Blackberry Leaf Mottle Virus

a. Virus/pathogen name, including accepted acronyms and synonyms

Blackberry leaf mottle emaravirus, BLMV – Genus *Emaravirus,* Family *Fimoviridae*, Order *Bunyavirales* (ICTV online).

b. Host range, including resistance or tolerance within the crop hosts, alternate hosts

BLMaV has been reported from cultivated and wild blackberries. Experimentally, BLMaV was successfully cleft-grafted to black raspberry 'Munger' (*Rubus occidentalis*, L.)

c. Symptoms on crop host including varietal differences with images of symptoms when available

BLMaV can cause blackberry yellow vein disease symptoms in single infections in 'Ouachita' blackberry but is asymptomatic in 'Natchez' – yet but can cause severe symptoms when found in plants co-infected with other viruses. BLMaV is widespread and found in a significant number of blackberry yellow vein disease (BYVD)-affected plants. Symptoms observed include yellowing of the main veins, mottling, oak leaf patterns, and chlorotic ringspots. The disease affects fruit quality, yield, and causes plant decline.

d. Geographic distribution:

BLMaV has only been reported from cultivated and wild blackberries in the U.S. and particularly Arkansas, California. North Carolina, South Carolina, Florida, Oklahoma, Mississippi, and Georgia.

e. Means of spread:

Rubus species are propagated vegetatively in commercial settings and viruses may be introduced at any point during germplasm development, propagation, or fruit production. BLMaV can be spread through vegetatively propagated hardwood cuttings. BLMaV was experimentally transmitted onto 'Ouachita' blackberry plants by the eriophyid mite *Phyllocoptes parviflori* (Acari: Eriophyoidea) (Druciarek et al., 2024),

f. Recognized diagnostic tests with cited references:

Full genome sequences have been obtained for BLMaV, enabling their detection by reverse transcription-polymerase chain reaction (RT-PCR) (Hassan et al., 2017) and quantitative RT-PCR (Hassan and Tzanetakis, 2019).

g. Sampling recommendations for each pathogen including timing and tissue to be sampled

BLMaV may show seasonal differences in titer in leaf tissues and different parts of the plant. This is why samples should be taken from young but fully developed leaves. Sampling from different sites of a plant increases the chances of detection in case of uneven virus distribution. Recent surveys from South Carolina's commercial settings showed that BLMaV movement in the field peaked in June and July (Poudel et al., 2018). It was suggested that wild blackberries in the vicinity serve as a source of the virus and host vectoring mites, thus facilitating the movement of BLMaV within the crops. Therefore, wild blackberry plants in the vicinity should also be tested. The best time to scout for eriophyoid mites on blackberries is April-June and September-October (northern hemisphere). *Diptacus rubuscolum* is a free-living mite, vagrant on the lower leaf surface. Adult mites are 230-280 µm long and light-brown to dark-brown in color. Due to small size, the visual examination of eriophyoids itself requires a means of magnification directly on plant samples or after mite extraction by means of a washing and sieving protocol (Law et al., 2020; Monfreda et al., 2007). Similar to many other mite species, *D. rubuscolum* cannot be identified based on generic aspects such as body color and size, a number of legs, etc. Due to the mite's small size, species identification of a specimen requires slide preparation and phase contrast microscopic examination (de Lillo et al., 2010). Trained and experienced personnel can complete this identification procedure in a few hours. It is also possible to DNA-barcode collected mite specimens (Druciarek et al., 2019)

h. Management strategies for the pathogen and the vector(s) of the pathogen

The main management strategy is the use of certified virus-tested planting material. The small size of eriophyoid mites makes it difficult to monitor their population density in the field. There are no studies showing the effectiveness of commercially available acaricides against eriophyoid mites on blackberries. If chemical control is used, acaricides should be selective and not harmful to the natural enemies of Eriophyoidea, e.g., *Phytoseiidae*. Crop rotation can assist in controlling virus spread. Removal of native *Rubus* vegetation in the vicinity of commercial operations is highly recommended.

i. References

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