



# Diseases and Nematodes: Losses and Management

**R.C. Kemerait, T.B. Brenneman and A.K. Culbreath**

University of Georgia  
Department Plant Pathology  
Tifton, GA

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# Diseases and Nematodes

## The take-away points



- Growing the quality of peanuts, for which Georgia's farmers, are known requires considerable effort.
- Peanut production in Georgia is threatened by a number of important diseases and plant-parasitic nematodes. (For today, five + one to be considered)
  - **I want you to recognize them in fields we visit.**
- As you join us on this tour, I want you to make you aware of five significant issues facing our growers.

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HOST



PATHOGEN



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HQ Y IWR Q P HQ W





# Peanuts and Diseases – Perfect Environment and Difficult Targets!



- Leaf spot
- Limb rot
- White mold

# **Diseases and Nematodes**

## **How they affect peanut plants**



- **Damage to leaves**
  - Leaf spots, leaf loss, reduced photosynthesis
- **Damage to stems**
  - Weakened plant, loss of “pegs” connecting pods
- **Damage to roots**
  - poor water/nutrient uptake
- **Wilts**
  - damage to water uptake and plant integrity
- **Damage to pods**

# **Diseases and Nematodes**

## **How they affect the farmers**



- **Diseases reduce yields.**
- **Diseases reduce quality of yield.**
- **Diseases reduce the value of crop and profit to the farmers.**
- **Diseases cost time, labor, & money to control.**

# The Foundations of Disease Management

- Plant resistant varieties.
- Practice crop rotation.
- Remove of “volunteer” peanuts from field.
- Practice field sanitation.
- Judicious use of fungicides.
  - Correct rate and spray volume
  - Correct timing of application
  - Appropriate product





# AND ORGANIC PRODUCTION?

- Many who attend are interested in organic production without use of synthetic fertilizers or pesticides.
- Key tools: quality seed, crop rotation.
- Successful organic production is a possibility **IF** farmers can:
  - **Plant disease resistant varieties**
  - **Possible appropriate fungicides**
  - **Manage soil fertility**
  - **Manage insect pests**
  - **MANAGE WEEDS!!!!!!**





# Diseases and Nematodes

## What are the “5 + 1”?



- Tomato Spotted Wilt (virus spread by thrips)
- Aspergillus Crown Rot (fungal killing seedlings)
- “Early” and “Late” Leaf Spot Diseases (fungal)
- “White Mold” (soilborne fungal disease)
- Peanut Root-Knot Nematodes (in soil)
- + 1
- Aflatoxin (caused by fungus *Aspergillus flavus*)

# Screven County and Tomato Spotted Wilt





# Tomato Spotted Wilt Risk Factors

- **Variety**
- **Planting Date**
- **Plant Stand**
- **At-plant Insecticide**
- **Tillage**
- **Row Pattern**





# Aspergillus Crown Rot





# Non-treated vs Fungicide-Treated Seed

(92% Germination, planted May 11)







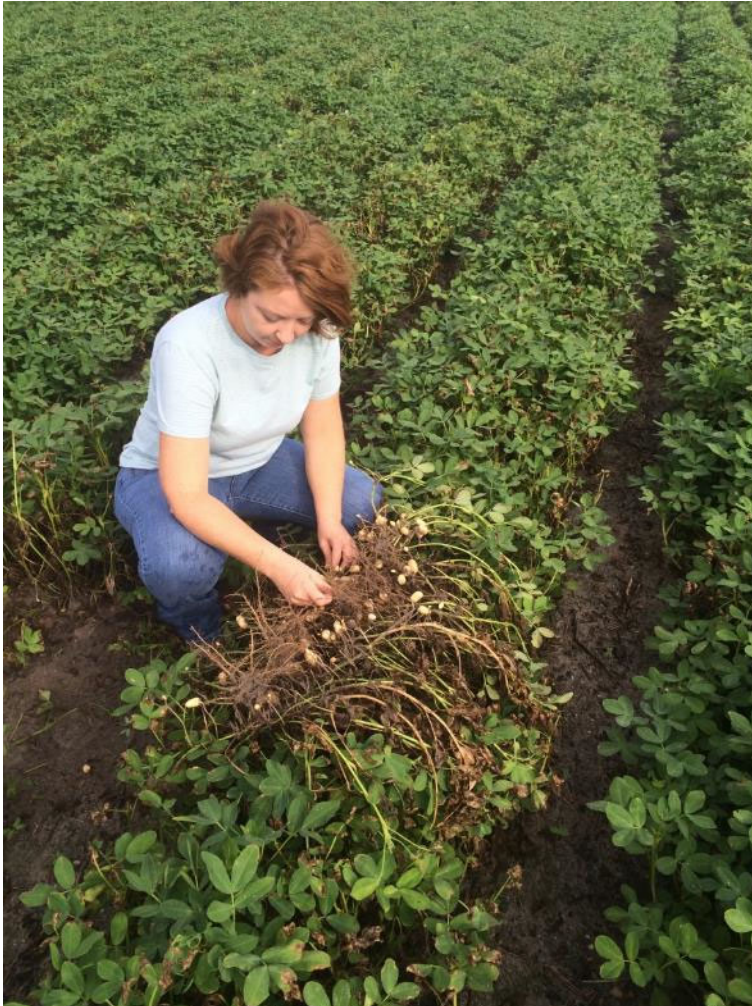


# Peanut Leaf Spot Diseases- Situation

- Early and/or late leaf spot will affect every field every year to one degree or other.
- If not effectively managed, leaf spot diseases will:
  - Defoliate crop
  - Weaken pegs
  - Reduce yields
- Growers have the tools needed to control leaf spot.
  - Fields with leaf spot problems likely linked to one of a few reasons
  - **Delayed application, late start to program, rain too soon or too often, resistance issues with some current fungicides.**

# Managing White Mold

Management is essential and often difficult



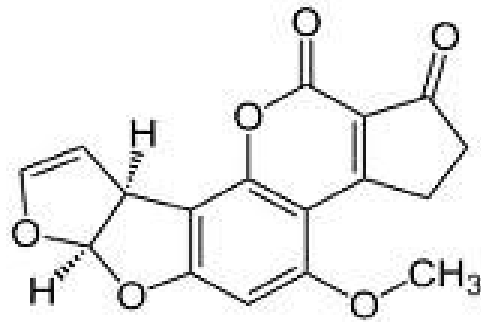


# Peanut Root Knot Nematodes



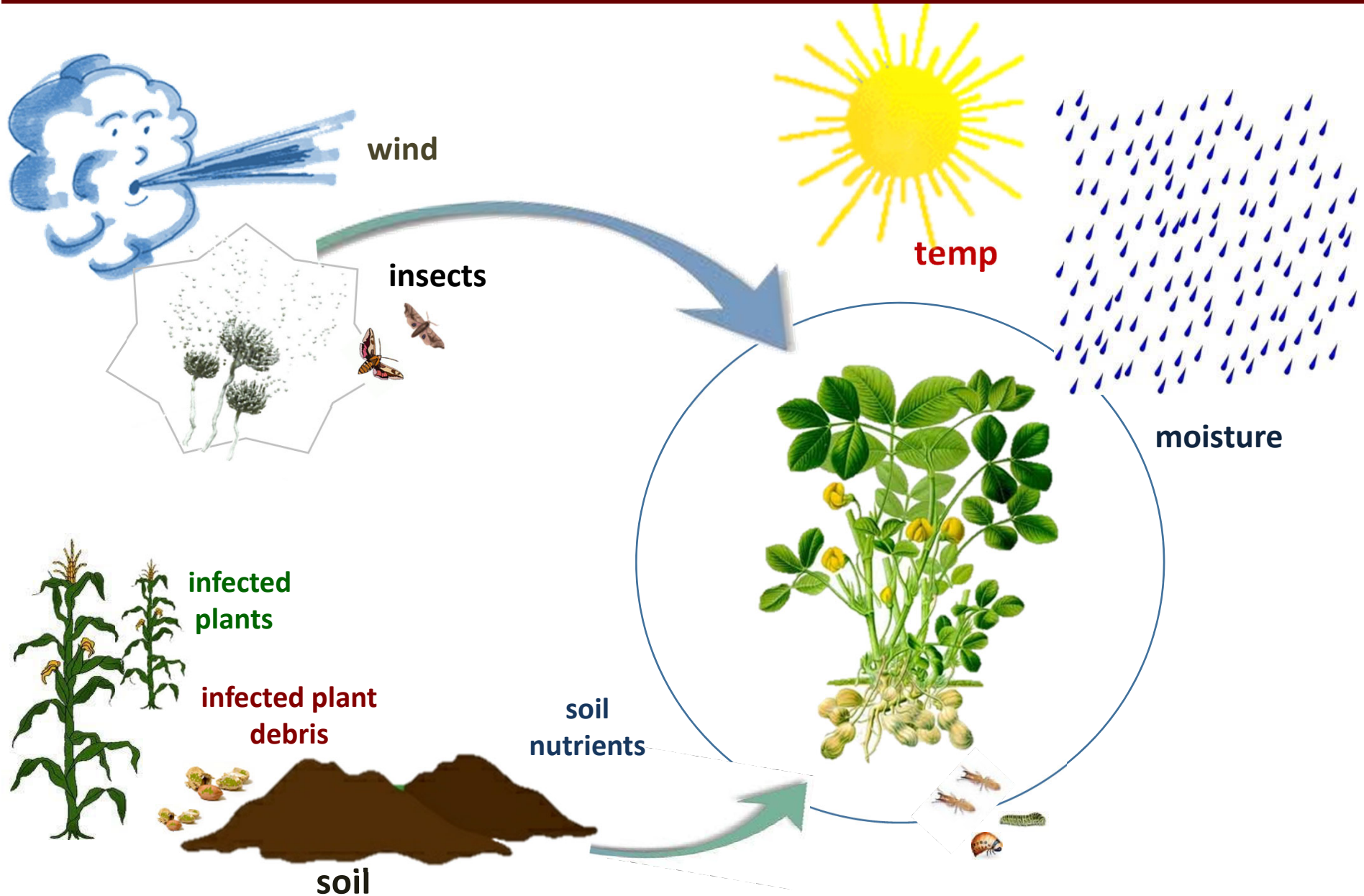


# AFLATOXIN



- Toxic compound
- Colorless, odorless and tasteless
- Produced by a mold
- Contaminates different crops:  
**corn, peanuts,** grains, **cassava,** tree nuts

# Aflatoxin Contamination:







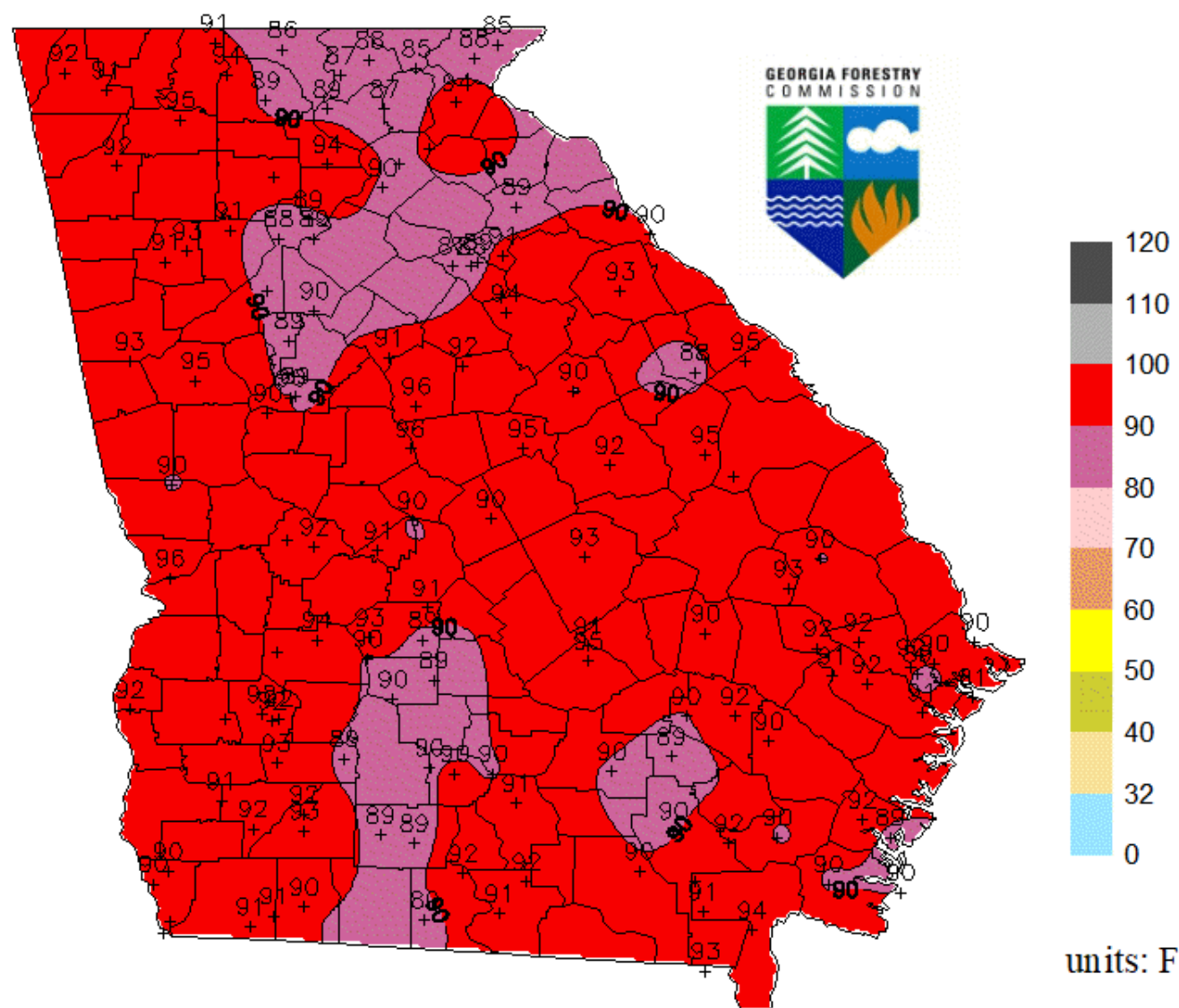
# **Diseases and Nematodes**

## **5 issues to consider here**



- **Impact of weather on diseases and our Peanut Crop**
  - High Temperatures
  - Sometimes we may want Thimet AND Velum Total
- **Fungicide resistance issues in peanut.**
  - Leaf spot, Aspergillus crown rot, white mold
- **Loss of fungicides to the EU**
  - Propiconazole, chlorothalonil?, tebuconazole?
- **Greater interest on multiple peanut varieties.**
  - Georgia-06G is a “winner”, but are we missing out?
- **Making “head or tails” of arsenal of fungicides.**
  - Growers lose if we think only one “top” program.
  - Are we sure growers are using best spray tips/technology?
  - How do we determine the most appropriate program?
  - Peanut Rx as an educational tool

# Map of Temperature at September 16, 2019 1300 EST



Georgia Automated Environmental Monitoring Network provided 75% of the stations in the map.



# The Problem with Leaf Spot..... Turner County, 2014 and Early County, 2015



# What FRACs are available?

## Group 3



## Group 7



## Group 11



## Mixed



Group M



Group 1



## 2011 Disease Risk Fungicide Schedules



Field Name \_\_\_\_\_

Planting Date \_\_\_\_\_ 30 DAYS 45 DAYS 60 DAYS 75 DAYS 90 DAYS 105 DAYS 120 DAYS

TRADITIONAL PROGRAM

LEAF SPOT LEAF SPOT LEAF SPOT/WHITE MOLD/LEAF SPOT/WHITE MOLD/LEAF SPOT/WHITE MOLD/LEAF SPOT/WHITE MOLD/LEAF SPOT/WHITE MOLD

LOW RISK\*

TiltBravo® 2.25 pt 21 days + Abound® 12-18 oz 21 days + Abound® 12-18 oz 21 days Bravo® 1.5 pt

MODERATE RISK

TiltBravo® 2.25 pt 21 days 18 oz 14 days TiltBravo® 1.5 pt 14 days 18 oz 21 days Bravo® 1.5 pt

HIGH RISK

TiltBravo® 1.5 pt 14 days TiltBravo® 1.5 pt 14 days Abound® 18 oz 14 days TiltBravo® 1.5 pt 14 days Abound® 18 oz 14 days Bravo® 1.5 pt 14 days Bravo® 1.5 pt

YOUR PROGRAM

\* If a record of a CBR pathogen is present, fungicide treatments should be applied at 30 days after planting and then at 45, 60, 75, 90, 105, and 120 days after planting. If a record of a CBR pathogen is not present, fungicide treatments should be applied at 30 days after planting and then at 45, 60, 75, 90, 105, and 120 days after planting.

Programs developed through the cooperation of



## 2009 ARTISAN® Disease Risk Spray Schedules



Field Name \_\_\_\_\_

Planting Date \_\_\_\_\_

| LEAF SPOT      | LEAF SPOT/WHITE MOLD/LEAF SPOT       | LEAF SPOT                            |
|----------------|--------------------------------------|--------------------------------------|
| 40 DAP         | 45                                   | 60                                   |
| 1st Spray      | 2nd Spray                            | 3rd Spray                            |
| Headline® 9 oz | Artisan 26 oz + Chlorothalonil 16 oz | Artisan 26 oz + Chlorothalonil 16 oz |
| 20 days        | 21 days                              | 21 days                              |

| LEAF SPOT      | LEAF SPOT/WHITE MOLD/LEAF SPOT            | LEAF SPOT                                 |
|----------------|---|---|
| 40 DAP         | 45  | 60  |
| 1st Spray      | 2nd Spray                                 | 3rd Spray                                 |
| Headline® 9 oz | Artisan 17-21** oz + Chlorothalonil 16 oz | Artisan 17-21** oz + Chlorothalonil 16 oz |
| 20 days        | 21 days                                   | 21 days                                   |

| LEAF SPOT      | LEAF SPOT/WHITE MOLD/LEAF SPOT       | LEAF SPOT                            |
|----------------|--------------------------------------|--------------------------------------|
| 40 DAP         | 45                                   | 60                                   |
| 1st Spray      | 2nd Spray                            | 3rd Spray                            |
| Headline® 9 oz | Artisan 16 oz + Chlorothalonil 16 oz | Artisan 16 oz + Chlorothalonil 16 oz |
| 20 days        | 14 days                              | 14 days                              |

\*Days After Planting  
\*\*Tops can be applied a maximum of twice per season in a spray program and must not be applied consecutively.  
\*\*\*Use higher rate of Artisan if white mold risk increases to High Risk category.

See reverse side to assess the Peanut Disease Risk Index developed by:



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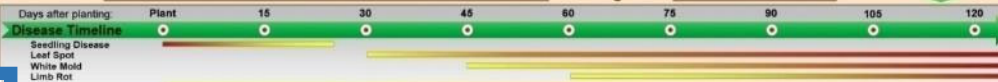
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## 2011 Provost Disease Risk Spray Schedules



Field Name: \_\_\_\_\_

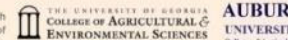
Planting Date: \_\_\_\_\_



| Low Risk              | Moderate Risk         | High Risk             | Risk of CBR           | Your Program          |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| TRILEX STAR           | TRILEX STAR           | TRILEX STAR           | TRILEX STAR +         | TRILEX STAR           |
| Chlorothalonil 1.5 pt | Chlorothalonil 1.5 pt | Chlorothalonil 1.5 pt | Chlorothalonil 1.5 pt | Chlorothalonil 1.5 pt |
| PROVOST 10.7 oz       | PROVOST 10.7 oz       | PROVOST 10.7 oz       | PROVOST 10.7 oz       | PROVOST 10.7 oz       |
| 28 Days               | 21 Days               | 21 Days               | 14 Days               | 14 Days               |

See reverse side to assess your Peanut Disease Risk Index  
Fields with a history of or threat from *Cylindrocium Black Rot* (CBR) should use the Bayer CropScience CBR disease management program coupled with a CBR resistant peanut variety.

Programs developed through the cooperation of



PEANUT Rx, Bayer CropScience brand fungicides, and the only fungicides that may be used in a grower program to qualify for the Bayer CropScience standard product performance protection.

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## Assess Disease Risk in Your Field and Develop a Peanut Rx

This worksheet will lead you through the four-step process to determine your disease risk level and then customize a Peanut Rx™ for your individual field using the reverse side of this worksheet and with the assistance of your Syngenta representative.



For each of the risk index factors, identify which option best describes the situation for your field, and add the index value associated with each choice to obtain your overall disease risk value. This worksheet does not contain all of the varieties included in the 2007 Peanut Rx or the notes that accompany each factor. To view the complete 2007 Peanut Rx, visit the University of Georgia peanut Web site at [www.uga-peanuts.com](http://www.uga-peanuts.com).

### Step 1: Assess Your Disease Risk

| Variety Selection |                     |                  |                           |         |
|-------------------|---------------------|------------------|---------------------------|---------|
| Variety           | Spotted Wilt Points | Leaf Spot Points | Soil-borne Disease Points |         |
| Georgia Green     | 30                  | 20               | 20                        | 15      |
| Audubon II        | 25                  | 30               | 20                        | 25      |
| C-9912            | 20                  | 15               | 15                        | 25      |
| Carver            | 20                  | 20               | 20                        | 25      |
| AT 3061B          | 25                  | Unknown          | Unknown                   | Unknown |
| Georgia-03L       | 15                  | 15               | 10                        | 20      |
| Georgia-02C       | 15                  | 20               | 10                        | 20      |
| Georgia-01R       | 10                  | 10               | 15                        | 15      |
| York              | 10                  | 10               | 10                        | Unknown |
| AP-3              | 10                  | 25               | 10                        | 25      |
| Georgia-05E       | 15                  | 20               | 25                        | Unknown |
| Florida-07        | 10                  | 20               | 15                        | Unknown |
| Titrunner         | 10                  | 15               | 25                        | 25      |

| Planting Date        |                     |                  |                           |   |
|----------------------|---------------------|------------------|---------------------------|---|
| Peanuts are planted: | Spotted Wilt Points | Leaf Spot Points | Soil-borne Disease Points |   |
| Prior to May 1       | 30                  | 0                | 5                         | 0 |
| May 1 to May 10      | 15                  | 0                | 5                         | 0 |
| May 11 to May 31     | 5                   | 5                | 0                         | 0 |
| June 1 to June 10    | 10                  | 5                | 0                         | 5 |
| After June 10        | 20                  | 10               | 0                         | 5 |

| Plant Population (final stand, not seeding rate) |                     |                  |                           |    |
|--|---------------------|------------------|---------------------------|----|
| Peanuts are planted in:                          | Spotted Wilt Points | Leaf Spot Points | Soil-borne Disease Points |    |
| Less than 3 plants per ft.                       | 25                  | NA               | NA                        | NA |
| 3 to 4 plants per ft.                            | 15                  | NA               | NA                        | NA |
| More than 4 plants per ft.                       | 5                   | NA               | NA                        | NA |

| At-Plant Insecticide                  |                     |                  |                           |    |
|---------------------------------------|---------------------|------------------|---------------------------|----|
| Insecticide used                      | Spotted Wilt Points | Leaf Spot Points | Soil-borne Disease Points |    |
| None                                  | 15                  | NA               | NA                        | NA |
| Other than Thimet® 20G or Phorate 20G | 15                  | NA               | NA                        | NA |
| Thimet 20G, Phorate 20G               | 5                   | NA               | NA                        | NA |

| Row Pattern             |                     |                  |                           |   |
|-------------------------|---------------------|------------------|---------------------------|---|
| Peanuts are planted in: | Spotted Wilt Points | Leaf Spot Points | Soil-borne Disease Points |   |
| Single rows             | 15                  | 0                | 5                         | 0 |
| Twin rows               | 5                   | 0                | 0                         | 0 |

| Tillage      |                     |                  |                           |   |
|--------------|---------------------|------------------|---------------------------|---|
| Tillage      | Spotted Wilt Points | Leaf Spot Points | Soil-borne Disease Points |   |
| Conventional | 15                  | 10               | 0                         | 0 |
| Reduced      | 5                   | 0                | 0                         | 5 |

| Classic® Herbicide      |                     |                  |                           |    |
|-------------------------|---------------------|------------------|---------------------------|----|
| Classic herbicide usage | Spotted Wilt Points | Leaf Spot Points | Soil-borne Disease Points |    |
| Classic applied         | 5                   | NA               | NA                        | NA |
| No Classic applied      | 0                   | NA               | NA                        | NA |

| Crop Rotation (with a non-legume crop) |                     |                  |                           |    |
|--|---------------------|------------------|---------------------------|----|
| Years between peanut crop              | Spotted Wilt Points | Leaf Spot Points | Soil-borne Disease Points |    |
| 0                                      | NA                  | 25               | 25                        | 20 |
| 1                                      | NA                  | 15               | 20                        | 15 |
| 2                                      | NA                  | 10               | 10                        | 10 |
| 3 or more                              | NA                  | 5                | 5                         | 5  |

| Field History                                      |                     |                  |                           |    |
|--|---------------------|------------------|---------------------------|----|
| Have you had a problem controlling these diseases? | Spotted Wilt Points | Leaf Spot Points | Soil-borne Disease Points |    |
| No   | NA                  | 0                | 0                         | 0  |
| Yes  | NA                  | 10               | 15                        | 10 |

| Irrigation                         |                     |                  |                           |    |
|------------------------------------|---------------------|------------------|---------------------------|----|
| Does the field receive irrigation? | Spotted Wilt Points | Leaf Spot Points | Soil-borne Disease Points |    |
| No                                 | NA                  | 0                | 0                         | 0  |
| Yes                                | NA                  | 10               | 5                         | 10 |

### Step 2: Calculate Your Severity Points

Fill in the following table to calculate your severity points for each of the four major peanut diseases given the 10 determining factors. Total each column in order to establish your disease index values.

|                         | Spotted Wilt | Leaf Spot | White Mold | Rhizoctonia Limb Rot |
|-------------------------|--------------|-----------|------------|----------------------|
| Variety                 |              |           |            |                      |
| Planting Date           |              |           |            |                      |
| Plant Population        |              |           |            |                      |
| At-Plant Insecticide    |              |           |            |                      |
| Row Pattern             |              |           |            |                      |
| Tillage                 |              |           |            |                      |
| Classic Herbicide       |              |           |            |                      |
| Crop Rotation           |              |           |            |                      |
| Field History           |              |           |            |                      |
| Irrigation              |              |           |            |                      |
| Your Total Index Values |              |           |            |                      |

### Step 3: Interpret Your Index Values

Once you've calculated your index values, utilize the following information to interpret your risk level situation.

|               | Spotted Wilt | Leaf Spot | White Mold | Rhizoctonia Limb Rot |
|---------------|--------------|-----------|------------|----------------------|
| Low Risk      | < 85         | 10-35     | 10-25      | 15-25                |
| Moderate Risk | 70-110       | 40-60     | 30-50      | 30-40                |
| High Risk     | > 115        | 65-100    | 55-80      | 45-75                |

In a year when tomato spotted wilt virus incidence is high statewide, even fields with a low risk level may experience significant losses. Consider the following recommendations to reduce your spotted wilt risk level:

- Use less susceptible varieties.
- Adjust your planting date.
- Consult the complete Peanut Rx for additional options that may also provide limited benefit.

### Step 4: Develop Your Peanut Rx

Syngenta Crop Protection has joined forces with the authors of the Peanut Disease Risk Index to minimize disease risk and establish season-long fungicide spray programs for growers at every risk level. Syngenta recommended fungicide spray programs for each risk level are included on the reverse side. Once you have calculated your total risk for each fungal disease, utilize the most conservative fungicide program as your guide for customizing a per-field prescription spray program with the assistance of your Syngenta representative.

Programs developed through the cooperation of



THE UNIVERSITY OF GEORGIA  
COLLEGE OF AGRICULTURAL & ENVIRONMENTAL SCIENCES





# Diseases and Nematodes

## The take-away points



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- Peanut production in Georgia is threatened by a number of important diseases and plant-parasitic nematodes. (For today, five + one to be considered)
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