet observed any 5<sup>th</sup> instars (final stage before molting into adults).**

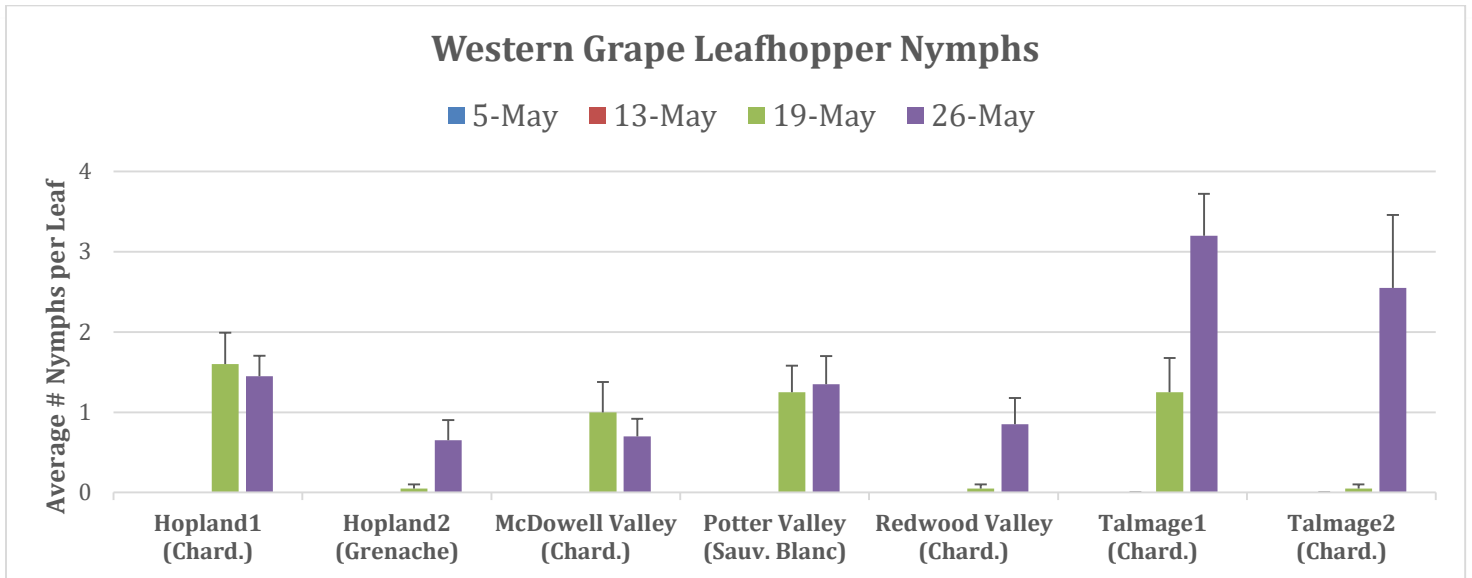


Fig. 6. Most VCLH and WGLH nymphs were 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> instar (stage). We have not yet observed any 5<sup>th</sup> instars (final stage before molting into adults).

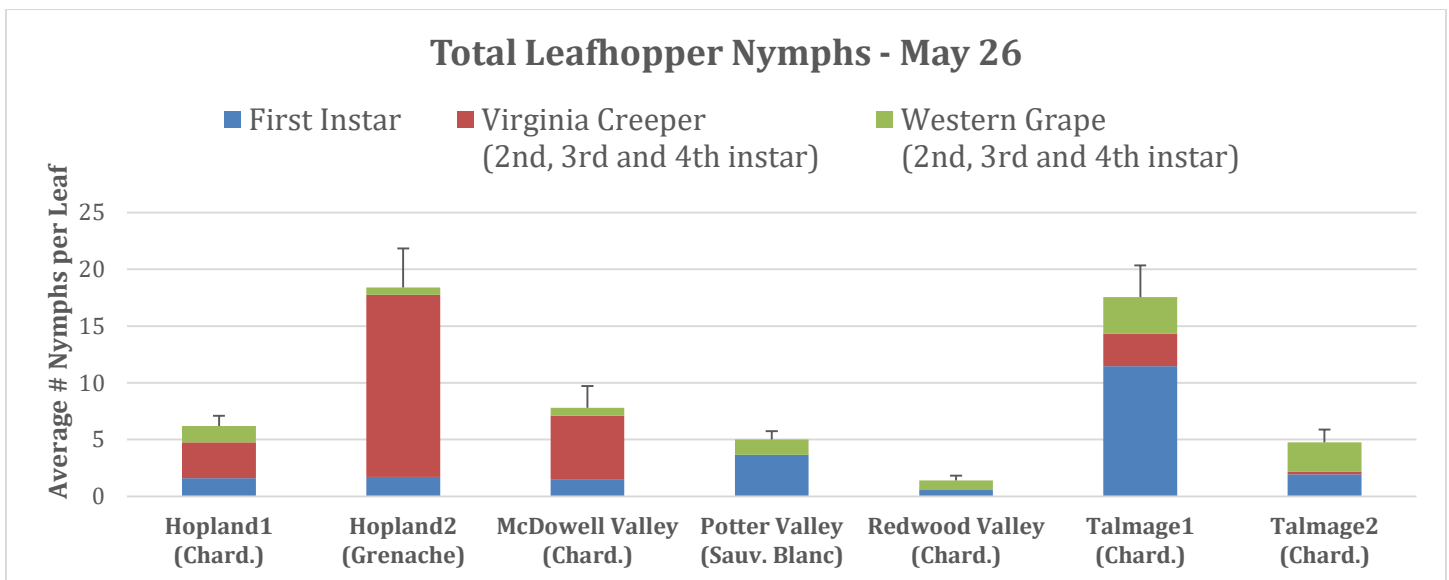


Fig. 7. Most VCLH and WGLH nymphs were 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> instar (stage). We have not yet observed any 5<sup>th</sup> instars (final stage before molting into adults).

### Peak Nymph Emergence

Many of the VCLH and WGLH eggs have completed development, or are close to completing development. Approximately 79% of VCLH eggs and 48% of WGLH eggs now showing signs of nymph emergence, although this varies by region (Fig. 2 and Fig. 4). We project that this week (May 29 – June 4) we will continue to see more 4<sup>th</sup> and 5<sup>th</sup> instars. The

following week (June 5-11) we expect to see more 5<sup>th</sup> instars and possibly the beginning of adult emergence. We would then expect to see more adults in the week of June 12-18.

This is the week to monitor your vineyard to determine if control measures are warranted. Based on monitoring, if control measures are needed, the optimum application period would be when the majority of the population is still in the younger nymphal stages and before adults begin to emerge. This is especially important if you plan to spray with an oil. Depending on population levels at your site, a follow-up application may be required to impact nymphs that emerge after the spray. Consult your PCA for materials, rates and timing.

## Leafhopper Nymph Species Identification

Virginia creeper and Western grape leafhoppers are approximately the same shape, size (0.03 - 0.10 inch / 0.8 - 2.5 mm) and color (white/yellow) with the key exception that VCLH nymphs develop 4 distinct brown/red spots on their thorax as the nymphs mature. The spots don't appear until the nymph has molted at least once, so the early stage (1<sup>st</sup> instar) of both species is identical. The spots on VCLH nymphs are light orange on 2<sup>nd</sup>/3<sup>rd</sup> instars and become brown/red on the 4<sup>th</sup>/5<sup>th</sup> instar. At this time of the year, leafhopper nymphs can be found on fully-expanded, mature basal leaves (nodes 1-5).



**Western Grape Leafhopper**



**Virginia Creeper Leafhopper**

*Photos: Jack Kelly Clark, UC IPM (left); Mike Poe, Comm. Services, ANR (right)*

## Parasitism Rates

We have been observing fairly consistent parasitism of WGLH eggs at all sites since May 5, indicating that the regional population of *Anagrus* spp. has colonized the vineyards. Some parasitism of VCLH eggs has been recorded in the Talmage, Hopland, and McDowell Valley areas, although at much lower levels than WGLH.

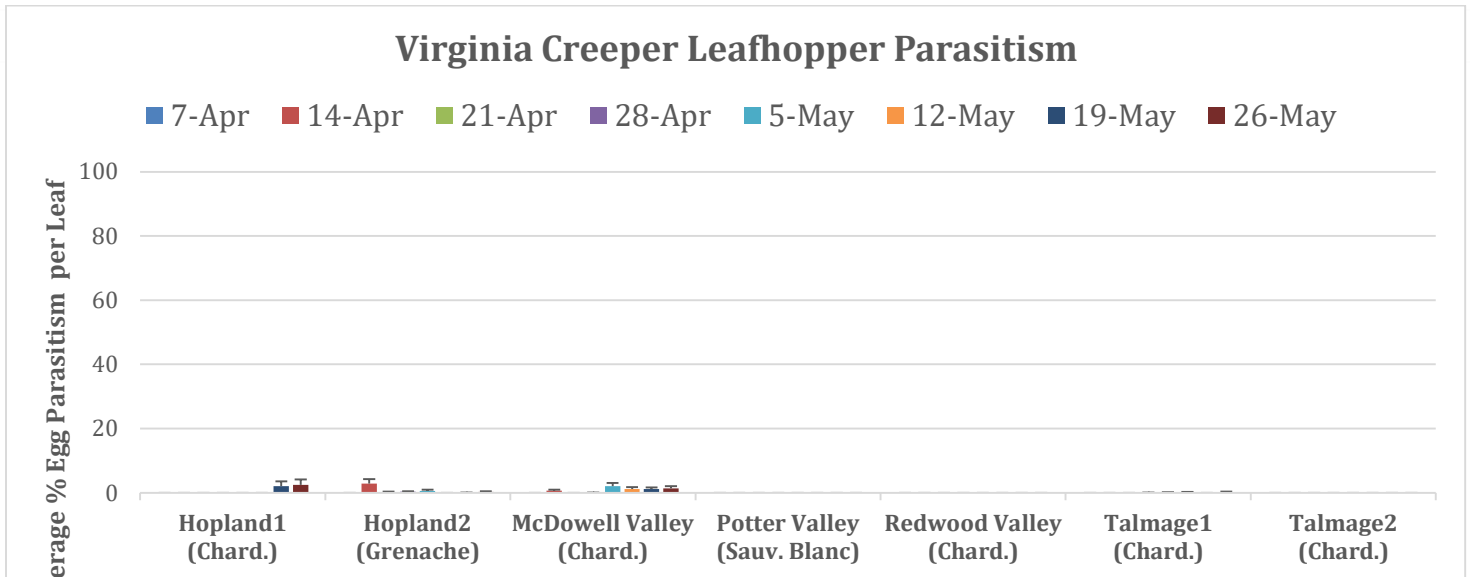


Fig. 8. Little to no parasitism of VCLH eggs has been observed at any of the sites.

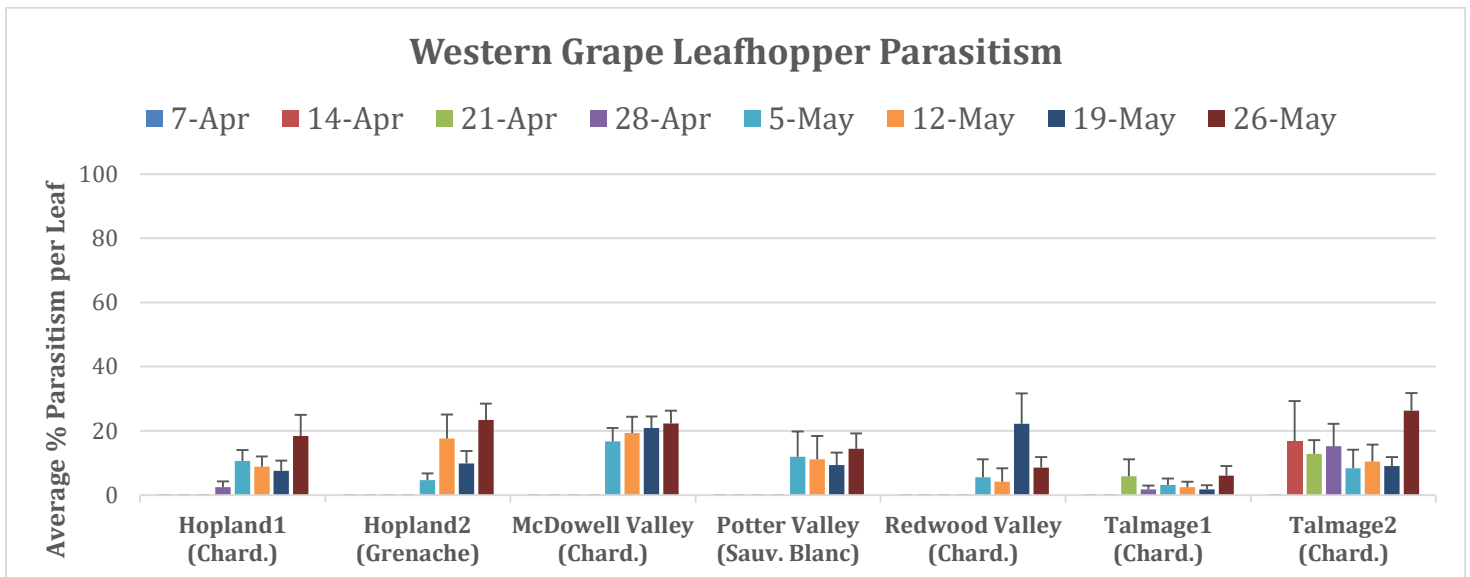


Fig. 9. Parasitism of WGLH eggs has been observed at all sites since May 5, indicating that the regional population of *Anagrus* spp. parasitoids have colonized the vineyards.

### Parasitoid Releases

Our previous research has shown that a population of the egg parasitoid *Anagrus daanei* from the Sacramento Valley will readily attack VCLH eggs. Last year we recorded a significant increase in VCLH parasitism following the release of these *A. daanei* into a vineyard in Hopland. This year we are making *A. daanei* releases throughout Mendocino and Lake County. On May 26 we released another batch of *Anagrus daanei* into a Mendocino County vineyard in the Hopland area. Releases are scheduled to take place approximately every week over the growing season. The next release is scheduled for June 3 in Mendocino

County. We will provide updates about additional releases and parasitism rates at the release sites as this work progresses.

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