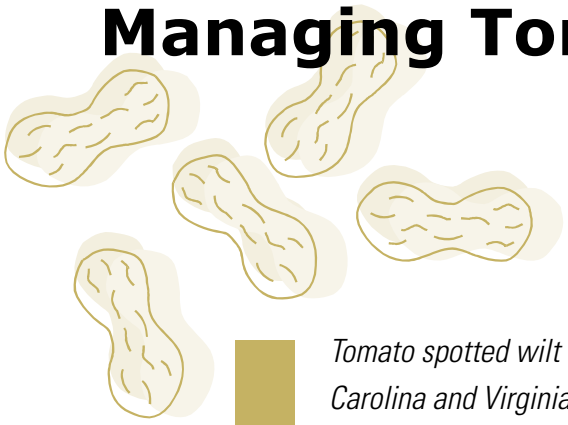
Managing Tomato Spotted Wilt Virus in Peanuts

in North Carolina and Virginia



Tomato spotted wilt virus (TSWV) has become a major pest in peanut and other crops in North Carolina and Virginia over the past few years. Incidence and damage in peanuts was the highest in recorded history in both states during 2002. Research is underway to develop strategies to deal with this virus on peanuts. While this Advisory will not tell you how much tomato spotted wilt virus you will have in a particular field, it will help you select and implement practices that minimize damage from TSWV.

Facts About Tomato Spotted Wilt Virus in Peanuts

- Thrips transmit the virus when they feed on peanut plants. Although most of the virus is transmitted early in the season when thrips are most abundant, thrips can transmit the virus throughout the season. Because thrips can transmit the virus more rapidly than insecticides can kill them, even plants with very little thrips damage often are infected with the virus.
- A wide range of plants, both crops and weeds, host the virus and the thrips that transmit the virus. Thrips acquire the virus by feeding on infected host plants. Thrips feed and overwinter in and among many plants. In the spring, while peanut plants are emerging, the thrips move into fields, feeding on peanut plants and transmitting disease.
- Efforts to kill all of the vegetation adjacent to peanut fields may not reduce virus in peanuts. Thrips can enter fields from great distances. Depending on wind currents and weather patterns, it is suspected that thrips from many miles away can land and feed on peanut and subsequently transmit the virus.
- No control practices can be implemented to reduce virus after peanuts are planted. The major factors that influence the level of virus in peanut, including variety selection, planting date, plant population, in-furrow insecticide choice, row pattern, and tillage system. These factors are considered and implemented prior to planting.
- Poor and inconsistent emergence of peanuts and establishment of spotty peanut stands increase incidence of TSWV regardless of variety selection, planting date, insecticide choice, and tillage system. Establishing optimum plant stands is critical in managing this pest.
- An insect management program that effectively controls thrips will lower the amount of TSWV.
- Considerable variation in response to management strategies occurs and should be expected. Weather conditions that influence thrips populations and subsequent arrival in fields can vary considerably from year to year. Variation in strains of the virus and its ability to adapt also contribute to variation in response. The biology of thrips and virus as related to infection remains poorly understood.

NC STATE UNIVERSITY
A&T STATE UNIVERSITY
COOPERATIVE EXTENSION
Helping People Put Knowledge to Work

Advisory Index for Managing TSWV

Peanut Variety[1]

Perry, NC 9, NC 7, NC 12C[2] 40
VA 98R, Wilson 30
Gregory[2], NC-V 11, Georgia Green, C99R 20

[1]Georgia Green and C 99R are runner-market types. All other varieties are Virginia-market types.
[2]Gregory and NC 12C vary in response to TSWV. Poor emergence, and erratic and spotty stand have a major impact on development of TSWV. Peanut emergence in large-seeded varieties may be inconsistent. Low planting rates or poor emergence may negate any benefits of partial resistance to TSWV.

Planting Date[3]

Prior to May 5 20
May 6 to15 10
After May 15 15

[3]In absence of TSWV, higher yields are often obtained when peanuts are planted prior to May 15. Crop maturity can be affected by many factors. Planting a late-maturing variety, such as Perry, in late May to minimize spotted wilt may result in lower yields and market grades because pods do not have sufficient time and heat units to mature.

Plant Population (actual stand—not projected stand)[4]

2 or less plants per linear foot of row 25
3 to 4 plants per linear foot of row 15
5 or more plants per linear foot of row 5

[4]Consider seed size and count per pound when planting Virginia market-type peanuts. The varieties and seeding rates in pounds per acre (listed in parentheses) needed to establish a plant population of 4 plants per row foot ***assuming 80 percent germination (planting 5 seeds per linear foot of row to get 4 plants per linear foot of row)****: NC-V 11 (116 lb/acre), NC 9 (121 lb/acre), VA 98R (126 lb/acre), Perry (138 lb/acre), NC 12C (158 lb/acre), Gregory (161 lb/acre), Georgia Green (85 lb/acre), and C 99R (108 lb/acre). Actual seed count and germination can vary from year to year and lot to lot. Consider the characteristics of the peanut seed you have purchased when setting your planter. For twin rows, final plant population for liner foot of row is the sum of individual twin rows.*

In-furrow Insecticide/Nematicide[5,6]

None 20
Temik 15G or Orthene 10
Thimet 20G or Phorate 20G 5

[5]The influence of insecticide on TSWV should not be the overriding consideration for selection. Consider effectiveness against thrips, injury potential from insecticides, cost of treatment, and possible interactions of insecticides with herbicides.
[6]If Thimet 20G, Phorate 20G, or Orthene is applied, you will lose the nematode suppression provided by Temik 15G. While Orthene applied postemergence controls thrips, it is less effective in controlling TSWV than applying Orthene in-furrow.

Tillage[7]

Conventional tillage 10
Strip tillage into killed cover crop or previous crop residue 5

[7]Research has shown lower average yields when peanuts are seeded into stubble from the previous crop. Establishing beds in the fall and seeding a cover crop and then strip tilling peanut into the killed cover crop has been the most effective reduced-tillage system with yields similar to yields in conventional tillage systems. Yield potential has been more difficult to maintain on finer-textured soils with little or no bed when peanuts are strip tilled into the stubble from the previous crop. The decision to move into reduced tillage exclusively to manage tomato spotted wilt virus must be considered carefully.

Determining the Risk of Your Field

Peanut Variety

Your score ..... _____

Planting Date

Your score ..... _____

Plant Population

Your score ..... _____

In-furrow Insecticide

Your score ..... _____

Tillage

Your score ..... _____

Total Index Value ..... _____

Examples of the Advisory Index

All management options designed to minimize TSWV:

Plant the variety Gregory (20) after May 5 but before May 15 (10) in strip tillage (5) at a plant population of 5 plants per row foot (5) using Thimet 20G in-furrow (5).

Advisory Index = 45 (Low Risk)

No management options designed to minimize tomato spotted wilt virus:

Plant the variety Perry (40) before May 5 (20) in conventional tillage (10) at a plant population of 2 plants per row foot (25) using no in-furrow insecticide (20).

Advisory Index = 115 (High Risk)

Compromise situation: Finer-textured soil with history of Sclerotinia blight and CBR:

Plant the variety Perry (40) between May 6 and 15 (10) in conventional tillage (10) at a plant population of 5 plants per foot of row (5) using Phorate 20G in-furrow (5).

Advisory Index = 70 (Moderate Risk)

Compromise situation: Coarse-textured soil with history of Sclerotinia blight, no CBR, and light population of nematodes in the extreme northern range of Virginia production:

Plant the variety VA 98R (30) prior to May 5 (20) in strip tillage (5) at a plant population of 5 plants per foot of row (5) using Temik 15G in-furrow (10).

Advisory Index = 75 (Moderate Risk)

Some production practices can be incorporated with no additional equipment investment. These include planting date, variety selection, seeding rate, and insecticide selection. Planting peanut in twin rows or in reduced tillage systems may require equipment purchase. Consider the strengths and weaknesses of each input when developing a TSWV management program. Contact your local Cooperative Extension agent, and check *2003 Peanut Information* (North Carolina Cooperative Extension Service AG-331), and *2003 Virginia Peanut Production Guide* (Tidewater Agricultural Research and Extension Center Information Series No. 451) for additional information on developing pest management and production systems.

Point Range of 45 to 115
60 or Less Low Risk
65 to 85 Moderate Risk
90 or More High Risk

Recommendations for the use of chemicals are included in this publication as a convenience to the reader. The use of brand names and any mention or listing of commercial products or services in this publication does not imply endorsement by North Carolina State University, North Carolina A&T State University or North Carolina Cooperative Extension nor discrimination against similar products or services not mentioned. Individuals who use chemicals are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Be sure to obtain current information about usage regulations and examine a current product label before applying any chemical.
For assistance, contact an agent of North Carolina Cooperative Extension.

This Advisory Index for Managing Tomato Spotted Wilt Virus in North Carolina Peanuts and Virginia was closely patterned after The University of Georgia *Tomato Spotted Wilt Virus Index for Peanuts* (The University of Georgia, College of Agricultural and Environmental Sciences, Bulletin 1165R, Revised January, 2002).

Prepared by
Christie Hurt, Graduate Research Assistant; Rick Brandenburg, Extension Entomologist; David Jordan, Extension Agronomist; Barbara Shew, Extension Plant Pathologist; Tom Isleib, Crop Science Professor and peanut breeder; and Mike Linker, IPM Coordinator, North Carolina State University
and
Ames Herbert, Extension Entomologist and IPM Coordinator; Pat Phipps, Extension Plant Pathologist; Charles Swann, Extension Peanut Specialist; and Walt Mozingo, Professor and Coordinator of the Peanut Variety and Quality Evaluation Program, Tidewater Agricultural Research and Extension Center, Virginia Polytechnic Institute and State University

1,500 copies of this public document were printed at a cost of $746.33 or $.50 cents per copy.

Published by
NORTH CAROLINA COOPERATIVE EXTENSION SERVICE

5/03—1.5M—JG/SSS AG-638

E03-42844