Pathogen of the month – February 2010

3rd Birthday Edition

FEB10

Zucchini yellow mosaic virus (ZYMV)

Fig. 1. *Zucchini yellow mosaic virus* - Knobbly and distorted jarrahdale pumpkin fruit (a); Severe mosaic and blistering on rockmelon leaves (b); Distorted and smaller zucchini fruit (left), healthy (right) (c). Photo credits: Brenda Coutts, DAFWA.

Disease: *Zucchini yellow mosaic*

Classification: F: *Potyviridae*, G: *Potyvirus*.

Zucchini yellow mosaic virus (ZYMV) has flexuous filamentous particles, 750nm long consisting of a single-stranded RNA of about 9600 nucleotides. It is transmitted non-persistently by a number of aphid species including the melon (*Aphis gossypii*) and green peach (*Myzus persicae*) aphids. ZYMV can also be spread by sap from infected plants contacting wounded healthy plants and is seed-borne at low levels. There are many strains of ZYMV and these vary in symptom severity and ability to overcome ZYMV resistance in commercial cucurbit cultivars.

Host range: It is a major pathogen of members of the family Cucurbitaceae. The main cultivated host species include *Cucumis melo* (rockmelon), *C. sativus* (cucumber), *Cucurbita pepo* (zucchini), *C. moschata, C. maxima* (pumpkin) and *Citrullus lanatus* (watermelon). Native (eg. *Mukia* sp.) and wild cucurbits (eg. *Citrullus lanatus*, Afghan melon and *Cucumis myriocarpus*, paddy melon) also become infected naturally. Very few non-cucurbitaceous natural hosts of ZYMV have been identified.

Distribution: ZYMV was first identified in 1981 in Italy and France, but symptoms were first described in zucchini plants in 1973. It has since been identified in more than 50 countries on 5 continents where cucurbits are grown. In Australia, ZYMV symptoms were first described in 1981, but the virus itself was not identified until 1987. It is currently found infecting cucurbit crops in NSW, NT, Qld and WA.

Impact: ZYMV causes one of the most economically important diseases of cucurbit crops. When crops are fully infected before fruit set, severe yield losses of up to 95% occur. These losses reflect reduction in the weight of fruit produced and also quality defects consisting of misshapen and discoloured fruit rendering them unmarketable. Infected fruit also have reduced shelf-life.

Key distinguishing features: The leaf symptoms appear as severe mosaic, deformation, blistering, and reduced size. Infected plants are stunted. Fruit symptoms include knobbly areas which cause prominent deformation, and uneven skin colouring. Symptoms on cucurbit plants are similar to those caused by infection with *Papaya ringspot virus*, *Watermelon mosaic virus* or *Squash mosaic virus.* ZYMV identification in symptomatic samples is by ELISA using specific antibodies.

Management: Strategies to reduce the spread of ZYMV include removal and destruction of old cucurbit crops, any wild or volunteer cucurbit plants, and roguing out any cucurbit plants showing virus-like symptoms, especially prior to fruit set; avoiding sequential side-by-side plantings, planting a tall non-host border crop around the crop (plant four weeks prior to cucurbits); good hygiene practices through use of foot baths and wash down of equipment and; use of ZYMV-resistant cultivars when available. However, resistance breaking strains occur so resistance should never be used alone.

Further Reading: Coutts (2006) Virus diseases of cucurbit crops. DAFWA Farmnote No 166; Coutts et al. (2005) *Australian Journal of Agricultural Research* **56**:847-858; Desbiez and Lecoq (1997) *Plant Pathology* **46**:809-829;

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