

# PLANT DISEASE AND INSECT ADVISORY



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Vol. 3, No. 9

Website: <http://entopl.okstate.edu/Pddl/advisory.htm>

May 4, 2004

## Black Fly Emergence Richard Grantham, Dir. PDIDL



Simuliidae is a small family of blood sucking flies commonly known as black flies or buffalo gnats. Adult black flies are small insects that measure 2 to 5 mm in length, and possess a shiny thorax which is strongly convex, giving them a humpbacked, gnat-like appearance. Color ranges from black to various shades of gray or yellow.

Black fly larvae occur only in running water such as streams and rivers, and some only around springs or reservoir outlets. Some species breed successfully in irrigation ditches. When the adult emerges, it floats to the surface in a bubble of air and quickly flies away. Both males and females feed on nectar and the females of most species also require a blood meal for development of the eggs. Adults are often found several miles from the nearest known breeding area. They are commonly reported to move 7-15 miles and wind-aided migration of 90-150 miles have been reported in some cases. The most common species in Oklahoma appears to have two generations per year. One generation begins in October, the larvae overwinter, and the adults emerge in the spring. The generation that emerges in late April and early May is the largest and causes the greatest problems.

Black flies bite only in the daytime or early evening and do not enter buildings to bite. Humans as well as domestic animals may be viciously attacked. The eyes, ears, nostrils, wrists, and all exposed parts of the body of man are subject to attack. The extreme pain, itching, and the resultant local swellings, together with occasional severe complications, indicate the presence of an active allergin. In some individuals, the face, arms, and other exposed parts may be greatly swollen as a result of the bites; in others, effects other than blood loss may scarcely be noticeable.

Long sleeve shirts, long pants, and hats with screen netting over head help prevent feeding. Repellents containing DEET (N,N Diethyl-meta-toluamide) formulations should provide some degree of protection from black fly bites (see representative products below). Other formulations such as Skin-So-Soft Bug Guard Plus IR3535® Insect Repellent may work as well.

For additional info see: <http://entopl.okstate.edu/ddd/insects/blackflies.htm>



## Managing Bacterial Leaf Spots on Tomato

John Damicone, Extension Plant Pathologist

A sure sign of spring is the transplanting of tomatoes. It's also a good time to plan for a disease management program for tomato. Bacterial spot and bacterial speck have been the most common foliar diseases of tomato in recent years. It is assumed that these bacterial pathogens are introduced into a production site on contaminated transplants. These arise from contaminated seed. Only one of several thousand seeds may be contaminated, but spread can be extensive in transplant production where plant density is high and plants are frequently watered. Furthermore, the bacteria can be present on leaf surfaces of transplants without causing symptoms. Once the bacteria are established, the diseases often become a chronic problem within a production site through survival on residue of the previous crop, volunteer tomatoes, and solanaceous (nightshade) weeds. Symptoms of the two bacterial diseases are very similar (Fig. 1 and 2), and they resemble the fungal disease *Septoria* leaf spot (Fig. 3). In addition to causing premature leaf drop, the bacteria cause fruit spotting which renders affected fruit unmarketable.

A spray program is recommended for control of bacterial leaf spots, particularly where the diseases have been a problem in past years. Bacterial spot and speck are difficult to control, and the results may be visually disappointing. However, the recommendation is based on results of trials in Oklahoma that have demonstrated large yield increases where bacterial spot and speck are present. Copper hydroxide (eg. Kocide) and copper sulfate (eg. Cuprofix) are the most commonly used bactericides. These materials also act as protective fungicides and have activity on fungal diseases such as *Septoria* leaf spot. Tank mixing coppers with the fungicides maneb or mancozeb (eg. Penncozeb, Dithane, etc.) not only enhances control of fungal diseases, but also increases the release of copper ion into solution which may improve bacterial disease control.

Spray programs should be initiated about 2 weeks after transplanting or at first bloom and repeated every 7-days. The suggested rates for Kocide, maneb and mancozeb are 2 lb/A, or 2 tsp/gal for hand sprayers. Applications should be made in sufficient water to obtain uniform coverage. Avoid the use of mist blowers because coverage can be limited as multiple rows are sprayed, and the forced mist can actually increase bacterial spread. Plants should be sprayed to runoff where hand sprayers are used. Because of the 5-day preharvest restriction for maneb and mancozeb, copper alone can be used during harvest. Bravo may also be used in combination with copper where fungal diseases are a concern.



Fig. 1. Bacterial spot.



Fig. 2. Bacterial speck.



Fig. 3. Septoria leaf spot.

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### **Curly Top or No Curly Top? (That is the question)**

John Damicone, Extension Plant Pathologist

Curly top disease, caused by beet curly top virus (BCTV) was a widespread problem last year in tomatoes and peppers. On tomato (Fig. 4) the virus causes stunting, leaf curl, purple coloring in the leaf veins, and plant death. On peppers (Fig 5), the virus causes stunting, mild leaf curl, and plant death. The virus is spread by the beet leaf hopper as it samples plants in search of suitable host plants. The disease was a regional problem in 2003, as it caused severe losses in spinach in south Texas early in the year, and on peppers and tomatoes in Colorado, New Mexico, and Texas. What can we expect in 2004?

In the Pacific west where curly top has been a problem for many years, the disease is sporadic-severe some years and mild or non-existent in others. The cyclic nature of the disease is thought to be related to complex factors affecting leaf hopper numbers and migration, and sources of the virus which the leaf hoppers acquire. In other words, where lots of leaf hoppers have the virus

and are actively searching for food, virus epidemics are severe. Currently we do not know whether or not the virus and leafhoppers that affected the crop in 2003 were local or moved into the state from distant sources. Reports from Texas this year are that the disease was not a problem in the spinach crop this winter, and no virus has yet been observed in other crops.

We are evaluating some potential control strategies for curly top on tomato this year. At the Oklahoma Vegetable Research Station in Bixby, Brian Kahn (Hort & L.A) is evaluating four potentially resistant tomato cultivars obtained from a breeding program in Oregon. He is also evaluating the use of reflective plastic mulch which may serve to repel leafhoppers from landing in tomatoes. Jonathan Edelson (WWAREC) and myself are evaluating row covers, treatment of transplants with systemic insecticide (imidacloprid- Admire), and increased plant density (2 plants per transplant cell), both at Bixby and at the WWAREC in Lane.



Fig. 4. Curly top on tomato.



Fig. 5. Curly top on chilli pepper.

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