Greenhouse Plants Get Sick Too

Plant doctors fight disease many ways

Plant pathologists focus on keeping plants healthy, because most plant diseases cannot be cured. Once the plant is sick, the pathogen is best controlled by combining several management practices.

Management Practices

Regulatory Example

Enforce quarantines to prevent the spread of pathogens.

Physical Example

Keep pests out. Grow only healthy plants and prevent disease-carrying insects from contacting plants.

Chemical Example

Use chemicals to kill pathogens, preventing them from infecting other plants.

Biological Example

Introduce organisms that eat pathogens, such as this nematode-trapping fungus.

Cultural Example

Keep foliage dry. A drier environment is less conducive to disease and reduces the spread of pathogens.

One unbridled pathogen can wipe out greenhouses

A pathogen capable of destroying many types of plants can damage a whole industry. Northern root-knot nematode, one of the most notorious flexible eaters, easily over-winters in greenhouse plants and in the soil, multiplying in numbers over time.

Preying on over 2,000 kinds of flowering plants and vegetables, this tiny worm causes major economic hardship for ornamental plant and vegetable growers across the northern United States and Canada.

Courtesy Lonnie Boden

Courtesy Jonathon Eisenback

Nematode robs a plant's vitality

Nematodes are the most numerous animal on the planet. Root-knot nematodes live and feed within the roots of plants. Wielding a tiny, hollow dagger like a straw, the pathogen draws nutrients from its host. The weakened plant lives, but usually lacks energy to flower or produce fruit.

3 Using a stylet like a straw, the nematode feeds on the plant.

4 Fluid injected by the nematode through its stylet causes the plant to produce giant feeding cells.

2 Nematode enters plant root.

5 The cell and the nematode swell as they draw in plant nutrients, forming a knot or lump on the root.

6 A mature female nematode releases hundreds of eggs into an egg mass that protrudes from the root into the soil.

1 Juvenile nematodes hatch from eggs in the soil.

Photos used in this diagram courtesy Jonathon Eisenback

Scientist on the Spot

Courtesy University of Minnesota

Combined treatments fight disease best

"In combating root-knot nematode, we might combine several management practices. In making choices, we weigh each treatment's effectiveness and its potential cost to consumers and the environment.

For example, as an alternative to applying a *nematicide*, a chemical used to kill nematodes, we might heat the soil, a physical practice that produces the same result. Using a biological practice, we could, instead, introduce microorganisms that feed on nematodes.

Cultural practices would also help. In addition to developing nematode-resistant plants, getting rid of diseased plants and using only healthy plants for propagation can minimize the spread of nematodes."

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