

Garden Column

May 1 2016

Dr. Robert Nyvall (rfnyvall@gmail.com)

Plant Diseases

These plants have spots and ugly things,
however did it happen?

I have no clue, these things just grew

and I don't know where they came from. - Shakespeare

Soon, plants will awaken from their winter siesta and new plants and seeds will be planted in the soil. Some will thrive, some will die, and some will have spots and malformations. Plant diseases are to the home gardener, the most puzzling thing that happens to plants. And to add to the bafflement surrounding this phenomenon is plant diseases can be confused with many other inanimate and animate factors such as herbicides and insects that also cause injury or death to a plant.

There are approximately two hundred thousand plant species in the world with more being discovered each year. Three thousand have at one time or another been used for food, three hundred are widely cultivated and twelve or less account for ninety five percent of the world's food supply. All of these food plants are susceptible to plant diseases.

Historically, plant diseases have significantly affected human history. If you're Irish and your ancestors came to the US in the 1850's or later. They came because of a plant disease that caused what has become known as the Irish potato blight or famine. The result was starvation and vulnerability to diseases such as typhus. One million Irish immigrated, mostly to the United States, and another million died of starvation and disease. What is not so well known is this plant disease also occurred in northern Europe causing many of our German and Scandinavian ancestors to immigrate.

Plant diseases caused other momentous historical events. Wheat stem rust, not insects, caused the Biblical seven years of famine resulting in the Israelites entering Egypt and into slavery. Russia has no warm weather seaport because of the Czar's army ingesting grain laden with ergot while on their way to conquer what is now Turkey. The Salem Witch trials were the result of the accusatory young girls eating breads with large quantities of ergot. The description of "red" bread in the chronicles is a typical symptom of rye bread "laced" with ergot. Southern corn leaf blight, a fungus-caused disease, in the 1970's caused millions of dollars worth of damage to corn world wide and in the United States and of late, new strains of potato late blight are returning to some potato-growing areas.

The causes of plant diseases are remarkably similar to those of humans and animals. A plant disease is quite simply the result of an interaction between a plant and a pathogen that results in harm to the plant. Examples of plant pathogens are bacteria, fungi, nematodes, phytoplasmas, and viruses with fungi the most common cause

resulting in about 75 percent of all diseases. Caveats are the environment must be proper for the pathogen to grow and the plant host must be susceptible.

The symptoms of plant diseases are extremely variable. Typical fungal-caused symptoms are leaf and stem spots. Examples are apple scab and Septoria leaf blight of tomato. In the case of powdery mildew, a white powder-like material (the fungus spores) covers the leaves and stems. Fungi also cause seeds and seedlings to “damp off”. Typical symptoms are seeds become soft and “mushy” and seedlings are pinched and soft at the soil line. Control of fungus-caused leaf spots is the application of fungicides as a foliar spray or seed treatment to control damping off.

Plant wilting is also caused by fungi but also by some bacteria. The plant will initially become limp, turn yellow then gray and finally dies. This is caused by the xylem or water-conducting vessels of the plant becoming plugged by the pathogen or it's by products, resulting in water being unable to move up the plant. These diseases are normally caused by soil-borne pathogens that are either normally found in the soil, in infested plant residue that has been incorporated into the soil or vectored by insects. Similar symptoms are caused by drought or a misplaced herbicide.

Examples of wilt are cucumber wilt, Dutch elm disease, and oak wilt to name a few. In the case of cucumber wilt, the disease is caused by a bacterium that is introduced into the plant by striped cucumber beetles. Besides wilted plants, a good diagnostic technique is to cut an infected stem and slowly pull the cut ends apart. If this is bacterial wilt there will be a “string” composed of bacteria between the ends. Wilt is controlled by resistant varieties or in the case of the trees, fungicides injected directly into the plant

Viruses are either carried by several insect species that inject the virus into the plant while feeding or are seedborne. A common symptom of virus infections is distorted plants that are confused with some herbicide injury. Plants may be twisted, have mishapen leaves, or “shoestring” veination. One of the most common herbicides to cause this confusion is any product with 2,4-D as the active ingredient. There are numerous virus-caused diseases and a good way to separate the injury caused by viruses from that of herbicides is to look at the leaves. Virus infections will have leave veins in a somewhat “normal” position whereas herbicide injury will cause the veins to grow together.

Another common disease is aster yellows. This is caused by the aster yellows phytoplasma (a bacterium-like organism) that is vectored to the plant by the aster leafhopper. Aster yellows affects a number of plants but the home gardener is most likely to see the disease in their carrot patch. Leaves are misshapen and reddish to yellow in color. The roots are “hairy” and unsuitable for eating. This disease has no cure and affected plants should be removed immediately. Unfortunately the disease also affects a large number of other plants including cone flowers. In nurseries and high value areas insecticides can be used to control the leafhoppers.

Bloomers has a good supply of insecticides and fungicides for the home garden. Read the label to insure the proper chemical is being used to control the specific disease.