

Three-Cornered Alfalfa Hopper: A Known Vector of Red Blotch

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VINEYARD TEAM
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As soon as the Red Blotch virus was identified in 2012, the discussion of possible insect vectors began. On February 26, 2016 Brian Bahder, a UC Davis Entomology post-doc, and Frank Zalom, a UC Davis Entomology Professor, announced that the Three-Cornered Alfalfa Hopper (TCAH) is confirmed to be [a vector of the Red Blotch associated Virus \(RBaV\)](#) on grapes. Bahder collected insects from vegetation surrounding vineyards with vines that had tested positive for Red Blotch. The patterns of Red Blotch infection in these vineyards suggested the virus was spread from vine to vine. From the insects he collected, he chose the species which are the most likely to vector the virus, such as sap sucking insects with piercing mouthparts.



Photo by Jack Kelly Clark.

These insects were raised in a virus-free environment and then placed on RBaV infected plants to feed. Then they were moved to healthy plants and allowed to feed. The uninfected vines tested positive for RBaV after the TCAH had fed on them for four months. This suggests that the TCAH may not be a terribly efficient vector of RBaV. But if there are eight months or so between dormant periods, there certainly is enough time for vectoring to take place.

The Three-Cornered Alfalfa Hopper (*Spissistilus festinus* Say) is a homopteran insect of the family Membracidae. It feeds on the phloem of the plant, which is why it can move virus from vine to vine. It is 6-7 mm in size and can be easily identified by its [distinctive shape and bright green color](#). Adults are taller than they are wide due to a prominent prothorax which extends back from behind the head over the rest of the body like a shield or cape. Its range is reported to be from [Canada into Central America and the West Indies](#).

The TCAH has been reported in [thirty-eight of the fifty states](#) representing the gamut of climate and habitats found in the continental United States. The most detailed information about TCAH biology and behavior is from pest management research on alfalfa. It has a wide range of host crops, but is most widely known as an [economic pest on alfalfa and soybean](#). The TCAH is a minor pest in vineyards on the North Coast of California. Feeding by late instar nymphs can cause girdling of leaf petioles and

lateral stems. This [damage](#) is described as looking similar to Grapevine Leafroll Viruses. The TCAH is found year-round in California and has 3-4 generations per season in Southern California. Three-Cornered Alfalfa Hoppers usually overwinter as adults with populations growing in late summer and declining in the fall.

There have been no known finds of the TCAH in San Luis Obispo or Santa Barbara Counties. The TCAH is more likely to be found in warmer areas with significant alfalfa production. So at this time the Three-Cornered Alfalfa Hopper does not appear to be a threat to vineyards on the Central Coast. If you want to look for the TCAH yourself, you can swipe a sweep net through ground covers. Its distinctive shape should make it easy to identify.

The most disturbing aspect of this discovery is that a widely found homopteran insect can vector Red Blotch. This means there could be many others. This is a point that Bahder and Zalom have emphasized. There are many insects in the environment we haven't paid much attention to which may be capable of vectoring RBaV.

For more detailed and high quality information, see UCCE Farm Advisor Mark Battany's recent post on his [Grape Notes](#) blog. The UC Statewide IPM website has two articles on the TCAH- one on the [alfalfa page](#) and one on the [grapes page](#).