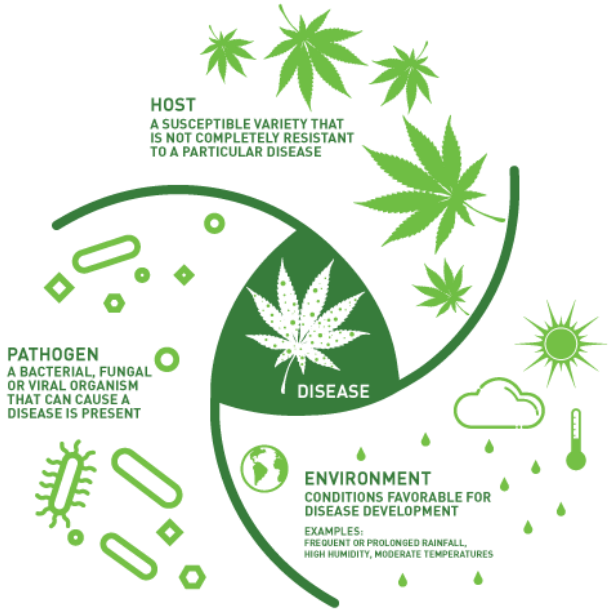
The Plant Disease Triangle



The three sides of the plant disease triangle represent the three components necessary for plant disease to occur. The three components are the host, the pathogen, and the environment. The host is the plant or part of the plant. The pathogen is the biological infectious agent (i.e., virus, fungi, bacteria, plant parasitic nematodes, phytoplasmas). The environment creates a condition conducive to the spread and/or manifestation of the disease.

Heating with a well-designed, installed low-intensity infrared system can, in many cases, help to interrupt disease-conducive environmental conditions, thus breaking the plant disease triangle. Two of the most common conditions that encourage many plant diseases are plant wetness/free moisture on plants and high humidity. These common greenhouse conditions are controlled very effectively with infrared heating.

Since infrared heating keeps surface temperatures above air temperatures, surface moisture is evaporated more rapidly than is possible with conventional heating systems. Low-intensity infrared heating therefore can help the grower to effectively control humidity– one of the key environmental factors leading to many diseases. This natural and beneficial "side effect" of elevated surface temperature happens with even-heating infrared systems and occurs without the grower applying any special techniques.

- THE EASE OF CONTROLLING FREE MOISTURE ON PLANTS IS A TREMENDOUS BENEFIT OF INFRARED HEATING.
- According to plant pathologists, free moisture/plant wetness promotes the following diseases:
- FUNGAL LEAF SPOTS — CERCOSPORA, ALTERNARIA, COLLECTOTRICHUM
- GRAY MOLD (BOTRYTIS BLIGHT)
- DOWNY MILDEW
- LEAF RUSTS
- BACTERIAL LEAF SPOTS — XANTHOMONAS, PSEUDOMONAS
- ROOT ROTS — PYTHIUM (BLACK ROT OR WATER MOLD), PHYTOPHTHORA (CROWN ROTS), RHIZOCTONIA, SCLEROTINIA SCLEROTIORUM (COTTONY ROT).
- PERIODS OF PLANT WETNESS, AS WELL AS WET POTTING MEDIUM ALLOW A SUITABLE ENVIRONMENT FOR ROOT ROTS. INFRARED HEATING KEEPS THE SOIL WARM TO HELP CONTROL PERIODS OF OVERLY WET SOIL MEDIUM.

Disease can also be spread by insects in wet environments. Certain insects thrive on algae growth on pots, soil, floors, or benches in wet environments. These insects can deliver bacteria or fungus-causing diseases like Thielaviopsis root rot (black root rot). Since infrared heating quickly evaporates moisture on all these surfaces, it can interrupt the wet environment and help to prevent the environmental conditions that attract insects. Insects that thrive in wet environments include fungus gnats and shore flies.