



## Disease caused by luteovirus

### **Symptoms**

Infected plants have interveinal clearing on young leaves and dark green veins on old leaves. Leaves tend to become thicker and more rigid while leaf edges roll upwards. Shoots also tend to become rigid and point upwards. Later, leaves develop a dark green color with “metallic” or “plastic” glare. Usually, the oldest infected leaves develop patch-wise chlorosis, whereas leaves of uninfected plants show a more even yellowing due to normal senescence. Reduction or absence of female flowers is common. Infection at an early stage of plant development can cause plant stunting.

### **Causal agent and insect vector**

Luteovirus. At present two related diseases, locally known as Namamarako in the Philippines and Mara Ba in Thailand, have been identified. The two viruses are similar to *cucurbit aphid-borne yellow virus* (CABYV). Two species of aphid, *Aphis gossypii* (the major vector) and *Myzus persicae*, are vectors, transmitting the virus in a persistent manner.

### **Distribution**

Likely present in most countries in Asia in the tropical and sub-tropical belt. Besides the Philippines and Thailand typical luteovirus symptoms have been observed in Vietnam, Indonesia, India, Sri Lanka, and China.

### **Host range**

Besides bitter melon, other host crops include wax gourd, watermelon, cucumber, zucchini, ridge gourd, and snake gourd. Some common weeds found in bitter melon fields including *Cyperus iria*, *Eclipta prostrata*, *Portulaca oleracea*, and *Trianthema portulacastrum* can also host the virus without showing any visible symptoms.



▲ Bitter gourd



▲ Bitter gourd



▲ Bitter gourd



▲ Bitter gourd



▲ Bitter gourd



▲ Bitter gourd

### *Conditions for disease development*

Warm and humid conditions favor aphid population development resulting in high aphid numbers and higher virus infection risks.

### *Disease management*

**Chemical control** Use a conventional broad spectrum insecticide such as cypermethrin or imidacloprid to control aphids. Several natural products such as azadirachtin (extracted from neem tree seeds) and pyrethroids can suppress aphid populations leaving limited chemical residues. Thorough spray coverage on the underside of leaves is important for effective pest control.



▲ Bitter gourd



▲ Bitter gourd



▲ Bitter gourd

***Field management*** Monitor the crop regularly for initial aphid infestation and virus symptoms. By placing yellow sticky traps around the field, aphid and other insect populations can be monitored more efficiently. Sanitation is the primary means of control. Infected plants and plant debris should be removed from fields to prevent the spread of the virus. Prune leaves with aphid colonies and dispose of them. Eradicate wild cucurbits and weeds, which serve as alternate hosts. Reflective mulches will repel insect vectors and reduce weed development in the crop. Use resistant or tolerant varieties where available. It is recommended to raise seedlings under aphid-proof screen.