

TOSPO Viruses- Impatiens Necrotic Spot Virus (INSV) and Tomato Spotted Wilt Virus (TSWV)

What plants are affected?

1. Plants that are not hosts of TOSPO viruses include rose, geranium and poinsettia.
2. Some of the many crops that are hosts are listed below. The most commonly found affected in greenhouses include begonia, Cineraria, Cyclamen, gloxinia, and New Guinea impatiens.

Flowering Crops			Vegetables/Herbs	Foliage Plants
Amaranth	Cyclamen	Peony	Basil	African Violet
Amaryllis	Dahlia	Petunia	Bean	Aglaonema
Anemone	Delphinium	Phlox	Broccoli	Aphelandra
Aster	Exacum	Poppy	Cauliflower	Bird's Nest Fern
Baby's Breath	Gladiolus	Primrose	Celery	Cordyline
Begonia	Gloxinia	Ranunculus	Coriander	Dracaena
Calceolaria	Gypsophila	Salvia	Cucumber	Episcia
Campanula	Impatiens	Snapdragon	Lettuce	Hoya
China Aster	Larkspur	Statice	Parsley	Lipstick Vine
Chrysanthemum	Lisianthus	Stephanotis	Pea	Maranta
Cineraria	Lupine	Sweet Pea	Pepper	Peperomia
Columbine	Marigold	Verbena	Spinach	Swedish Ivy
Cosmos	Nasturium	Zinnia	Tomato	Syngonium

Source of the Virus

1. Weeds must be eliminated both inside and surrounding the production area. The virus can infect a huge range of both cultivated and weed plants. Thrips feeding on infected weeds easily move the virus into the crop.
2. Examine new crops as soon as they come in. One of the easiest ways for TOPSO viruses to become established is through infected plant materials. Symptoms are very hard to categorize since they are different for nearly every crop produced. Typical signs are white, yellow or tan ring spots, distortion, black patches or spots (that are not always dead), stunting, mottling and crinkling to name a few. Sunken bands of wavy black or tan markings are common on some crops.

Confirming the diagnosis

1. You can send samples to Agdia in Elkhart, Illinois, for testing directly or you can purchase a kit from them and do your own test.
2. Throw away all plants with TOPSO viruses immediately.

Vector Management

1. Monitor the crops for thrips. *Frankliniella occidentalis* (Western flower thrips) is the most common but *Thrips tabaci* (onion thrips) is also a common vector. Western flower thrips have a life cycle of about 14 days when temperatures are 85F. They live the longest, however, when the temperature is 70F.
2. Use yellow or blue sticky cards that are placed one per 1000 square feet of production area and at doors and vents where thrips may enter the structure. Check these cards every 7 days.
3. When an outbreak occurs, use 2-3 sprays 5 days apart to break the life cycle. Alternate products between insecticide classes every 2 weeks. Use a very fine droplet size or smokes or fogs to penetrate areas where thrips hide (flowers especially).
4. Finding TOSPO viruses before they become established in the crop is the best idea. You can use indicator plants to determine whether or not the thrips feeding in your crop have the virus. Use Calypso, Super Blue Magic or Summer Madness Petunias as indicator plants. Place a yellow card (not sticky) in the pots to attract thrips to the indicator plants for feeding. Feeding scars caused by TOSPO virus infected thrips have a brown rim and may turn into small (1/8 to 1/4 inch), tan or brown spots.