

Pest control should consist of an integrated pest management (IPM) system which relies on efficient use of all appropriate control strategies. Action is taken to prevent problems and suppress damage levels without reliance solely on chemicals. Effective IPM consists of four basic principles: *exclusion* of the pest from the field, *suppression* of pest levels below an economic threshold, *eradication* of certain pests where deemed absolutely necessary, and *plant resistance* in cultivars of crop plants.

To carry out these principles, several steps are taken: *identification* of key pests and beneficial organisms, *preventative cultural practices* to minimize pest development, *pest population monitoring* by trained field scouts, *prediction* of loss and risk to determine when levels of yield and quality will be threatened, and *action decision* on what control measure is warranted. All sound IPM programs include an evaluation phase to assess the level of success. Details on IPM can be found in "IPM, an integrated pest management primer," University of Florida Cooperative Extension Miscellaneous Publication IPM-1, 1978.

Nematode control

Tomatoes are susceptible to injury from sting, stubby-root, awl, stunt, reniform, dagger, and root-knot nematodes among others. The most important nematode problems are root-knot in sand and Rockdale soils, and stubby-root and sting in sands. Nematodes can be managed by application of one or more of the following techniques: clean cultivation, crop rotation, flooding, soil fumigation and nematicides. Soils of known nematode infestation should be avoided or treated with an approved fumigant or nematicide.

With the continuing reduction in chemicals available for nematode control, research is being conducted on alternate, non-chemical means of control. One method, solarization, might have promise for small-scale use. This method involves applying clear polyethylene on the prepared bed for at least 4 to 6 weeks. The accumulated heat from sunlight raises soil temperature enough to destroy many soil-borne tomato pests.

For more information on nematode assays and for chemical control recommendations, consult the Nematode Control Guide. Nematode Sample Kits, which contain instructions and packing materials for collecting and submitting samples to the Nematode Assay Laboratory in Gainesville, are available from the county Extension office.

Disease control

Tomatoes are subject to attack from many disease-causing organisms including fungi, bacteria, and viruses. In addition many physiological disorders can cause serious losses in tomato crops. Below is a general description of the major tomato diseases. For specific chemical control measures, consult the tomato disease control chart in the Disease Control Guide. More information on the diseases is available (2, 10, 11, 12).

Bacterial Soft Rot. This disease is caused by a bacterium, *Erwinia carotovora* pv. *carotovora*, which infects stems, petioles, and fruits. On the fruit, small water-soaked spots appear which enlarge rapidly, converting the fruit into a soft, watery mass. The disease is particularly troublesome in storage or shipping.

Control of the disease involves procedures which minimize wounding fruit during harvesting and packing. Follow correct washing procedures using chlorinated water. Tomato varieties differ in susceptibility to soft rot. Flora-Dade cultivar is less prone to the disease than other cultivars. Consult Plant Pathology Fact Sheet No. 12 for more information.

Bacterial Speck. Caused by *Pseudomonas syringae* pv. *tomato*, this disease is often difficult to distinguish from bacterial spot since both diseases can occur simultaneously. Bacterial speck lesions appear as numerous, tiny, dark brown spots less than one-sixteenth of an inch in diameter and usually do not penetrate deeper than the fruit epidermis. Speck lesions are usually smaller than spot lesions and do not exhibit the raised, scab appearance of spot lesions.

Since this disease is seed borne, control of speck begins with disease-free seed and transplants. Control of speck in the field is difficult. Destroy tomato plant residues and avoid double-cropping. Consult Plant Pathology Fact Sheet No. 10 for more information.

Bacterial spot. This disease, caused by *Xanthomonas campestris* pv. *vesicatoria*, can often be confused with young early blight or gray leaf spot lesions. Bacterial spot lesions on leaves are brown, irregularly shaped, and greasy in appearance. They are rarely more than 1/8 inch in diameter. Spots lack the concentric ring appearance of early blight and are less uniformly distributed than gray leaf spot.