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Project to characterise avocado viruses

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In 1983 Jordan *et al* (1983) in California reported the presence of several species of double-stranded RNA in various avocado cultivars, indicating the presence of viruses. Attempts were made to identify the cause of avocado black-streak disease, but none of the three virus-like RNA's found and named AV1, AV2 and AV3, were clearly associated with that or any other disease.

The presence of these three agents in some avocado cultivars in South Africa was reported by this laboratory (Da Graca & Trench, 1985), while AV1 and 3 have also been detected in Israel (Bar-Joseph, Giband &Yesodi, 1987).

Further work to characterise these agents is required, partly for academic reasons, but also to develop reliable indexing tests in case any are shown to be responsible for any abnormality, such as low or uneven yield. However, no such work has been reported.

Conventional extraction methods in California have failed to detect viruses with any reliability in one case a few isometric particles were observed in the electron microscope (Dodds, 1983 personal communication).

Two other approaches are being tried in this laboratory, both involving serological techniques. The first is to screen extracts of infected and non-infected avocados for proteins; if any are present only in the former, antibodies will be raised against them and used to trap virus particles by serologically-specific electron microscopy (SSEM). This technique was recently successfully used for citrus ringspot virus (Derrick *et al,* 1988). Initial attempts have not shown up any such proteins.

A second approach will be to raise antibodies against crude extracts, and then remove host proteins by absorbing them onto these antibodies, leaving any viral antibodies free for SSEM and other studies.

Because the viral dsRNA's are in different cultivars (AV1 and 3 in Fuerte, AV3 in Hass and AV1 and 2 in A11/6), it would be desirable to have them all in one cultivar. Several Duke 7 rooted cuttings, which have been indexed negative for dsRNA, have been inoculated with the various sources. AV3 is reportedly not graft transmissible (Jordan, Dodds & Ohr, 1983), thus it should be possible to separate AV1 and AV2 from AV3. At present, there seems to be no way of transmitting AV3 to Duke 7. AV3 is seed transmissible and this, together with its dsRNA patterns, bears strong resemblance to the cryptic viruses, a group of (Bar-Joseph *et al,* 1987) dsRNA viruses with isometric particles which do not appear to cause any diseases (Boccardo *et al,* 1987).

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