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"Mystery Disease": Evidence for a Stress-Related Viroid Complex.

Observations of field symptoms suggest that the "Mystery Disease" recently expressed in the Napa Valley is similar to yellow speckle disease common to Australia. Two viroids, grapevine yellow speckle-1 and-2 (GYSVd-1 & GYSVd-2), have been reported as agents inducing yellow speckle. Analyses of samples collected in Napa Valley detected GYSVd-1 in every vine from field sources of the "mystery disease". Symptoms usually associated with fanleaf degeneration such as shot berry and vein-banding were found in vines which tested positive for both fanleaf and viroids. Typical vein-banding symptoms were observed on Sauvignon blanc and Cabernet Sauvignon vines which contained both grapevine viroids and fanleaf in a controlled field experiment in the central valley of California in the summer of 1994. However, symptoms were not pronounced on these vines the next summer. Evidence that the active agent, GYSVd, is contained in nonsymptomatic vines was obtained by exposing propagated vines to high temperature and continuous light. Under these conditions of excess temperature and light, vines which contained only fanleaf were nonsymptomatic. Of the vines which contained viroids alone 27 of 40 (68%) were yellow speckle symptomatic, while vines which contained both agents displayed yellow speckle symptoms in 13 of 19 vines (68%). These data indicate that the causal agent of yellow speckle can be present in non-symptomatic field grown vines and under appropriate conditions disease expression is possible. Yellow speckle and vein-banding disease expression therefore, appear to be related to a stress complex of biotic, climatic, and cultural factors.



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