

## SQUASH MOSAIC

Squash mosaic, caused by *Squash mosaic virus*, is an important virus disease of cucurbits. Squash mosaic was first reported in 1916, and its spread via seed was reported in 1934. *Squash mosaic virus* (SqMV) is also transmitted by cucumber beetles. Extensive use of virus-free seeds has greatly reduced its economic importance.

The virus is known to occur in places where infected seeds provide effective means of local and long-distance dissemination. Field spread of this virus depends on the presence of cucurbit beetles. Main hosts of SqMV are squash and melon.

### Symptoms

Symptoms caused by SqMV are variable and depend on the host species and cultivar. Generally, infected plants respond with a variety of symptoms, including green veinbanding, mosaic, mottle, blisters (Figure 1), ring spots, and protrusion of veins at the leaf margins (Figure 2). Infected plants of some squashes may develop prominent enations, or outgrowths, on leaves. SqMV strains can be detected and differentiated from other cucurbit viruses by ELISA or RT-PCR.

### Disease Cycle

Experimentally, SqMV can infect 15 species of plants in 11 genera,



Figure 1. Squash mosaic, caused by *Squash mosaic virus* (SqMV) of squash. (Courtesy Wikipedia)



Figure 2. Squash mosaic, caused by *Squash mosaic virus* (SqMV) of melon. (Courtesy R. Providenti)

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but its natural host range is confined to Cucurbitaceae and some members of Chenopodiaceae. The virus is of particular importance in squash and melon species, in which most infection can be traced to infected seeds. The virus is carried within the seed, not on the seed coat; therefore, it cannot be eliminated by standard surface treatments of seeds that are effective against some other seedborne pathogens. Seed transmission rates have been reported to be 0.14 – 10%, but higher percentages have also been documented.

The major insect vectors of SqMV are the western striped cucumber beetle, *Acalymma trivittatum*, and the spotted cucumber beetle, *Diabrotica undecimpunctata howardi*. These species acquire the virus within 5 min and can retain it for approximately 20 days. SqMV does not multiply in the vector, but it can be recovered from regurgitation fluid, feces, and insect hemolymph.

## **Disease Management**

Seed producers have been successful in limiting the presence of SqMV in squash and melon seed stocks; however, some seed transmission does occur periodically. Certification of virus-free seed remains an important and effective means of limiting the virus. Field spread of the virus can also be reduced by the applications of insecticides to control the beetle vectors. Resistance to SqMV has been developed by genetic engineering.