

## Strawberry Virus Dissemination in Arkansas

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### ABSTRACT

Fulton, J. P., and Moore, B. J. 1982. Strawberry virus dissemination in Arkansas. *Plant Disease* 66: 847-848.

A recent survey of commercial strawberry plantings in Arkansas revealed a low incidence of veinbanding virus and a much higher incidence of pallidosis virus. It is suggested that these viruses are indigenous and persist in hosts other than cultivated strawberry. Mottle virus, which formerly moved into virus-free plantings, has been eliminated by the regular release of virus-free plants.

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A strawberry plant certification program has been in effect in Arkansas for more than 25 yr. Only stocks indexing free of known viruses have been released under this program; presently, plants from these stocks are used in essentially all commercial plantings. Shortly after

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the certification program was initiated, a survey was conducted to determine which viruses were moving into the virus-free plantings (2). Now, after 25 yr of releasing virus-free stocks, another survey was conducted to determine the current extent of virus movement. The results of this survey are presented in this paper.

### MATERIALS AND METHODS

Six strawberry plants were collected at random in each of 19 commercial plantings in northwest and north central Arkansas. Plants in all of these plantings had, at some time in the past, originated from Arkansas certified plants. Some were only 2 yr from Certified Purple Tag

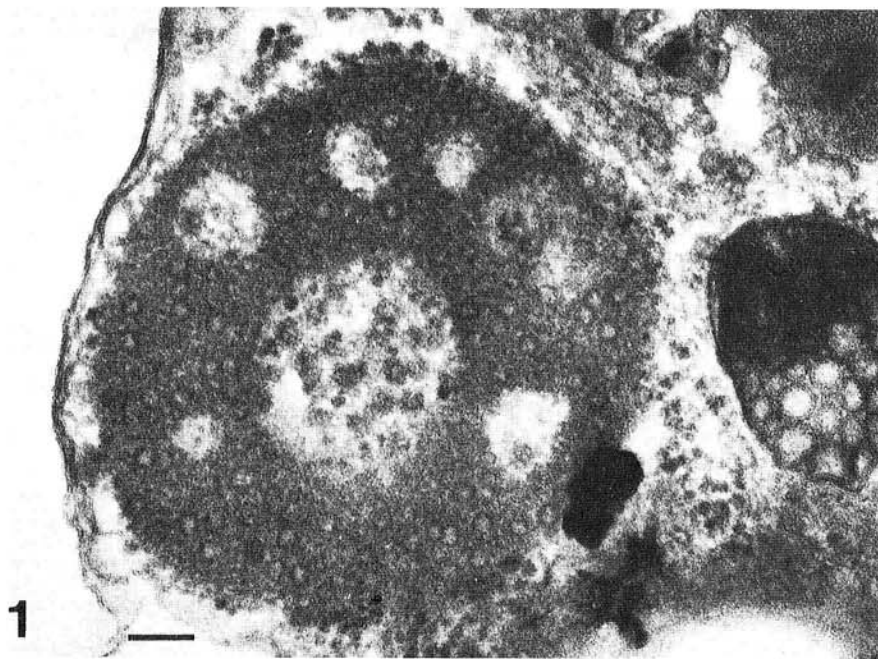
plants, whereas others were as much as 12 yr from this grade. In some cases, the stock had passed through the hands of several growers.

Plants were indexed for viruses by grafting excised leaves onto indicator plants EMK (*Fragaria vesca* L.) and UC-10 and UC-11 (*F. virginiana* Duchesne). EMK is a good indicator of the mottle, veinbanding, latent C, and crinkle viruses; UC-10 and UC-11 clones detect pallidosis virus (1). Indexing was done in a greenhouse during the winter. Indicator plants were observed for symptoms for 6 wk following grafting.

Pallidosis and latent C are caused by graft-transmissible agents of unknown nature. Several of the strawberry viruses have not been purified and adequately characterized. All of these transmissible agents are referred to as viruses in this paper.

### RESULTS AND DISCUSSION

Only pallidosis and veinbanding viruses were found in this survey.



**Fig. 1.** Characteristic caulimovirus-induced inclusion body in the cytoplasm of a strawberry leaf showing symptoms of veinbanding. The inclusion is composed of viruslike particles embedded in an electron-dense matrix with electron-lucent areas where the particles are well defined ( $\times 82,500$ ). Bar represents 100 nm.

Pallidosis virus was detected in 65.6% of the plants indexed, and veinbanding virus was detected in 12.5% of the plants; no virus was detected in 21.9% of the plants. Plants were recorded as positive for pallidosis virus when UC-10 and UC-11 indicators developed viruslike symptoms, but EMK grafted from the same plant developed no obvious symptoms. Veinbanding virus produced typical chlorotic banding of the primary and secondary veins of leaves of EMK. Identity of this virus was confirmed by electron

microscopy of thin sections of selected specimens, which revealed typical caulimovirus inclusions (3) (Fig. 1). The incidence of pallidosis was probably higher than 65.6% because plants with veinbanding may also have been infected with pallidosis virus. No means of separating or detecting a mixture of these two viruses was readily available.

No pattern to the occurrence of these two viruses was evident. Pallidosis was found in all plantings except one, and veinbanding was present in some plants

in five of the 19 plantings tested. Failures to detect the viruses may have resulted from the limited sample sizes.

In our previous survey (2), the mottle virus was the one most commonly moving into virus-free plantings. Veinbanding virus was also found, but at a much lower incidence. In that survey, however, virus-free plants were planted adjacent to or near large plantings known to be contaminated with a virus complex that included mottle, veinbanding, and several other strawberry viruses. Results of the current survey suggest that mottle virus has disappeared but that veinbanding virus has persisted at the same low level. The probable source of mottle virus was the contaminated commercial plantings. When this source was eliminated by the regular release of virus-free plants, the virus disappeared. The fact that veinbanding virus persisted at the same low level suggests that it is indigenous in this area and probably persists in a host other than cultivated strawberry.

We were not aware of the pallidosis virus at the time of our previous survey. Plants indexing free of this virus have been released for a much shorter period of time. Nonetheless, the results suggest that this pathogen is also persisting in a host other than cultivated strawberry, and that it has an efficient, although unknown, vector.

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