Georgia Extension Vegetable News

The University of Georgia

Cooperative Extension Service

College of Agriculture and Environmental Sciences / P.O. Box 1209, Tifton, GA 31793

The Cooperative Extension Service, and the University of Georgia College of Agricultural and Environmental Sciences does not guarantee or warrant any product mentioned; neither does the use of a trade or brand imply approval of any product to the exclusion of others which may also be suitable. Trade names are for information only. The University of Georgia, the Cooperative Extension Service, and the University of Georgia College of Agricultural and Environmental Sciences offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, sex or disability and are equal opportunity/affirmative action organizations committed to a diverse work force.

Volume 2, No.1 Jan-Feb 2002

Contents...

Quadris Resistance in Gummy Stem Blight Confirmed

David Langston
Extension Vegetable Pathologist - UGA

Gummy stem blight, caused by the fungus *Didymella bryoniae* is the most widespread and destructive disease of watermelon in Georgia. Although watermelon suffers the greatest losses from gummy stem blight, severe epidemics are observed in cucumber and cantaloupe each year. Management options for this disease are rotation, deep turning diseased tissue, avoiding irrigating that prolongs leaf wetness, and preventive fungicide applications. Of these management options, preventive fungicide applications is the most effective. Fungicides labeled for control of gummy stem blight are primarily ethylenebisdithiocarbamates (EBDCs such as Dithane, Maneb, Manzate, Penncozeb, ect), chlorothalonil (Bravo, Echo, Equus), benomyl (Benlate), thiophanate methyl (Topsin M), and just recently, azoxystrobin (Quadris), a fungicide in the new strobilurin class of chemistry. Benomyl or thiophanate methyl tank-mixed with EBDC's and alternated with chlorothalonil products had proven to offer good control of gummy stem blight until resistance to the benzimidazoles (benomyl and thiophanate methyl) was observed in the early 1990's. Chlorothalonil products have shown good efficacy on gummy stem blight but are not used because they have been implicated in causing phytotoxicity to mature watermelon rinds. Azoxystrobin was shown to have excellent efficacy on gummy stem blight by several researchers in the early 1990's and was granted Section 18 emergency exemption status in Georgia in 1997 and 1998 specifically for gummy stem blight control. A full Section 3 national label was granted for azoxystrobin use on the cucurbit crop grouping in March of 1999 which led to the widespread and routine use of the fungicide to control a broad spectrum of foliar cucurbit diseases. However, reduced efficacy of azoxystrobin on gummy stem blight has been noted in several grower fields and in watermelon fungicide trials conducted in1999 and 2000 in Cordele, GA. In 2001, six applications of azoxystrobin (Quadris 2.08SC at 12.3 fl/oz) resulted in a 14% increase in gummy stem blight severity compared to plots not receiving fungicide treatment. Reduced efficacy may be a result of possible fungicide resistance, which has been observed in strobilurins in Europe.

Isolates of the pathogen collected in 2000 from watermelon fields in Delaware, Maryland, and Georgia, where disease control was unsatisfactory, were recently confirmed by Syngenta to be resistant to azoxystrobin. In 2001, an extensive survey was conducted to determine the frequency of azoxystrobin-resistant isolates in commercial watermelon fields in Georgia.

Isolates of the fungus were obtained from samples of infected watermelon from 25 commercial watermelon fields and research sites in Georgia.

Sensitivity of each isolate to azoxystrobin was determined using a spore germination assay on water agar (WA) medium amended with azoxystrobin and salicylhydroxamic acid (SHAM) to inhibit an alternative respiratory pathway in the fungus that can interfere with the activity of the fungicide. Conidia of each isolate were transferred to fungicide-amended or unamended agar plates. After 48 h of incubation at 23-25°C, the percentage of germinated spores was recorded. Fungicide sensitivity was expressed as the ED_{50} value (the fungicide concentration that inhibits spore germination by 50% relative to the control). As reported by Syngenta, an isolate was considered resistant to azoxystrobin if the ED_{50} value was >10 $\mu g\ ml^{-1}$.
Preliminary results from 8 of the 25 locations provide evidence of widespread resistance in the gummy stem blight pathogen to azoxystrobin in Georgia. Of the 65 isolates tested to date, 54 isolates (83%) were found to be resistant to azoxystrobin based on the spore germination assay. Isolates from the remaining 17 locations are currently being tested. Extensive sampling for the upcoming 2002 season is planned.

Where did this problem originate and what will growers do now? It is very difficult to determine at this time exactly where the azoxystrobin-resistant isolates originated. However, overuse of the product both in the greenhouse and in the field are the primary suspects. When a fungicide of this type is used repeatedly, without rotating to fungicides with a different mode of action, the chance of selecting for a fungicide-resistant population of the target fungus is very great. Rotating to different fungicide chemistries will hopefully control the resistant populations before they can reproduce and spread. Growers should now look towards the more traditional fungicides for protecting their watermelon crops. The mancozeb and chlorothalonil products both suppress gummy stem blight to some degree. Mancozeb products alone are usually marginally effective at best and chlorothalonil products have been implicated with a rind burn when applied within two weeks of harvest. However, chlorothalonil remains our most effective labeled material for Where did this problem originate and what will growers do now? It is very difficult to determine at this time exactly where the azoxystrobin-resistant isolates originated. However, overuse of the product both in the greenhouse and in the field are the primary suspects. When a fungicide of this type is used repeatedly, without rotating to fungicides with a different mode of action, the chance of selecting for a fungicide-resistant population of the target fungus is very great. Rotating to different fungicide chemistries will hopefully control the resistant populations before they can reproduce and spread. Growers should now look towards the more traditional fungicides for protecting their watermelon crops. The mancozeb and chlorothalonil products both suppress gummy stem blight to some degree. Mancozeb products alone are usually marginally effective at best and chlorothalonil products have been implicated with a rind burn when applied within two weeks of harvest. However, chlorothalonil remains our most effective labeled material for gummy stem blight suppression.

Curbit Out - Strategy In

A. Stanley Culpepper - Extension Weed Science

The registrant of Curbit herbicide has decided to eliminate production and sale of Curbit for all crops including cucumber, melons, squash, pumpkin, and watermelon.

Strategy, a new herbicide by UAP, will attempt to replace the loss of Curbit. Strategy is a mixture of ethalfluralin (active ingredient of Curbit) and clomazone (active ingredient of Command) and will be labeled for use in cucumber, melons including cantaloupe, squash, processing pumpkin, and watermelon for the 2002 season.

Application rates of Strategy will differ from historical use rates of Curbit. Table 1 allows growers to select the rate of Strategy needed to provide the rate of Curbit used in past seasons. <u>Strategy rates for most Georgia soils should be between 2 and 3 pints per broadcast acre.</u>

It is critical that users of Strategy read and follow labeled directions. Several of the issues addressed on the Strategy label are noted in Table 2; however, this table does not provide all of the recommendations and restrictions found on the label.

Tomato Tolerance To Treflan and Tillam

A. Stanley Culpepper
Extension Weed Science

With the phase out of methyl bromide, many vegetable growers are forced to search for alternative methods of weed control. In tomato, several herbicide options including trifluralin (Treflan, others) and pebulate (Tillam) are available to assist in weed control. Unfortunately, growers have been concerned with tomato response to Tillam and Treflan when applied under plastic mulch. Thus, studies were conducted to evaluate tomato tolerance to these herbicides when applied broadcast and incorporated with a tilrovator followed immediately by a super-bedder plastic layer.

Treflan stunted tomato 13, 25, and 50% when applied at 0.5, 1.0 and 1.5 pt/A, respectively, at early-season (Table 3). This plant stunting was still noticeable at late-season when plant measurement heights were taken from each plot. Treflan at 0.5 pt/A did not affect yield compared to the non-treated control. However, delayed maturity and reduced tomato fruit weights were noted with Treflan at 1.0 or 1.5 pt/A. Treflan at 1 and 1.5 pt/A reduced tomato yields by 39 to 53% at the first harvest and 23 to 63% for the total harvest.

Tillam stunted tomato 8, 16, and 30% at 0.75, 2.5, and 5 pt/A, respectively, at early-season (Table 4). By late-season, only Tillam at 5 pt/A stunted tomato greater than 10%. Tillam at 0.75 and 2.5 pt/A did not affect yield; however, 5 pt/A reduced tomato weight yield 20% for the first harvest and 20% for the total harvest.

When Treflan and Tillam were applied together, herbicide injury was nearly additive (data not shown). For example, Treflan 1.0 pt/A stunted tomato growth 25% at early season while Tillam 0.75 pt/A stunted growth 8%, thus both herbicides applied together stunted tomato growth approximately 33%.

Sandea Label For Cucumber and Cantaloupe Expected Anytime

Stanley Culpepper - Extension Weed Science

A Section 24(c) label request for the use of Sandea herbicide in cucumber and cantaloupe for Georgia producers has been submitted to the Georgia Department of Agriculture. Hopefully, with the cooperative efforts of Gowan Company, the University of Georgia, and the Georgia Department of Agriculture, Sandea labels for cucumber and cantaloupe will be granted within the next two weeks. Once I receive these labels, they will be forwarded by e-mail to Extension Agents with vegetable responsibilities.

For crops labeled, I would strongly encourage the use of Sandea by Gowan Company and not other products with the same active ingredient. If growers choose to use other products with the same active ingredient as Sandea, these labels and all future labels will likely be lost quickly.

At this time, I am unaware of how much a Sandea application will cost.

Tifton Plant Disease Clinic

Jason Brock
Plant Disease Diagnostician -UGA

Looking back over the past couple of years, I see that most diseases diagnosed in Tifton have been soil-borne. When collecting or examining a sample, be careful to include the roots and stem. Do not pull a plant out of the ground or container. Instead, dig around the plant and lift. Wash all soil from the roots and look for necrotic tissue that might be a symptom of a disease. Please refer to page 12 of the Pest Control Handbook for information on collecting and shipping samples.

The following is a summary of the commercial vegetable samples diagnosed during January and February.

Carrot:	Environmental
Collard:	Downy Mildew
Cucumber:	Potyvirus No disease
Onion:	Botrytis Leaf Blight Stemphylium Leaf Blight Chemical Phytotoxicity
Watermelon:	Gummy Stem Blight Pythium Damping-Off Chemical Phytotoxicity

Georgia Extension Vegetable News

Volume 2, No.1. January - February 2002

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

The Georgia Extension Vegetable News is published bimonthly for Jan-Feb, Sept-Oct, and Nov-Dec and monthly March-Aug. This newsletter is also available on the World Wide Web at www.cpes.peachnet.edu/veg.

Table 1. Strategy rates and the amount of Curbit and Command provided by specific Strategy rates.

Soil Texture	Strategy Rate (broadcast rate/A)	Amount of Curbit from respective rate of Strategy	Amount of Command from respective rate of Strategy
Coarse	2 to 3 pints	1 to 1.5 pints/A	0.33 to 0.5 pint/A
Medium	3 to 4 pints	1.5 to 2 pints/A	0.5 to 0.67 pint/A
Fine	4 to 6 pints	2 to 3 pints/A	0.67 to 1 pint/A

Table 2. Several recommendations and restrictions from the Strategy label. Refer to the actual label for more restrictions and recommendations.

1. Apply prior to weed emergence.
2. Apply to seeded crops prior to emergence, or apply as a banded spray between rows after crop emergence or transplanting.
3. **DO NOT** apply overtop of crop.
4. **DO NOT** apply overtop of any mulch.
5. **DO NOT** incorporate prior to planting.
6. **DO NOT** make broadcast applications to transplants.
7. Be aware of the potential injury from ethalfluralin (active ingredient of Curbit) primarily on seeded crops when a heavy rain occurs within a couple of days after application.
8. Be aware of buffer restrictions. Clomazone (active ingredient of Command) is a highly volatile product and buffer restrictions are required.

Table 3. Tomato response to Treflan applied broadcast incorporated followed by the super-bedder plastic layer.

Treflan rate (pt/A)	% stunting (early-season visual estimates)	% stunting as determined by taking plant heights (late-season)	% yield loss compared to non-treated control (large and X-large)*	
			1st harvest	total harvest
0	0	0	--	--
0.5	13	9	0	0
1.0	25	17	39	23
1.5	50	24	53	63

*Yield loss is a measure of weight per equivalent area harvested.

Table 4. Tomato response to Tillam applied broadcast incorporated followed by the super-bedder plastic layer.

Tillam rate (pt/A)	% stunting (early-season visual estimates)	% stunting as determined by taking plant heights (late-season)	% yield loss compared to non-treated control (large and X-large)*	
			1st harvest	total harvest
0	0	0	–	--
0.75	8	1	0	1
2.5	16	7	0	0
5.0	30	15	20	20

*Yield loss is a measure of weight per equivalent area harvested.

County Extension Agent____________________