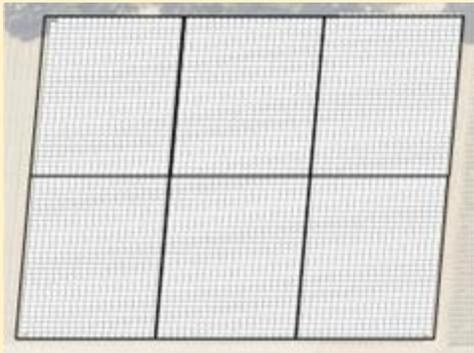


Adaptive Cluster Sampling

Adaptive cluster sampling is a method of sampling for **Grapevine Red Blotch Virus (GRBV)** that can reveal spatial patterns of infected vines and inform management decisions. It is particularly useful in blocks where visual symptom assessment is not possible such as **white cultivars** or blocks with **mixed infections of GRBV and other viruses**.

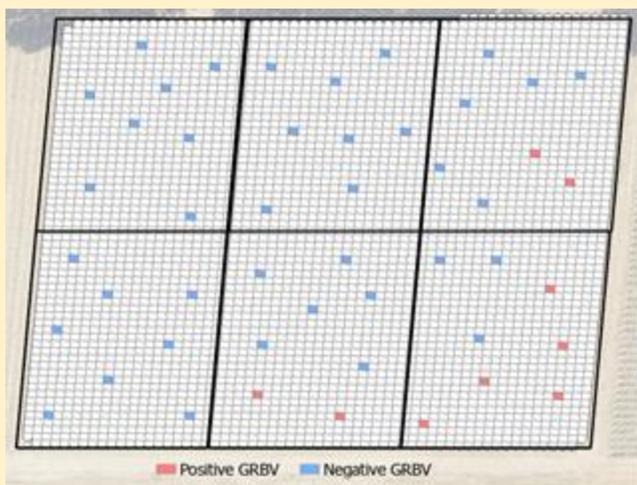
Step 1

Divide the sample block into 6 to 8 sections. Typical section size is 0.2 to 0.5 acres.



Step 2

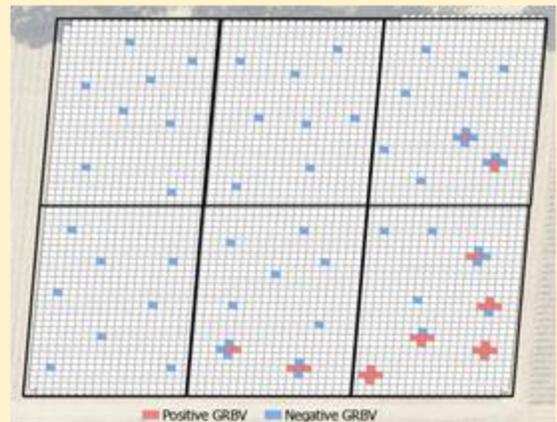
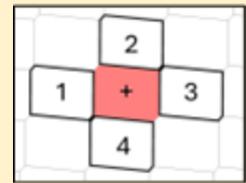
Randomly select 8 vines to sample within each section. Conduct diagnostic testing (LAMP-GRBV or PCR) for the selected vines.



Step 3

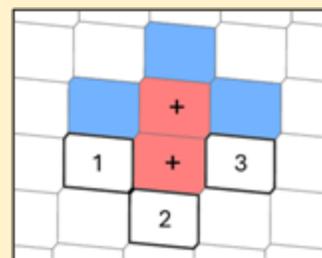
After the first round of samples are tested, select the nearest neighbors of all positive vines for a second round of testing.

Nearest neighbors are defined as the four adjacent within and across-row vines.



Step 4

Conduct additional rounds of “near neighbor” sampling, as necessary, to reveal more detailed patterns of GRBV infection.



Adaptive cluster sampling as a tool for zonal roguing

Blocks with a distinct hotspot and incidence below 16%, are good candidates for **zonal roguing**, where the entirety of a hotspot and buffer area is removed, including asymptomatic vines.

Adaptive cluster sampling can be used to further refine vine removal efforts.

Step 1

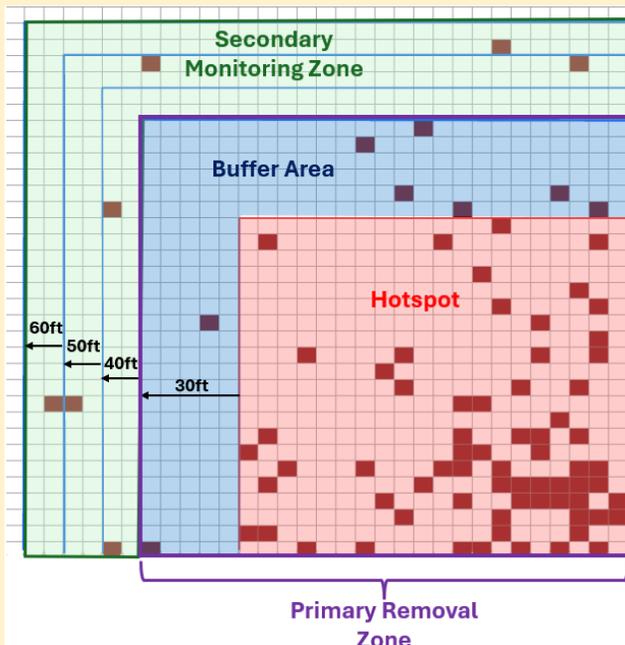
Define Zonal Roguing Action Areas

Hotspot: area containing an aggregation of diseased vines.

Buffer area: all vines within 30 ft of the hotspot boundary.

Primary Removal Zone: hotspot and buffer area where all vines, with and without symptoms, will be removed.

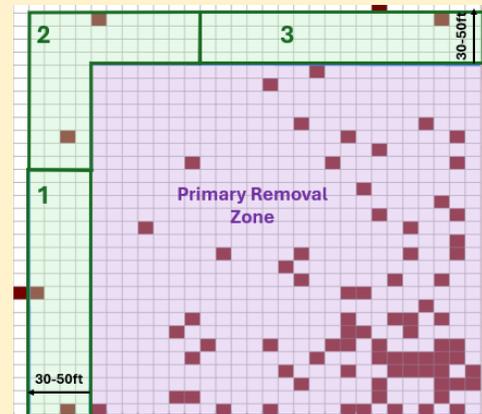
Secondary Monitoring Zone: all vines within 30 to 60 ft of the hotspot boundary, where adaptive cluster sampling will be used to assess GRBV incidence.



The secondary monitoring zone can be further divided into **30-40 ft**, **40-50 ft**, and **50-60 ft** sections.

Step 2

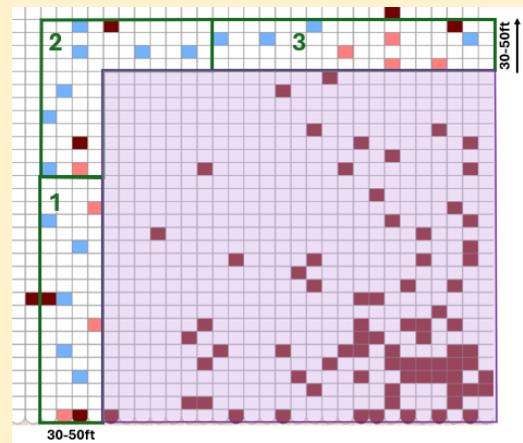
Divide the **30-50 ft zone** into even sections.



Section size, shape and quantity will vary depending on the size and orientation of the hotspot.

Step 3

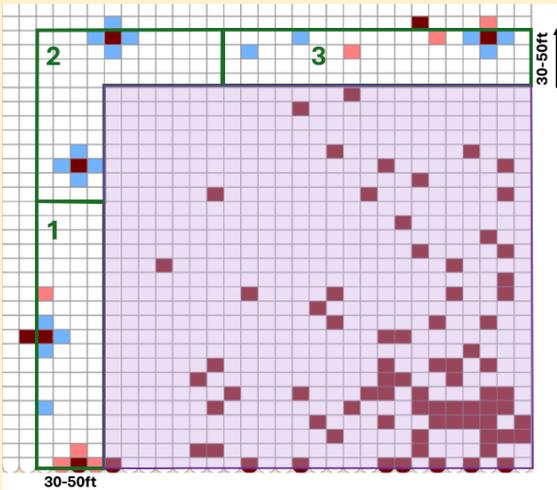
Randomly select **8 sample vines** within each section and conduct diagnostic testing.



Adaptive cluster sampling as a tool for zonal roguing

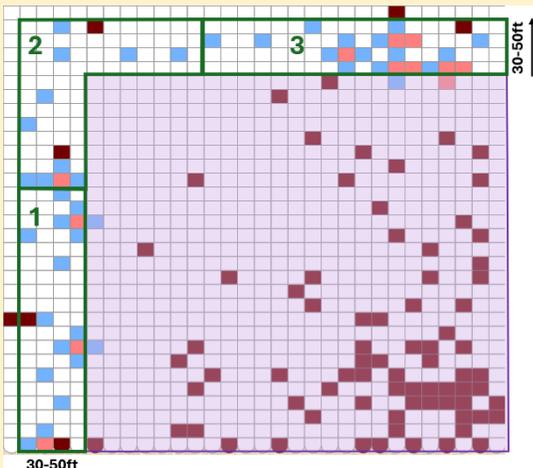
Step 3: Optional

Within the secondary monitoring zone, select and test the nearest neighbors of **symptomatic vines**. This can be done as a substitution or in addition to the 8 random sample vines.



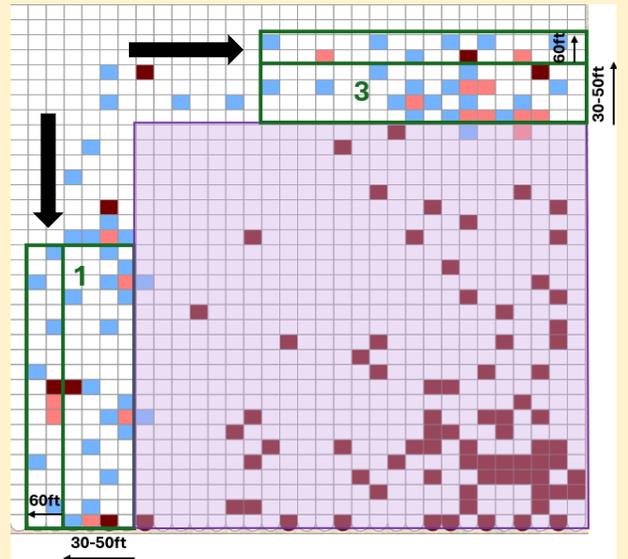
Step 4

Follow the **nearest neighbor** sampling protocol described previously (page 1, step 3).



Step 5

If **clusters of infected vines** are detected, further testing in the 50-60 ft zone can be conducted.



In this example, additional sampling was conducted in sections 1 and 3, based on pattern and incidence of GRBV infections.

Next Steps

The pattern and incidence of GRBV infections in the monitoring area may necessitate additional surveillance and vine removal activities.

More information on Grapevine Red Blotch Virus and LAMP-GRBV can be found on our website.

