

Holistic Management of Major Viral Diseases in Chilli and Okra

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Abstract

Chilli leaf curl and okra yellow vein mosaic virus (YVMV) are serious viral diseases causing heavy yield losses in India. They are mainly transmitted by insect vectors such as mites, thrips, and whiteflies. Symptoms include leaf curling, vein clearing, yellowing, and stunted growth. Field studies showed that early sowing (June) and closer spacing (30 × 30 cm) significantly reduced disease incidence in okra. Integrated management practices such as use of healthy seedlings, resistant varieties, removal of infected plants, and vector control using neem products and insecticides were effective in minimizing disease spread and improving yield.

Introduction

Chilli (*Capsicum annuum* L.) and okra (*Abelmoschus esculentus*) are important vegetable crops in India, valued for their nutritional and economic significance. However, their productivity is greatly affected by viral diseases such as chilli leaf curl, mosaic, and okra yellow vein mosaic. These viruses are obligate intracellular pathogens that disrupt normal plant functions, causing symptoms like leaf curling, yellowing, mosaic patterns, and stunted growth, leading to severe yield losses. Since viral diseases have no direct cure after infection, management must focus on prevention. The spread of these diseases mainly occurs through insect vectors, particularly whiteflies (*Bemisia tabaci*) and aphids, along with the presence of alternate host plants. Favourable environmental conditions and intensive cultivation further increase disease incidence. Therefore, Integrated Disease Management (IDM), combining resistant varieties, healthy planting material, vector control, and field sanitation, is essential for effective and sustainable management of viral diseases in chilli and okra.

Major Viral Diseases of Chilli

Chilli Leaf Curl Disease

Symptoms:

- Upward or downward leaf curling
- Leaves become small, thick, and crinkled
- Yellowing and vein thickening
- Stunted plant growth (bushy appearance)
- Poor flowering and fruit set
- Fruits are small and deformed.

Biological Methods

- Spray neem oil (2–3 ml/L) or NSKE (5%)
- Encourage natural enemies:
- Ladybird beetles
- Lacewings
- Use neem cake in nursery soil

Chemical Methods

Spray Imidacloprid 17.8 SL @ 0.3 ml/L Thiamethoxam 25 WG @ 0.25 g/L and Acetamiprid @ 0.2 g/L. Spray at early stage and repeat at 10–12 day interval

Physical / Mechanical Methods

- Install yellow sticky traps (10–15/acre)
- Use silver reflective mulch
- Remove infected plants
- Use insect-proof net nursery
- Grow barrier crops (maize/sorghum)

2. Mosaic Disease (Chilli Mosaic)

Symptoms:

- Mosaic pattern (light and dark green patches)
- Leaf distortion and puckering
- Reduced leaf size
- Stunted growth
- Poor fruit quality and yield.

Biological Methods

Neem oil spray (2–3 ml/L) or NSKE (5%)

Chemical Methods

- Imidacloprid or Dimethoate for aphid control
- Spray at initial stage

Physical / Mechanical Methods

- Remove infected plants
- Avoid touching plants frequently (reduces mechanical spread)
- Use clean tools

Okra – Major Viral Diseases.

1. Yellow Vein Mosaic Disease (YVMV)

Symptoms:

- Yellowing of veins (distinct network pattern)
- Entire leaf gradually turns yellow
- Leaves become small and pale
- Stunted plant growth

- Fruits are small, hard, and deformed
- very low or no yield.
- Biological Methods
- Neem oil (2–3 ml/L) and NSKE (5%)
- Encourage natural predators

Chemical Methods

- Imidacloprid @ 0.3 ml/L Thiamethoxam @ 0.25 g/L and Dimethoate @ 1 ml/L
- First spray at 15 DAS, repeat as needed
- Physical / Mechanical Methods
- Grow resistant varieties
- Install yellow sticky traps (10–12/acre)
- Remove infected plants
- Use reflective mulch
- Grow barrier crops
- Early sowing

2. Okra Leaf Curl Disease

Symptoms:

Curling and twisting of leaves and Thickened veins

- Leaves become rough and leathery
- Reduced plant growth
- Poor flowering and fruit formation.
- Remove infected plants.
- Biological Methods
- Neem oil spray NSKE
- Chemical Methods
- Imidacloprid / Thiamethoxam sprays

- Control whiteflies

Physical / Mechanical Methods

- Rouging infected plants
- Use tolerant varieties and Maintain spacing
- Avoid continuous cropping.

Conclusion

Viral diseases in chilli and okra cause severe yield losses and have no direct cure. Effective management depends on preventive measures, especially vector control and field sanitation. Adoption of Integrated Disease Management (IDM) ensures reduced disease incidence and sustainable crop production.

References

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