



Pest e-alerts



Entomology and Plant Pathology, Oklahoma State University
127 Noble Research Center, Stillwater, OK 74078
405.744.5527

Vol. 15, No. 27

<http://entopl.okstate.edu/pddl/pdid/>

July 29, 2016

Early Blight of Potatoes and Tomatoes

John Damicone, OSU Extension Plant Pathologist

I've observed an increase in early blight disease on tomatoes over the last few years and saw early blight on potatoes this spring as well. Typically the primary foliar diseases I have seen on tomatoes have been Septoria leaf spot, a fungal disease, and bacterial spot and speck, diseases caused by bacteria. Early blight is more common in humid areas with more rainfall than Oklahoma. It is a primary disease along the east coast and other humid production regions. Above normal rainfall and humidity, and moderate temperatures the past couple of years may be favoring early blight.

Early blight, caused by the fungus *Alternaria solani*, affects both tomatoes and potatoes. The fungus survives on old crop residue, tomato seed, and infected potato tubers where spores are produced which cause initial infections of new crops. Infection is favored by temperatures from 75 to 84°F and free moisture from rain or dew, although the disease may be active at warmer temperatures. Leaf spots appear on older leaves as small, circular to irregularly shaped dark brown spots. Lesions enlarge to about ½ inch in diameter and often form dark concentric rings within the spot imparting a target-like appearance to the spots (Figure 1 and 2).



Figure 1: Early blight on potato-note the target-like appearance of the larger leaf spots.



Figure 2: Early blight on tomato- note the target-like appearance of the spots.

The concentric rings within the spots are a diagnostic feature of early blight distinguishing this disease from other foliar diseases of potato and tomato. Spores produced in spots on disease plants provide abundant secondary inoculum for disease increase as the season progresses. Severely spotted leaves turn yellow, wither and die as plants defoliate from the bottom up (Figures 3 and 4).



Figure 3: Severe early blight on potato foliage.



Figure 4: Severe early blight on tomato foliage.

Stem and fruit lesions on severely disease plants are similar in appearance to leaf spots, dark brown to black in color with concentric rings and the production of dark moldy growth within fruit lesions. Prematurely defoliated plants are less productive and in tomato, fruit on defoliated plants are exposed to sunscald. Generally, yield loss is worse on plants affected early in crop development. *Alternaria* is a common fungal genus that can be found on almost any dead area of a leaf or stem. Saprophytic species almost always produce spores in chains and have short beaks. Conversely, spores of pathogenic species such as *A. solani* form singly and have long and slender beaks (Figure 5.).



Figure 5: Spores of *Alternaria solani* .

Control of early blight is mostly accomplished through a preventive spray program with fungicide, although cultural practices can help reduce disease development. Crop rotation with non-host crops and incorporation of diseased crop residue into the soil to hasten decomposition are beneficial practices for control of early blight as well as other diseases. An adequate level of nitrogen fertility in soil is associated with reduced severity of early blight. While maintaining high soil fertility is beneficial, over-fertilization can interfere with tomato pollination and fruit set so exceeding recommended fertilization rates should also be avoided. While I often read that manual removal (picking off) of diseased leaves is recommended for control of tomato diseases, this practice is not supported by research and can lead to enhanced spread of disease by mechanical transmission.

Fungicide spray programs beginning at bloom are effective in controlling early blight. Most spray programs rely on the protectant (group M) fungicides chlorothalonil or mancozeb. Chlorothalonil is available in numerous home garden formulations. For commercial farms, Group 11 fungicides such as azoxystrobin are highly effective but are prone to resistance development and are no longer effective in some areas where early blight pressure is severe. Some of the newer Group 7 fungicides also have good activity against early blight. For organic producers, some copper-based fungicides are OMRI approved and have activity against early blight, but generally must be sprayed more frequently than other fungicides. Plants should be sprayed on 7 to 14-day intervals depending on weather beginning before or shortly after symptoms first appear. Remember that fungicides act like paint to protect healthy foliage from infection and are not very effective in rescuing severely diseased plants. Consult the latest edition of the OSU Extension Agents' Handbook of Insect, Plant Disease, and Weed Control (Circular E-832) for a listing of home garden and commercial fungicides for tomato and potato disease control along with their Mode of Action (MOA) Group.

Plant Disease and Insect Diagnostic Laboratory

The pesticide information presented in this publication was current with federal and state regulations at the time of printing. The user is responsible for determining that the intended use is consistent with the label of the product being used. Use pesticides safely. Read and follow label directions. The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, and Title IX of the Education Amendments of 1972 (Higher Education Act), the Americans with Disabilities Act of 1990, and other federal and state laws and regulations, does not discriminate on the basis of race, color, national origin, genetic information, sex, age, sexual orientation, gender identity, religion, disability, or status as a veteran, in any of its policies, practices or procedures. This provision includes, but is not limited to admissions, employment, financial aid, and educational services. The Director of Equal Opportunity, 408 Whitehurst, OSU, Stillwater, OK 74078-1035; Phone 405-744-5371; email: eeo@okstate.edu has been designated to handle inquiries regarding non-discrimination policies; Director of Equal Opportunity. Any person (student, faculty, or staff) who believes that discriminatory practices have been engaged in based on gender may discuss his or her concerns and file informal or formal complaints of possible violations of Title IX with OSU's Title IX Coordinator 405-744-9154.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources.