THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION
Colleges of Agricultural and Environmental Sciences & Family and Consumer Sciences

JUNE 2007

HOMEOWNER PLANT DISEASE CLINIC REPORT

Holly Thornton, Homeowner IPM Specialist

Every time one of those dark, lingering clouds comes our way in Athens, I begin to feel overwhelmed with joy, and then…it either rains for ten minutes or misses us completely. It's likely most Georgians are experiencing the same feelings of angst when it comes to the drought, especially the farmers and individuals involved in agriculture, along with those in the Green Industry. Unfortunately, we have little control over the weather. Prayer and an occasional rain dance will hopefully bring us the relief we need to survive the summer and fall.

You will find the usual table of Homeowner samples submitted below. I would like to thank all who are properly submitting Homeowner samples. I am aware of the continued resentment towards the $10 processing charge but hope this subsides with time. Again, I am more than willing to assist any agent with individual samples. Email is the best way to reach me.

Also, I was informed by several agents that the Northeast & Northwest Districts were never told that Jason Brock (Diagnostician in Tifton) and I had purchased some diagnostic supplies (slides, coverslips, needles, forceps/tweezers, scalpels, blades, and/or stain) for agents with some year-end money. If you need some of the above supplies, please send me an email with your requests (I will try to fill them accordingly). I know requests from agents in the Southeast & Southwest Districts were sent in and filled earlier this month.

The Disease of the Month for June is…TSWV, a.k.a. Tomato Spotted Wilt Virus. Enjoy!

County	Plant	Common Name of Disease (Pathogen)	Type of Sample – DDDI or Physical
Baker	Potato	Possible Root Knot Nematode damage	DDDI
Bartow	Cryptomeria	Drought-related damage	Physical
Bartow	Leyland Cypress	Drought-related damage	Physical
Ben Hill	Tomato	Tomato spotted wilt virus (TSWV)	DDDI

County	Plant	Common Name of Disease (Pathogen)	Type of Sample – DDDI or Physical
Bibb	St. Augustine	Take-all root rot (*Gaeumannomyces graminis*)	Both
Bibb	Tomato cv. Rutger	Early leaf spot (*Alternaria solani*)	DDDI
Bibb	St. Augustine	Take-all root rot (*G. graminis*)	Both
Bibb	Tomato cv. Better Boy	TSWV	Physical
Candler	Petunia (Mexican)	Root rot – *Rhizoctonia* sp. and *Pythium* sp.	Physical
Carroll	St. Augustine	Take-all root rot (*G. graminis*)	Physical
Carroll	Roma Beans	Scorch or burn (watering problems)	DDDI
Carroll	Bermuda	Rust (*Puccinia* sp.) & Leaf spot (*Helminthosporium*)	Physical
Chatham	St. Augustine	Compounded stresses (thatch & dry soil)	Physical
Chatham	Azalea	Powdery mildew	Physical
Cherokee	Tomato	Possible TSWV	DDDI
Cherokee	Miscanthus	Severe Spider mite damage	Both
Clarke	Tomato	TSWV	Physical
Clarke	Japanese Maple	Burn/scorch	Physical
Clarke	Zoysia	Cultural (thatch, dry, compacted soils)	Physical
Coweta	Zoysia (Emerald)	Compounded stresses (Take-all, compacted soils, dry)	Physical
Dougherty	Crape Myrtle	Unable to determine – no roots submitted	Physical
Douglas	Yellow Twig Dogwood	Compounded stresses (scale, possible root rot, cankers)	Physical
Fannin	Cryptomeria	Cultural (drought & cold stress)	DDDI
Fayette	American Boxwood	Possible environmental and/or cultural damage with a trace of *Pythium*	Physical
Fayette	Camellia	Fungal leaf spot	DDDI
Fayette	Hybrid Bermuda	No disease – cultural (clotted, compacted soils)	Physical
Fayette	Tomato	Unable to determine – wilt	DDDI
Fayette	Bermuda	Compounded stresses - some disease & cultural (no irrigation, heavy clotted soil, thatch)	Physical

County	Plant	Common Name of Disease (Pathogen)	Type of Sample – DDDI or Physical
Forsyth	Leyland Cypress	Herbicide burn	DDDI
Gwinnett	Zoysia (Meyer)	Large Patch (*Rhizoctonia solani*); Rust (*Puccinia*) – foliage; Cultural (Thatch)	Physical
Gwinnett	Tomato cv. Better Boy	Possible TSWV	DDDI
Gwinnett	Tomato cv. German Queen	Possible TSWV	DDDI
Harris	Multiple vegetables	Herbicide injury	DDDI
Harris	Day Lily	No disease – possible insect	Physical
Jackson	Centipede	Cultural (heavy thatch, clotted soils) & Take all	Physical
Jackson	Clematis	Possible Scorch or lower stem problem	DDDI
Jackson	Apple	Fire Blight	DDDI
Jackson	Tomato	Possible nutritional problems	DDDI
Jackson	Lantana	Possible herbicide damage or nutritional problems	DDDI
Jenkins	St. Augustine	Slime mold	DDDI
Long	Tomato	Blossom end rot	DDDI
Mitchell	Hollyhock	Rust (*Puccinia* sp.)	DDDI
Monroe	Leyland Cypress	Severe Scale	Both
Monroe	Centipede	No disease	Physical
Monroe	Tomato	2 plants: 1 – TSWV; 2 – Herbicide injury	Physical
Monroe	Squash	No disease – burn	DDDI
Morgan	Zoysia (Emerald)	Large Patch (*Rhizoctonia* sp.) and Cultural (Heavy clotted soils)	Physical
Morgan	Cherry Tomato	Possible Foliar Fertilizer burn	Both
Morgan	Bell Pepper	Sunscald	DDDI
Morgan	Tomato	No disease – possible herbicide drift damage & Spider mites	Both
Muscogee	Zoysia	No disease	Physical
Pickens	Pole bean	Possible Bacterial Leaf Spot/blight	DDDI
Schley	Muscadine	Possible chemical or insect injury	DDDI
Schley	Knockout Rose	Spider mite damage	DDDI

County	Plant	Common Name of Disease (Pathogen)	Type of Sample – DDDI or Physical
Stephens	Rose	Unable to determine	DDDI
Taylor	Tomato cv. Early Girl, Better Boy, etc.	Possible TSWV	DDDI
Toombs	Squash	Possible Squash Mosaic Virus	DDDI
Toombs	Dogwood	Possible cultural (under-watered) or herbicide damage	DDDI
NA	Bromeliad	Unable to determine	Physical
Total Samples (mid-May to mid-June) = 59			

TSWV

Thrips

www.tswv.org

TSWV, also known as Tomato Spotted Wilt Virus, is an economically important virus that infects many host plants worldwide (>900 species of plants – ornamentals, field crops, and vegetables). Today, I will discuss TSWV as a plant pathogen on tomatoes, given that almost every tomato plant I have seen in the clinic this summer has been infected with this virus.

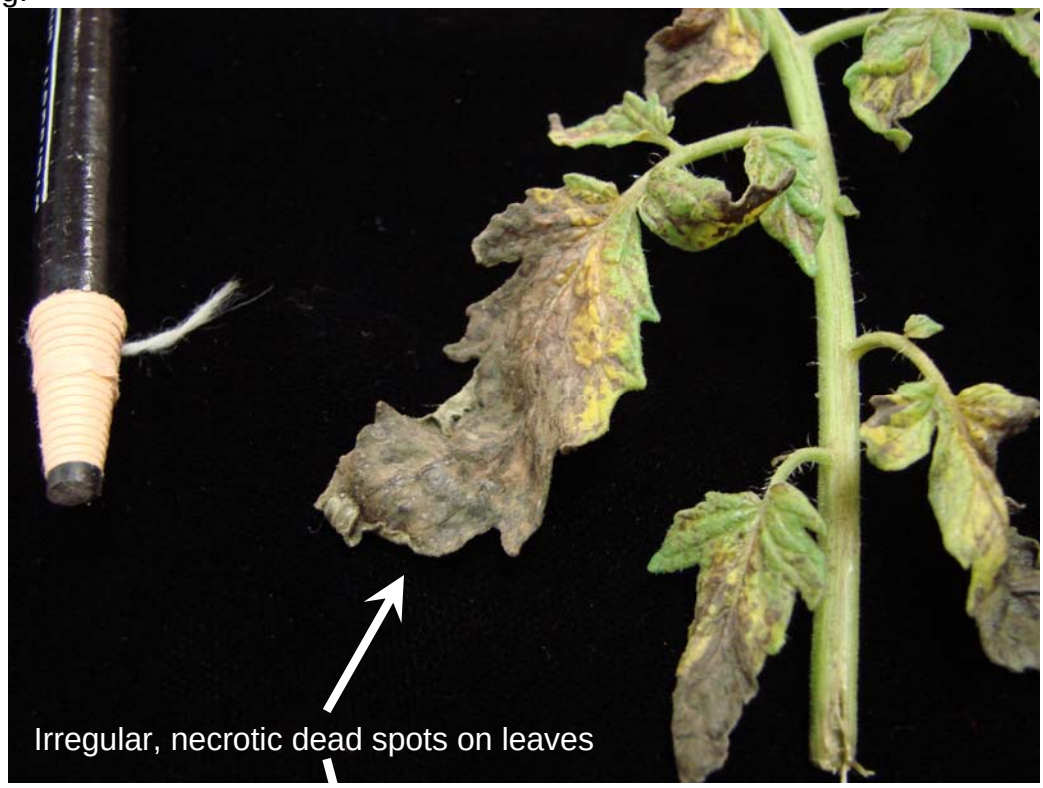
VECTOR & TRANSMISSION:

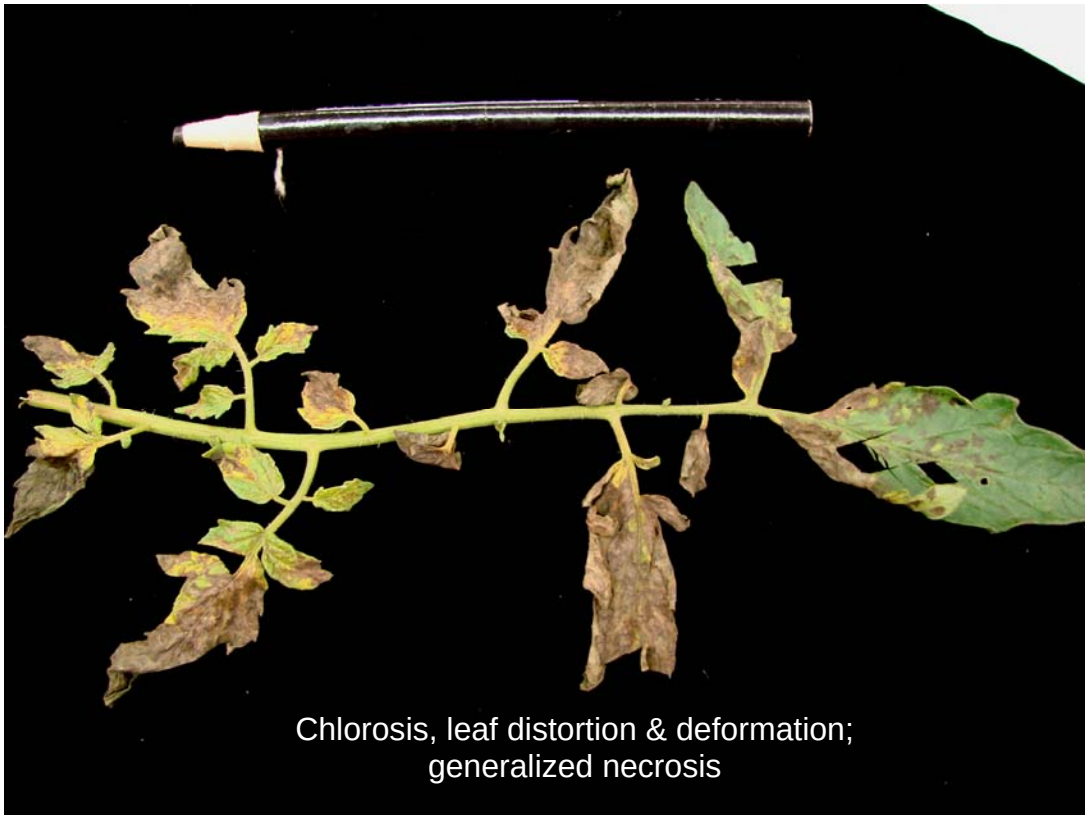
A unique fact about TSWV is that, it is the only virus transmitted by certain thrips species (~9 species) in a persistent manner, meaning once the thrips have acquired the virus, it is capable of transmitting the virus the rest of its life (30 to 45 days). Juveniles (larval stages) acquire the virus and cannot transmit it until the second instar and adult stages. Thrips must feed on the infected plant for 20 to 30 minutes to acquire the virus. Few thrips can easily spread the disease among many plants. Thrips also vector INSV (Impatiens Necrotic Spot Virus). Thrips also will cause damage while feeding on the host plants producing deformed plant growth (leaves and flowers), silvery appearance, and flecking on leaves. See image below – on tobacco.

The disease can also be spread vegetatively and overwinters in perennial or biennial hosts (such as weeds). It is not spread by pollen or seed (the virus remains on the seed coat and does not enter the embryo).

SYMPTOMS:

Symptoms vary depending on the cultivar but generally include one or more of the following:





Chlorosis, leaf distortion & deformation;
generalized necrosis

Black or purple streaks on stems;
stem browning

The most obvious symptom – ring spots on fruit – this does not always occur!

Other symptoms not shown:

- Discolored veins
- Leaf drop
- Stripes on petals
- Overall stunting of plant
- Deformed fruit
- Reduced fruit quality & yield

MANAGEMENT:

- No chemical means to control the virus. The infection is systemic and plants must be removed and discarded.
- Weed control
- Insect control – limited success
    - Regular monitoring for the thrip vectors
    - Treatment with insecticides – this task is difficult and oftentimes ineffective because thrips readily develop resistance to insecticides and they fly or get blown in from nearby untreated or infected areas. They also manage to hide in various plant parts.
    - Registered products – pyrethroids, carbamates, chlorinated hydrocarbons, organophosphates, and soaps.
- Rotate crops
- Purchase virus-free material (use a reputable source)

IDENTIFYING TSWV IN THE LAB:

Diagnostically, virus diseases are very different than other plant pathogens, such as fungi, bacteria, and nematodes. We can not use microscopy to diagnose virus diseases because, as you may already know, viruses can only be seen with high-powered

electron microscopes (most diagnostic labs are not equipped with these because of their cost). In addition, culturing onto artificial media is not a viable alternative because viruses are obligate parasites and cannot reproduce or survive without a living host. Therefore, we rely on an antibody test called an Immunostrip, developed and sold by Agdia, to determine if a plant is infected with a virus or not.

Virus diseases can also mimic other plant diseases and abnormalities (wilts or burns) so it is important to accurately identify the cause of the disease so we can make appropriate recommendations.

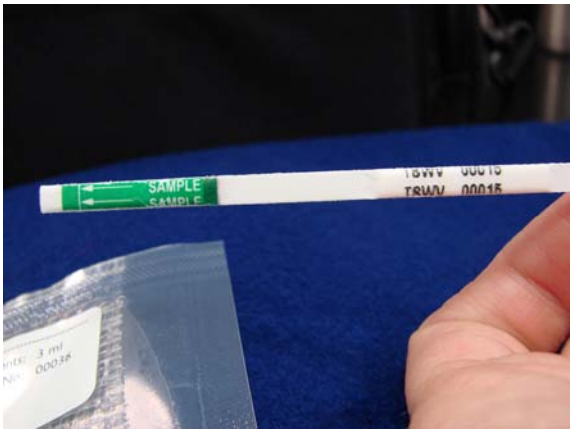
These tests are accurate, user-friendly, and quick. It takes less than 15 minutes to see results. The tests are also reasonably priced (25 strips & 25 bags for ~$100) for diagnostic use.

Step 1: Cut open the bag

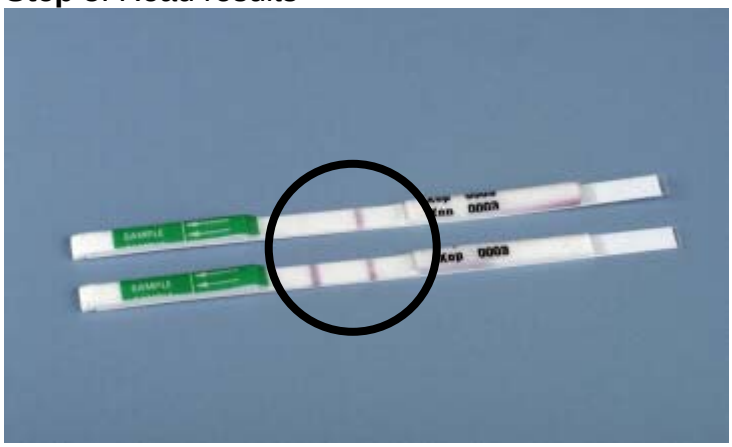
Step 2: Place sample in the bag (between the mesh pieces)

Step 3: Grind the plant sample

Step 4: Insert strip into bag



Step 5: Read results



Formation of 2 distinct lines indicates a positive reaction (one is a control). Learn more on the Agdia website: http://www.agdia.com/.

REFERENCES:

- Agrios. 5th edition. Plant Pathology. 2005
- Agdia website: www.agdia.com
- Identifying Diseases of Vegetables. Penn State.
- Images with UGA label: www.invasive.org.