



# Georgia Extension Vegetable News

The University of Georgia

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## Bacterial Leaf Spot Control in Tomato & Pepper

David Langston

Extension Vegetable Pathologist - UGA

Growers of peppers and tomatoes have had a break from bacterial leaf spot on pepper and tomato for the past two years due to very dry growing seasons. Sure we have seen a few serious outbreaks but not widespread epidemics. A wet year this year could spell a change in bacterial spot severity and control.

Bacterial spot of both vegetables is caused by *Xanthomonas campestris* pv. *vesicatoria* (*Xanthomonas axonopodis* pv. *vesicatoria* on tomato in some newer publications). There are several strains that attack only one host and some that can attack both pepper and tomato. Spread and severity of bacterial spot is driven by weather in that warm (75-87° F), humid, wet periods favor the disease. Sources of inoculum for bacterial spot include weeds, crop debris, volunteer plants, and seed.

Control for bacterial spot in both pepper and tomato should be a multi-tactic approach utilizing: 1. Pathogen-free seed and transplants; 2. Seed treated with NaOH (clorox); 3. Crop rotation with non-host plants so that peppers/tomatoes are grown in the same field only every 3 - 4 years; 4. Deep plow or remove potentially infested plant debris; 5. Avoid working in wet fields; 6. Eliminate wild solanaceous host plants such as nightshade and ground cherry; 7. Use of preventive copper/EBDC tank mixes applied at least weekly; 8. Use varieties resistant to one or more races of the bacterial spot pathogen (mainly pepper containing the *Bs2* gene which confers resistance to bacterial spot races 0-3). 9. Application of the plant defense activator Actigard® on tomatoes.

There is much speculation concerning whether to use Actigard and/or copper-maneb sprays for bacterial spot suppression in tomatoes. Cost is a primary issue as Actigard generally costs \$15 - 40/acre per application while copper-maneb applications cost \$8 - 9/acre. Actigard can also cause some yield delay and does not seem to confer TSWV suppression in field trials conducted in Grady Co. Data from several states suggests that Actigard may be a more viable choice where copper resistant bacteria occur. However, Actigard has been shown to reduce bacterial spot as good as copper-maneb sprays in replicated field trials. Overall, more information is needed on copper sensitivity in GA bacterial spot populations before widespread use of Actigard can be fully utilized.

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## Shipping Sweet Corn to California

David Adams  
Extension Vegetable Entomologist - UGA

California has accepted Georgia's European corn borer trapping program that will allow growers the opportunity to ship sweet corn to the west coast. The proposal requires trapping, treatments, inspection and fee assessment for the service. The Georgia Department of Agriculture will administer the regulatory aspects of the program. Growers that are interested can contact the Barry Smith, Plant Protection Div. Of the Ga Dept of Ag in Tifton, GA at (229) 386-3464.

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## Soil Insect Problems

David Adams  
Extension Vegetable Entomologist - UGA

Problems associated with soil insects seems to be on the increase. Since the losses of the long residual soil insecticides such as Chlordane, we have steadily lost the next level of soil insecticides such as Furadan and Dyfonate. Currently our only alternatives are fallowing, fumigation, or conventional insecticides such as Lorsban and Diazinon. These will continue to prove less than adequate for certain pests.

One of the primary soil insects from years past is the whitefringed beetle larvae. Dyfonate was about 70 to 80 percent effective at the highest rate under ideal situations. Lorsban and diazinon have never been very effective on WFB. The remainder of alternatives has very limited efficacy. Whitefringed beetle infestations are very unpredictable even though they can be sampled for during land preparation. A problem this year does not preclude a problem the following year. WFB have one and a partial generation per year. WFB adults lay eggs in the summer and the larvae develop in the fall and

over the winter and spring. This means they are present in their most damaging stage during spring plantings. When damage occurs replanting does not often offset the problem. I have seen fields transplanted as many as three times and still not have an economic stand for production. WFB can be found in most any new ground situation such as cleared fence rows, behind turf or pasture.

As we move through time, other soil insects will become more prevalent problems. Wireworms, white grubs, southern corn rootworms and lesser cornstalk borers are the main ones coming to mind. It is not a doomsday message relative to these pests, but an observation that growers are in a precarious new age when we will no longer have the soil fumigation potential that we have today. I am not looking forward to scouting for adult beetles and expending monies for prevention of egg laying, especially since there is no way to predict that you will have a problem, and the investment is being made on the current crop for a future crop. Needless to say, we have to look forward for solutions, not bury ourselves with the inevitable.

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## Select 2 EC Herbicide Receives Additional Vegetable Labels

Stanley Culpepper  
Extension Weed Scientist - UGA

Through efforts of IR-4 and Valent U.S.A. Corporation, Select has obtained additional uses in several commonly grown vegetables in South Georgia (Table 1). Select is a postemergence graminicide that effectively controls most emerged annual grasses such as crabgrass, Texas panicum, and broadleaf signalgrass and suppresses growth of perennial grasses such as bermudagrass. According to the new supplemental label, always use a crop oil concentrate at 1% v/v in the finished spray volume unless tank mix instructions indicate otherwise.

Table 1. Vegetable crops, use rates, and pre-harvest intervals for “new” Select 2 EC uses.

Vegetable	Maximum use rate per application	Pre-harvest interval (days)
Cantaloupe	8 fl. oz.	14
Carrots	8 fl. oz.	30
Celery	8 fl. oz.	30
Cucumber	8 fl. oz.	14
Eggplant	8 fl. oz.	20
Pepper (bell & non-bell)	8 fl. oz.	20
Pumpkin	8 fl. oz.	14
Radish	8 fl. oz.	15
Squash	8 fl. oz.	14
Sweet Potatoes, Potatoes	—*	30
Tomato	8 fl. oz.	20
Watermelon	8 fl. oz.	14

\*Rate not specified on the supplemental label.

## Spray Nozzles and Application Rates

Paul E. Sumner  
Extension Engineer - UGA

Spray nozzle section is one of the most important decisions to be made related to pesticide applications. The type of nozzle determines not only the amount of spray applied, but also the uniformity of the applied spray, the coverage obtained on the sprayed surfaces, and the amount of drift that can occur. Each nozzle type has specific characteristics and capabilities and is designed for use under certain application conditions. The types which are commonly used for ground application of agricultural chemicals for vegetables are the fan and cone nozzles.

## Herbicides

The type of nozzle used for applying herbicides is one that develops a large droplet and has no drift. The nozzles used for broadcast applications include the extended range flat fan, drift reduction flat fan, turbo flat fan, flooding fan, turbo flooding fan, turbo drop flat fan, and wide angle cone nozzles. Operating pressures should be 20 to 30 psi for all except drift reduction and turbo drop flat fans, flooding and wide angle cones. Spray pressure more than 40 psi will create significant drift with flat fans nozzles. Drift reduction and turbo drop nozzles should be operates at 40 psi. Flooding fan and wide angle cone nozzles should be operated at 15 to 18 psi. These nozzles will achieve uniform application of the chemical if they are uniformly spaced along the boom. Flat fan nozzles should be overlap 50 to 60 percent.

## Insecticides and Fungicides

Hollow cone nozzles are used primarily for plant foliage penetration for effective insect and disease control, and when drift is not a major concern. At pressures of 60 to 200 psi, these nozzles produce small droplets that penetrate plant canopies and cover the underside of the leaves more effectively than any other nozzle type. The hollow cone nozzles produce a cone shaped pattern with the spray concentrated in a ring around the outer edge of the pattern. Even fan and hollow cone nozzles can be used for banding insecticide or fungicides over the row.

## Nozzle Material

Various types of nozzle bodies and caps, including color coded versions, and multiple nozzle bodies are available. Nozzle tips are interchangeable and are available in a wide variety of materials, including hardened stainless steel, stainless steel, brass, ceramic, and various types of plastic. Hardened stainless steel and ceramic are the most wear-resistant materials. Stainless steel tips, with corrosive or abrasive materials, have excellent wear resistance. Plastic polymer tips are resistant to corrosion and abrasion and are proving to be very economical for applying pesticides. Brass tips have been common but wear rapidly when used to apply abrasive materials such as wettable powders. Brass tips are economical for limited use, but other types should be considered for more extensive use.

## Water Rates (GPA)

The grower who plans to use spray materials at the low water rates should follow all recommendations carefully. Use product label recommendations on water rates to achieve optimal performance. Plant size and condition influence the water rate applied per acre. When plants are small use 25 to 30 gpa. As the plant foliage becomes larger start increasing the amount up to 100 to 200 gpa. A good indication is to examine the foliage behind the sprayer before the spray dries to determine if you have sufficient coverage.

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## Tifton Plant Disease Clinic

Jason Brock  
Plant Disease Diagnostician -UGA

During the past month, the Tifton Plant Disease Clinic continued to receive many samples from greenhouses. Winter crops and spring transplants also suffered from field diseases. Transplanting should come to an end during the coming month. With the plants being in the field, a wider range of diseases might be seen.

Questions have been asked about the meaning of “No Disease”, “Disease Symptoms”, and other such diagnoses. I will give a simple explanation as to how we use these terms. “Disease Symptom” is used when we suspect that a disease is the problem, but we cannot confirm. “No Disease” is used when we are confident the problem is not a disease, but we do not have enough information to go beyond that claim. When we do have more information, we will use “environmental”, “chemical phytotoxicity”, “physical injury” or more specific diagnoses.

The next page is a summary of the commercial vegetable samples received during the past month.

Cabbage:	Black Rot (2) Disease Symptoms Nutritional
Cantaloupe:	Acidovorax facilis Pythium Root and Stem Rot (4)

Pseudomonas sp. (2) Disease Symptoms No Disease Too Deteriorated to Diagnose (TDTD)
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Carrot:	Unknown
Eggplant:	Wind Damage
Onion:	Botrytis Soil-Line Rot (2) Purple Blotch Stemphylium Leaf Blight No Disease TDTD
Pepper:	Bacterial Leaf Spot Pythium Root and Stem Rot (2) Unknown
Snap Bean:	No disease
Squash:	Root-Knot Nematode No Disease
Tomato:	No Disease (2)
Watermelon:	Cladosporium sp. Gummy Stem Blight Pseudomonas viridiflava Pseudomonas syringae pv. syringae Pythium Root and Stem Rot (9) Stem splitting (stress-related) Disease Symptoms Chemical Phytotoxicity (2) Chemical or salt injury No disease (3)

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Editor . . . . . David B. Langston, Jr.  
Production Assistant & Webmaster . . . . Paul Sumner

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