CAES
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PHYTOPLASMAS

Phytoplasmas are a type of tiny cell wall-less bacteria that parasitize the cells of plants. They are completely dependent on their hosts. Because of this, phytoplasmas cannot be contained in a pure culture and are therefore currently not formally published, instead given the interi taxinomic status of *Candidatus*.

Phytoplasmas are responsible for a diverse assortment of plant diseases, often called 'yellows.' Some are spread via cuttings from infested plants, and many are also spread via leaf-feeding insect vectors such as leafhoppers or psyllids. Insects ingest phytoplasma cells when feeding, which can be spread to new plants via subsequent feeding. Symptoms of phytoplasma infection often include yellowing of leaves, changes in normal growth patterns ('witches-brooms'), and other abnormal growth, such as leaves in the place of flowers. Stress and decline caused by phytoplasmas can eventually lead to the plant's death.

Because it cannot be cultured and many disease symptoms caused by it are ambiguous, the only way to diagnose a phytoplasma infection is via genetic testing of symptomatic plant tissues.

Candidatus Phytoplasma australiense, the causal agent of Australian Grapevine Yellows, has been reported in a number of diverse hosts, including *Vitis*, *Solanum, Prunus, Rubus*, and *Cucurbita*. Widely distributed in Australia, if introduced to the United States AGY would pose a significant risk to grape, as well as potentially many common horticultural crops. Symptoms include dieback at growing points, abnormally colored and shaped leaves, dieback of stems, and general stunting or rosetting.

Candidatus Phytoplasma vitis, or flavescence doree, has similar symptoms to other grapevine yellowing diseases. According to the Purdue Pest Tracker website, this includes "yellowed and curled leaves, drooping shoots, and lack of grape production are all symptoms. This disease can spread quickly throughout a grape vineyard and threatens wine production in several areas of Europe, particularly France."

The causal agent of Stolburs disease, *Candidatus Phytoplasma solani*, is also sometimes called black wood – 'bois noir.' This pathogen can be vectored by insects feeding on reservoirs such as nettle and bindweed, which then transfer the pathogen to nearby crops in subsequent feedings. Grape, corn, and other solanaceous hosts are susceptible to it.

Monitoring for the presence of grape phytoplasmas is part of the 2019 Farm Bill Survey. A visual survey for symptomatic

plant tissues is conducted on target crops, samples are sent for genetic testing.

Australian Grapevine Yellows Symptoms. Abnormal reddening of grape leaves.

Flavescence doree symptoms. Curling and reddening of leaves.